A330

AEROLINEAS
ARGENTINAS

FLIGHT CREW OPERATING MANUAL

REFERENCE: ARG A330 FLEET FCOM

ISSUE DATE: 21 FEB 24

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AEROLINEAS ARGENTINAS **A330** FLIGHT CREW OPERATING MANUAL	**TRANSMITTAL LETTER**

Issue date: 21 FEB 24

This is the FLIGHT CREW OPERATING MANUAL at issue date 21 FEB 24 for the A330 and replacing last issue dated 28 NOV 23

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FILING INSTRUCTIONS

Please incorporate this revision as follow:

Localization Subsection Title	Remove	Insert Rev. Date
PLP-LESS **LIST OF EFFECTIVE SECTIONS/SUBSECTIONS**	ALL	21 FEB 24
PLP-LOM **LIST OF MODIFICATIONS**	ALL	21 FEB 24
PLP-SOH **SUMMARY OF HIGHLIGHTS**	ALL	21 FEB 24
GEN-PLP-TOC **TABLE OF CONTENTS**	ALL	21 FEB 24
GEN-PLP-SOH **SUMMARY OF HIGHLIGHTS**	ALL	21 FEB 24
GEN **General Information**	ALL	21 FEB 24
DSC-PLP-LEDU **LIST OF EFFECTIVE DOCUMENTARY UNITS**	ALL	21 FEB 24
DSC-20-PLP-SOH **SUMMARY OF HIGHLIGHTS**	ALL	21 FEB 24
DSC-20-30 **Ground Handling**	ALL	21 FEB 24
DSC-22_20-PLP-TOC **TABLE OF CONTENTS**	ALL	21 FEB 24
DSC-22_20-PLP-SOH **SUMMARY OF HIGHLIGHTS**	ALL	21 FEB 24
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DSC-32-20-10 **Description**	ALL	21 FEB 24
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PRO-ABN-ENG **ENG**	ALL	21 FEB 24
PRO-ABN-F_CTL **F/CTL**	ALL	21 FEB 24
TAB-PLP-TOC **TABLE OF CONTENTS**	ALL	21 FEB 24
TAB-PLP-SOH **SUMMARY OF HIGHLIGHTS**	ALL	21 FEB 24
TAB **Temporary Abnormal Behaviors**	ALL	21 FEB 24

PRELIMINARY PAGES

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	DSC-22_10-40-50	**Navigation Display**	04 OCT 21
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E	DSC-32-20-20	**Controls and Indicators**	21 FEB 24
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	DSC-32-30-20	**Controls and Indicators**	04 OCT 21
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	DSC-34-10-20	**Standby Instruments**	16 MAY 23
	DSC-34-10-30-10	**Tuning**	04 OCT 21
	DSC-34-10-30-20	**Navaids**	28 NOV 23
	DSC-34-10-30-30	**Controls and Indicators**	28 NOV 23
	DSC-34-10-40-10	**Description**	04 OCT 21
	DSC-34-20-10-10	**Description**	13 MAY 20

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M[(1)]	Localization	Subsection Title	Rev. Date
	DSC-34-20-10-20	**Controls and Indicators**	16 MAY 23
	DSC-34-20-10-30	**Remote ATC Box**	04 OCT 21
	DSC-34-20-30-10	**Description**	16 MAY 23
	DSC-34-20-30-20	**Predictive Windshear System**	16 MAY 23
	DSC-34-20-30-30	**Controls and Indicators**	16 MAY 23
	DSC-34-20-40-10	**Description**	04 OCT 21
	DSC-34-20-40-20	**GPWS Basic Modes**	04 OCT 21
	DSC-34-20-40-30	**Predictive GPWS Functions**	28 NOV 23
	DSC-34-20-40-40	**Controls and Indicators**	16 MAY 23
	DSC-34-20-50-10	**General**	04 OCT 21
	DSC-34-20-50-20	**Description**	16 NOV 22
	DSC-34-20-50-30	**Controls and Indicators**	16 MAY 23
	DSC-34-20-60-10	**Description**	24 MAY 22
	DSC-34-20-60-20	**Controls and Indicators**	28 NOV 23
	DSC-35-10	**General**	04 OCT 21
	DSC-35-20-10	**Description**	16 NOV 22
	DSC-35-20-20	**Controls and Indicators**	04 OCT 21
	DSC-35-20-30	**How to**	04 OCT 21
	DSC-35-30-10	**Description**	04 OCT 21
	DSC-35-30-20	**Controls and Indicators**	04 OCT 21
	DSC-35-40-10	**Description**	16 MAY 23
	DSC-36-10-10	**General**	16 MAY 23
	DSC-36-10-20	**Engine Bleed System**	16 MAY 23
	DSC-36-10-30	**APU Bleed Air Supply**	04 OCT 21
	DSC-36-10-40	**HP Ground Air Supply**	04 OCT 21
	DSC-36-10-50	**Crossbleed**	04 OCT 21
	DSC-36-10-60	**Leak Detection**	16 MAY 23
	DSC-36-10-70	**Operation Following Failures**	16 MAY 23
	DSC-36-20	**Controls and Indicators**	04 OCT 21
	DSC-38-10	**Description**	16 NOV 22
	DSC-45-10	**Description**	16 MAY 23
	DSC-45-20	**System Operation**	04 OCT 21
	DSC-45-30	**Data Loader**	04 OCT 21
	DSC-45-35	**Printer**	04 OCT 21
	DSC-46-10-10	**General System Description**	16 MAY 23
	DSC-46-10-20-10	**General**	04 OCT 21
	DSC-46-10-30-10	**Notifications**	04 OCT 21
	DSC-46-10-30-20	**Controller/Pilot Datalink Communication (CPDLC)**	16 MAY 23
	DSC-46-10-30-30	**Automatic Dependent Surveillance-Contract (ADS-C)**	16 MAY 23

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M[1]	Localization	Subsection Title	Rev. Date
	DSC-46-10-30-40	**Departure Clearance (DCL)**	16 MAY 23
	DSC-46-10-30-50	**Oceanic Clearance (OCL)**	16 MAY 23
	DSC-46-10-30-60	**Digital-Automatic Terminal Information System (D-ATIS)**	16 MAY 23
	DSC-46-10-30-70	**Message Record**	16 MAY 23
	DSC-46-10-40-10	**ATC Message Pushbutton (ATC MSG PB)**	04 OCT 21
	DSC-46-10-40-20	**Datalink Control and Display Unit (DCDU)**	16 MAY 23
	DSC-46-10-40-30	**MCDU Datalink Pages**	16 MAY 23
	DSC-46-10-40-40	**MCDU Scratchpad Messages**	16 MAY 23
	DSC-46-10-40-50	**MCDU Data Entry Format**	16 MAY 23
	DSC-46-10-40-60	**ECAM**	04 OCT 21
	DSC-46-10-50	**How To**	16 MAY 23
	DSC-46-10-100	**Temporary Abnormal Behaviors**	04 OCT 21
	DSC-46-20	**Aircraft Information Network System (AINS)**	04 OCT 21
	DSC-46-40	**EFB**	04 OCT 21
	DSC-49-10-10	**General**	04 OCT 21
	DSC-49-10-20	**Main Components**	04 OCT 21
	DSC-49-20	**Controls and Indicators**	04 OCT 21
	DSC-52-10-10	**General**	04 OCT 21
	DSC-52-10-20	**Passengers Doors**	28 NOV 23
	DSC-52-10-30	**Emergency Exits**	04 OCT 21
	DSC-52-10-40	**Cargo Doors**	16 MAY 23
	DSC-52-10-42	**Lower Deck Cargo Doors**	04 OCT 21
	DSC-52-10-50	**Avionics Compartment Access Door**	04 OCT 21
	DSC-52-10-70	**Escape Slides/Rafts**	04 OCT 21
	DSC-52-10-80	**Doors and Slides Control System**	04 OCT 21
	DSC-52-20	**Controls and Indicators**	04 OCT 21
	DSC-52-30-10	**Description**	16 MAY 23
	DSC-52-30-20	**Cockpit Door Locking System (CDLS)**	16 MAY 23
	DSC-52-30-30	**Cockpit Door Surveillance System (CDSS)**	16 MAY 23
	DSC-52-40	**How to**	04 OCT 21
	DSC-52-100	**Temporary Abnormal Behavior**	04 OCT 21
	DSC-56-10	**General**	04 OCT 21
	DSC-56-20	**Fixed Windows**	04 OCT 21
	DSC-56-30	**Sliding Windows**	04 OCT 21
	DSC-56-40	**Description**	04 OCT 21
	DSC-70-05	**Overview**	16 MAY 23
	DSC-70-10-10	**Engine**	16 MAY 23
	DSC-70-20	**FADEC**	16 MAY 23
	DSC-70-30-10	**General**	15 FEB 23

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M(1)	Localization	Subsection Title	Rev. Date
	DSC-70-30-30	**Thrust Levers**	15 FEB 23
	DSC-70-30-40	**Thrust Rating Limit**	15 FEB 23
	DSC-70-35-10	**General**	16 MAY 23
	DSC-70-35-20	**Engine Power Setting**	16 MAY 23
	DSC-70-35-30	**Thrust Levers**	16 MAY 23
	DSC-70-35-40	**Thrust Rating Limit**	16 MAY 23
	DSC-70-35-50	**Thrust Control**	16 MAY 23
	DSC-70-40-10	**General**	16 MAY 23
	DSC-70-40-20	**Fuel Pump Unit / Main Engine Pump**	16 MAY 23
	DSC-70-40-30	**Shutoff Valves**	16 MAY 23
	DSC-70-40-40	**Hydromechanical Unit / Fuel Metering Unit**	16 MAY 23
	DSC-70-40-50	**IDG Oil Cooling System**	15 FEB 23
	DSC-70-50	**Oil System**	16 MAY 23
	DSC-70-60	**Airbleed System**	16 MAY 23
	DSC-70-70	**Thrust Reverser System**	16 MAY 23
	DSC-70-80-10	**General**	04 OCT 21
	DSC-70-80-20	**Ignition System**	16 MAY 23
	DSC-70-80-30	**Engine Starting System**	16 MAY 23
	DSC-70-80-40	**Alternate Start/Ignition Information**	04 OCT 21
	DSC-70-90-10	**Overhead Panel**	16 MAY 23
	DSC-70-90-20	**Pedestal**	24 MAY 22
	DSC-70-90-30	**Maintenance Panel**	04 OCT 21
	DSC-70-90-40	**Engine Display**	28 NOV 23
	DSC-70-100	**Temporary Abnormal Behaviors**	04 OCT 21
	PRO-PLP-LETDU	**LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS**	28 NOV 23
	PRO-ABN-ABN-00	**INTRODUCTION**	28 NOV 23
	PRO-ABN-ABN-ADV	**[ADV] ECAM ADVISORY**	16 MAY 23
	PRO-ABN-ABN-MEM	**[MEM] MEMORY ITEMS**	24 MAY 22
	PRO-ABN-ABN-QRH	**[QRH] PROCEDURES**	16 MAY 23
R	PRO-ABN-ABN-RST	**[RESET] SYSTEM RESET**	21 FEB 24
	PRO-ABN-A-ICE	**A-ICE**	16 MAY 23
	PRO-ABN-AIR	**AIR**	23 AUG 23
	PRO-ABN-APU	**APU**	24 MAY 22
	PRO-ABN-APUF	**APU FIRE**	04 OCT 21
	PRO-ABN-AUTO_FLT	**AUTO FLT**	16 MAY 23
E	PRO-ABN-BRAKES	**BRAKES**	21 FEB 24
	PRO-ABN-CAB_PR	**CAB PR**	28 NOV 23
	PRO-ABN-COM	**COM**	04 OCT 21
	PRO-ABN-COND	**COND**	16 MAY 23

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M[(1)]	Localization	Subsection Title	Rev. Date
	PRO-ABN-CONFIG	**CONFIG**	24 MAY 22
	PRO-ABN-DATALINK	**DATALINK**	04 OCT 21
	PRO-ABN-DOOR	**DOOR**	16 MAY 23
	PRO-ABN-EIS	**EIS**	16 MAY 23
	PRO-ABN-ELEC	**ELEC**	28 NOV 23
R	PRO-ABN-ENG	**ENG**	21 FEB 24
R	PRO-ABN-F_CTL	**F/CTL**	21 FEB 24
	PRO-ABN-FUEL	**FUEL**	16 MAY 23
	PRO-ABN-FWS	**FWS**	04 OCT 21
	PRO-ABN-HYD	**HYD**	23 AUG 23
	PRO-ABN-LG	**L/G**	16 MAY 23
	PRO-ABN-MISC	**MISC**	16 MAY 23
	PRO-ABN-NAV	**NAV**	28 NOV 23
	PRO-ABN-OVERSPEED	**OVERSPEED**	04 OCT 21
	PRO-ABN-RECORDER	**RECORDER**	16 MAY 23
	PRO-ABN-SEVERE_ICE	**SEVERE ICE**	04 OCT 21
	PRO-ABN-SMOKE	**SMOKE**	28 NOV 23
	PRO-ABN-SURV	**SURV**	16 MAY 23
	PRO-ABN-T-O	**T.O**	17 AUG 22
	PRO-ABN-VENT	**VENT**	28 NOV 23
	PRO-ABN-WHEEL	**WHEEL**	04 OCT 21
	PRO-ABN-90	**Detailed Cabin / Cockpit Evacuation Procedure**	23 NOV 21
	PRO-NOR-SOP-01	**General Information**	04 OCT 21
	PRO-NOR-SOP-02	**Flight Preparation**	28 NOV 23
	PRO-NOR-SOP-03	**Safety Exterior Inspection**	24 MAY 22
	PRO-NOR-SOP-04	**Preliminary Cockpit Preparation**	28 NOV 23
	PRO-NOR-SOP-05	**Exterior Walkaround**	28 NOV 23
	PRO-NOR-SOP-06	**Cockpit Preparation**	28 NOV 23
	PRO-NOR-SOP-07	**Before Pushback or Start**	28 NOV 23
	PRO-NOR-SOP-08	**Engine Start**	16 MAY 23
	PRO-NOR-SOP-09	**After Start**	28 NOV 23
	PRO-NOR-SOP-10	**Taxi**	28 NOV 23
	PRO-NOR-SOP-10B	**Departure Change**	23 NOV 21
	PRO-NOR-SOP-11	**Before Takeoff**	28 NOV 23
	PRO-NOR-SOP-12	**Takeoff**	28 NOV 23
	PRO-NOR-SOP-13	**After Takeoff**	23 NOV 21
	PRO-NOR-SOP-14	**Climb**	28 NOV 23
	PRO-NOR-SOP-15	**Cruise**	28 NOV 23
	PRO-NOR-SOP-16	**Descent Preparation**	28 NOV 23

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M(1)	Localization	Subsection Title	Rev. Date
	PRO-NOR-SOP-17	**Descent**	28 NOV 23
	PRO-NOR-SOP-18-A	**Approach General**	28 NOV 23
	PRO-NOR-SOP-18-B	**Aircraft Configuration Management**	28 NOV 23
	PRO-NOR-SOP-18-C	**Aircraft Guidance Management**	28 NOV 23
	PRO-NOR-SOP-19	**Landing**	28 NOV 23
	PRO-NOR-SOP-20	**Go Around**	28 NOV 23
	PRO-NOR-SOP-21	**After Landing**	16 MAY 23
	PRO-NOR-SOP-22	**Parking**	28 NOV 23
	PRO-NOR-SOP-23	**Securing the Aircraft**	28 NOV 23
	PRO-NOR-SCO	**Standard Callouts**	28 NOV 23
	PRO-NOR-TSK	**Tasksharing**	28 NOV 23
	PRO-NOR-SUP-SUP	**Supplementary Procedures Menu**	16 MAY 23
	PRO-NOR-SUP-ADVWXR	**Adverse Weather**	16 MAY 23
	PRO-NOR-SUP-ENG	**Engines**	16 MAY 23
	PRO-NOR-SUP-FUEL	**Fuel**	28 NOV 23
	PRO-NOR-SUP-GPSINT	**GPS Interferences**	28 NOV 23
	PRO-NOR-SUP-LG-DN	**Flight With Landing Gear Down**	16 MAY 23
	PRO-NOR-SUP-LG-LG	**Operation with Nosewheel Steering Offset**	04 OCT 21
	PRO-NOR-SUP-MISC-C	**Flight without Cabin Pressurization**	16 MAY 23
	PRO-NOR-SUP-MISC-A	**High Altitude Airport Operations**	24 MAY 22
	PRO-NOR-SUP-MISC-B	**Operations at QNH above 1050 hPa**	16 MAY 23
	PRO-NOR-SUP-SURV	**Surveillance**	13 MAY 20
	PRO-NOR-SRP-01-05	**Introduction**	04 OCT 21
	PRO-NOR-SRP-01-10	**Cockpit Preparation**	16 MAY 23
	PRO-NOR-SRP-01-15	**Before Push Back or Start**	16 MAY 23
	PRO-NOR-SRP-01-20	**Taxi**	04 OCT 21
	PRO-NOR-SRP-01-30	**TAKEOFF**	04 OCT 21
	PRO-NOR-SRP-01-40	**Climb**	04 OCT 21
	PRO-NOR-SRP-01-50	**Cruise**	16 MAY 23
	PRO-NOR-SRP-01-60	**Descent**	04 OCT 21
	PRO-NOR-SRP-01-70	**Approach**	16 MAY 23
	PRO-NOR-SRP-01-80	**Go-Around**	16 MAY 23
	PRO-SPO-40A	**Extended Range Operations**	16 MAY 23
	PRO-SPO-42B-10	**General**	15 FEB 23
	PRO-SPO-42B-20	**Limitations**	15 FEB 23
	PRO-SPO-42C-10	**General**	16 MAY 23
	PRO-SPO-42C-20	**Limitations**	16 MAY 23
	PRO-SPO-50	**Reduced Vertical Separation Minimum - RVSM**	04 OCT 21
	PRO-SPO-51	**Performance-Based Navigation (PBN)**	28 NOV 23

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M[(1)]	Localization	Subsection Title	Rev. Date
	PRO-SPO-52	**Performance-Based Communication and Surveillance (PBCS)**	16 MAY 23
	PRO-SPO-85	**Simultaneous Parallel Approach Operations**	04 OCT 21
	LIM-PLP-LETDU	**LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS**	21 FEB 24
	LIM-INT	**Introduction**	04 OCT 21
	LIM-AG-F_CTL	**Flight Maneuvering Load Acceleration Limits**	04 OCT 21
	LIM-AG-OPS	**Operational Parameters**	16 MAY 23
	LIM-AG-SPD	**Speeds**	16 MAY 23
	LIM-AG-WGHT	**Weights**	16 MAY 23
	LIM-AIR	**Air Bleed/Cond/Press/Vent**	16 MAY 23
	LIM-AFS-10	**General**	16 MAY 23
	LIM-AFS-20	**Automatic Approach, Landing and Rollout**	28 NOV 23
	LIM-APU	**Auxiliary Power Unit**	04 OCT 21
	LIM-CAB	**Cabin Systems**	16 MAY 23
	LIM-COM	**Communications**	04 OCT 21
	LIM-ENG	**Engines**	16 MAY 23
	LIM-F_CTL	**Flight Controls**	04 OCT 21
	LIM-FUEL	**Fuel**	16 MAY 23
	LIM-ICE_RAIN	**Ice and Rain Protection**	04 OCT 21
	LIM-LG	**Landing Gear**	04 OCT 21
	LIM-NAV	**Navigation**	04 OCT 21
	LIM-OXY	**Oxygen**	16 MAY 23
	LIM-ROW_ROP	**ROW/ROP**	04 OCT 21
	LIM-SURV	**Surveillance**	04 OCT 21
	TAB-PLP-LETDU	**LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS**	21 FEB 24
R	TAB	**Temporary Abnormal Behaviors**	21 FEB 24
	EFB-PLP-LETDU	**LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS**	21 FEB 24
	EFB-THR-N1	**N1 MODE THRUST CONTROL**	16 MAY 23
	EFB-TOF-10	**Takeoff Performace Optimization**	28 NOV 23
	EFB-TOF-20-10	**Takeoff at Maximum Thrust**	04 OCT 21
	EFB-TOF-20-20-10	**General**	04 OCT 21
	EFB-TOF-20-20-20	**Flexible Takeoff**	16 MAY 23
	EFB-TOF-20-20-30	**Derated Takeoff (If Installed)**	04 OCT 21
	EFB-TOF-20-20-40	**Flexible Takeoff vs Derated Takeoff**	04 OCT 21
	EFB-TOF-30-10	**Takeoff on Dry Runway**	04 OCT 21
	EFB-TOF-30-20	**Takeoff on Wet Runways**	23 NOV 21
	EFB-TOF-30-30	**Takeoff on Contaminated Runway**	28 NOV 23
	EFB-TOF-40	**Takeoff with MEL or CDL Item**	04 OCT 21
	EFB-TOF-50	**Takeoff Recommendations**	04 OCT 21
	EFB-IFT-10	**In-Flight Performance Calculation**	04 OCT 21

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M[1]	Localization	Subsection Title	Rev. Date
	EFB-IFT-20-10-10	**General**	04 OCT 21
	EFB-IFT-20-10-20	**Climb Thrusts**	04 OCT 21
	EFB-IFT-20-20-10	**Speeds**	04 OCT 21
	EFB-IFT-20-20-20	**Altitude/Ceilings**	04 OCT 21
	EFB-IFT-20-30	**Descent**	04 OCT 21
	EFB-IFT-20-40	**Holding**	04 OCT 21
	EFB-IFT-30	**One Engine Inoperative Operations**	04 OCT 21
	EFB-LDG-10	**Landing Performance Calculation**	23 NOV 21
	EFB-LDG-20	**Landing Speeds and Distances Definitions**	23 NOV 21
	EFB-LDG-30	**Runway Conditions**	16 NOV 22
	EFB-LDG-40	**Dispatch Requirements**	23 NOV 21
	EFB-LDG-50	**In-Flight Performance Assessment**	23 NOV 21

(1) Evolution code : N=New, R=Revised, E=Effectivity, M=Moved

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PRELIMINARY PAGES

AIRCRAFT ALLOCATION TABLE

This table gives, for each delivered aircraft, the cross reference between:

- The Manufacturing Serial Number (MSN).
- The Fleet Serial Number (FSN) of the aircraft as known by AIRBUS S.A.S.
- The registration number of the aircraft as known by AIRBUS S.A.S.
- The aircraft model.

M(1)	MSN	FSN	Registration Number	Model
	0587		LV-GKO	330-203
	0634		LV-GKP	330-203
	0877		LV-KAN	330-202
	0899		LV-KAO	330-202
	1191		LV-KHT	330-243
	1223		LV-KHU	330-243
	1605		LV-FVH	330-202
	1623		LV-FVI	330-202
	1737		LV-GHQ	330-202
	1748		LV-GIF	330-202

(1) Evolution code : N=New, R=Revised

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	C10655	49-3029 01	30 OCT 14	AIRBORNE AUXILIARY POWER - UPDATE ELECTRIC CONTROL BOX (ECB) SOFTWARE OF APU 331-350
	Applicable to: ALL			
	D17250	21-4068 01	20 AUG 10	AIR CONDITIONING-VENTILATION OF FWD CARGO COMPARTMENT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D17251	21-4068 01	20 AUG 10	AIR CONDITIONING-TEMPERATURE CONTROL OF FWD C.C.
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D17253		20 AUG 10	AIR CONDITIONING-HEATING SYSTEM FOR LOWER DECK BULK C.C.
	Applicable to: ALL			
	D17856	33-4016 01	20 AUG 10	LOGO LIGHTS-MANUAL ON
	Applicable to: LV-GKO, LV-GKP			
	D17890		20 AUG 10	INSTALLATION OF STRUCTURAL PROVISIONS FOR CRC
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D18022		04 OCT 11	FIRE SUPPRESSION EXTENDED DURATION TO 240 MIN
	Applicable to: ALL			
	D18045		30 OCT 14	EVAC SYSTEM DELETION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	D18123	25-3623 01	20 AUG 10	INSTALLATION OF SYSTEM PROVISION FOR AN UNDERFLOOR CREW REST CONTAINER (BFE)
	Applicable to: ALL			
	D18217		20 AUG 10	INSTALLATION OF H.T.L. FIRE EXTINGUISHER IN CARGO COMPARTMENTS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	D18218		20 AUG 10	DUPLICATION OF NAVIGATION LIGHTS
	Applicable to: ALL			
	D18236		20 AUG 10	BFE UNDERFLOOR CREW REST COMPARTMENT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D18762		20 AUG 10	DOORS - CARGO COMP. DOOR HYDRAULIC SYSTEM - INTRODUCE MODIFIED ELECTRICAL (MANUAL) SELECTOR VALVE
	Applicable to: ALL			
	D19367	21-4018 01	20 AUG 10	AIR CONDITIONING - PRESSURE CONTROL AND MONITORING - IMPROVE LANDING FIELD ELEVATION SELECTOR (LFES)
	Applicable to: ALL			
	D19479		20 AUG 10	AIRBORNE AUXILIARY POWER -CONTROL AND MONITORING -INTRODUCE IMPROVED ECB -8
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	D19781		04 OCT 11	FLIGHT CONTROLS-RUDDER MECHANICAL CONTROL- REPLACE GLASS FIBER CONTROL ROD BY AN ALUMINIUM ALLOY ROD
	Applicable to: ALL			
	D19899	21-4038 01	20 AUG 10	AIR CONDITIONING-LWR DK CARGO COMPTVENTILATION AND COOLING (FWD AND AFT)-INTRODUCE COMMON VENTILATION CONTROLLER (602 STD)
	Applicable to: ALL			
	D40398		25 NOV 11	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - INTRODUCE NEW AND IMPROVED ECB
	Applicable to: ALL			
	D40534		25 NOV 11	AIR CONDITIONING-PRESSURE CONTROL AND MONITORING- INTRODUCE IMPROVED CABIN PRESSURE CONTROL SYSTEM (CABIN PRESSURE CONTROLLER)
	Applicable to: ALL			
	D40555		25 NOV 11	LIGHTS - CABIN EMERGENCY LIGHTING - INTRODUCE IMPROVED EPSU (FOR 115V-AC-SYSTEM)
	Applicable to: ALL			
	D40814		25 NOV 11	OXYGEN - PASSENGER OXYGEN SYSTEM - INTRODUCE IMPROVED O2 CONTAINER SERIES 15 MIN. FROM VENDOR DRAGER
	Applicable to: ALL			
	D41253		25 NOV 11	LIGHTS - CABIN EMERGENCY LIGHTING - INTRODUCE A NEW EPSU (FOR 6V-DC-SYSTEM)
	Applicable to: ALL			
	D41807		13 SEP 13	LIGHTS - GENERAL - CABIN EMERGENCY LIGHTING - INSTALL PHOTOLUMINISCENT ESCAPE PATH MARKING -FLOOR MOUNTED
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU			
R	D41829		01 AUG 13	COMMUNICATIONS - CIDS - PED SWITCH AT FAP FROM PC ELECTRICAL POWER SUPPLY
	Applicable to: LV-KAN, LV-KAO			
	D42265		25 NOV 11	AIR CONDITIONING - PACK CONTROL AND INDICATING - INTRODUCE PACK CONTROLLER P/N 977B0000-01
	Applicable to: ALL			

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M[(1)]	CRITERION	Linked SB	Incorp. Date	Title
	D42415		30 OCT 14	WATER/WASTE - TOILET SYSTEM - DELETE WASTE TANK BALANCING SYSTEM FOR TWO TANK VERSIONS
	Applicable to: ALL			
	D42587		30 OCT 14	FUSELAGE - GENERAL - REAR FUSELAGE - INTRODUCE CFRP PRESSURE BULKHEAD FRAME 80
	Applicable to: ALL			
	D42829		30 OCT 14	COMMUNICATIONS - GENERAL - BASIS PROVISIONS FOR IN FLIGHT ENTERTAINMENT SYSTEM A330/A340-200/300
	Applicable to: ALL			
	D42874		30 OCT 14	COMMUNICATIONS - GENERAL - ADAPTATION OF ATA 23 CABIN SYSTEMS FOR ENHANCED CABIN A330/A340-300.
	Applicable to: ALL			
	D42876		30 OCT 14	AIR CONDITIONING - GENERAL - ADAPT SYSTEM TO ENHANCED CABIN FOR BASIC AIRCRAFT (COMMON PART)
	Applicable to: ALL			
	D43046		17 MAY 16	EQUIPMENT/FURNISHING-PASSENGER COMPARTMENT SEATS- INTRODUCTION OF THE IN-SEAT POWER SUPPLY SYSTEM (ISPSS) 110V AC VENDOR K.I.D.
	Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU			
	D43105	25-3563 00	13 SEP 13	EQUIPMENT/FURNISHINGS-COCKPIT- INSTALL ELT (EMERGENCY LOCATOR TRANSMITTER) REMOTE CONTROL PANEL IN COCKPIT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	D43310		30 OCT 14	OXYGEN - PASSENGER OXYGEN - EXTEND DURATION OF CHEMICAL SUPPLY TO 22 MIN FOR A340-600
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKP			
	D43619		17 MAY 16	E/F COCKPIT INSTALL ELT REMOTE CONTROL PANEL IN COCKPIT SEXTANT
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	D44089		17 MAY 16	COMMUNICATIONS - CIDS - COCKPIT CREW TO CABIN CREW ALERTING SYSTEM
	Applicable to: LV-GKO, LV-GKP			
	D44099	25-3161 03 25-4181 02	30 OCT 14	EQUIPMENT/FURNISHINGS - PASSENGER COMPARTMENT- INTRODUCE A MODIFIED

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
				INTRUSION AND PENETRATION RESISTANCE COCKPIT DOOR
	Applicable to: ALL			
	D44183	33-3022 02	26 MAY 15	LIGHTS - WING AND ENGINE SCAN LIGHTING- SWITCHING PHILOSOPHY CHANGE
	Applicable to: ALL			
	D44340		04 OCT 21	EQUIPMENT/FURNISHINGS - PAX COMPARTMENT - INSTALL DAMPING DEVICES TO REDUCE THE NOISE BY DOOR SLAM
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D44341		30 OCT 14	EQUIPMENT/FURNISHINGS - PAX COMPARTMENT - INSTALL NOISE REDUCED CDLS (COCKPIT DOOR LOCK SYSTEM)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D44356		30 OCT 14	AIR CONDITIONING - AIR CONDITIONING (PACKS) - INTRODUCE NEW PACK -08 STANDARD
	Applicable to: ALL			
	D44363	25-3176 00 25-4194 00	30 OCT 14	EQUIPMENT/FURNISHINGS-PASSENGER COMPARTMENT- INSTALL A DECOMPRESSION PANEL IN COCKPIT DOOR FROM VENDOR RBE
	Applicable to: ALL			
	D44364		30 OCT 14	AIR CONDITIONING - PRESSURIZATION CONTROL - INSTALL ECAM INDICATION FOR 3RD SAFETY VALVE INTERIM SOLUTION
	Applicable to: ALL			
	D44428	27-3107 00	30 OCT 14	FLIGHT CONTROLS - SLAT/FLAP CONTROL COMPUTER (SFCC) - INTRODUCE MODIFIED SLAT/FLAP CONTROL COMPUTER (STANDARD -509)
	Applicable to: ALL			
	D44434		30 OCT 14	AIR CONDITIONING - LOWER DECK CARGO COMPARTMENT VENTILATION AND COOLING FWD, AFT AND BULK - INTRODUCE NEW VENTILATION CONTROLLER
	Applicable to: ALL			
	D44532	25-3215 03 25-4218 03	17 MAY 16	EQUIPMENT/FURNISHINGS-CURTAINS AND PARTITIONS CDLS STRIKE IMPROVEMENT FOR BETTER TOLERANCE CONTRIBUTING TO A/C ENVIROMENT AND INTERFACE
	Applicable to: LV-GKO, LV-GKP			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	D44567		30 OCT 14	OXYGEN - PASSENGER OXYGEN - INTRODUCE IMPROVED PASSENGER OXYGEN CONTAINER FOR CHEMICAL SYSTEM 15 MIN (DRAEGER, TYPE V/VI)
	Applicable to: ALL			
	D44690		30 OCT 14	EQUIPMENT/FURNISHINGS - CURTAINS AND PARTITIONS - INSTALL A MAXIMUM NOISE REDUCED COCKPIT DOOR LOCK SYSTEM (CDLS)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D44784		30 OCT 14	AIR CONDITIONING - PRESSURE CONTROL AND MONITORING - INTRODUCE RESIDUAL PRESSURE CONTROL UNIT (RPCU)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D44861		30 OCT 14	PNEUMATIC - LEAK DETECTION - INTRODUCE ADAPTED DUAL LOOP OVERHEAT DETECTION ON APU BLEED AIR DUCT FOR A330-200
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D44931		30 OCT 14	FLIGHT CONTROLS - SLAT/FLAP CONTROL COMPUTER - INTRODUCE REDESIGNED SLAT/FLAP CONTROL COMPUTER (SFCC)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D45482	25-3623 01	30 OCT 14	COMMUNICATION - CIDS - ADAPT LD-MCR PROVISIONS TO THE NEW CIDS STANDARD
	Applicable to: ALL			
	D45552	23-3115 12	17 MAY 16	COMMUNICATIONS - AUDIO AND VIDEO MONITORING - INSTALL A COCKPIT DOOR SURVEILLANCE SYSTEM (CDSS)
	Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU			
	D45580		30 OCT 14	E/F - CREW REST ROOM - INSTALL NEW AIR SUPPLY ROUTING FOR FLIGHT CREW REST COMPARTMENT ON ENHANCED CABIN (NWA04)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D45966		30 OCT 14	INDICATION/RECORDING SYSTEM - RECORDERS - INSTALLATION OF A FDIMU FOR A330 A/C
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D46066		30 OCT 14	COMMUNICATIONS - PASSENGER MUSIC ENTERTAINMENT - ADDITIONAL SWITCHES FOR REMOVAL OF ELECTRICAL POWER FROM THE IFE EQUIPMENT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			

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M[(1)]	CRITERION	Linked SB	Incorp. Date	Title
	D46190		30 OCT 14	AIR CONDITIONING - CABIN AIR DISTRIBUTION AND RECIRCULATION - INTRODUCE NEW VENTILATION CONTROLLER
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D46268		17 MAY 18	AIR CONDITIONING - PACKS - DELETION OF BYPASS VALV(BPV) AND RELEVANT DUCTING AND INTRODUCTION OF ALTERNATIVE TEMPERATURE CONTROL VALVE (TCV)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D46296		30 OCT 14	DOORS - DOOR AND ESCAPE SLIDE CONTROL SYSTEM - MODIFY CONTROLLER, SENSORS AND TARGETS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	D46337		23 MAY 19	AIR CONDITIONING - ESSURE CONTROL AND MONITORING - APT WIRING FOR INDEPENDENT MONITORING OF ALL THREE SAFETY VALVES BY SDAC
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D46615		17 MAY 18	AIR CONDITIONING - COCKPIT AND CABIN - TEMPERATURE CONTROL - INTRODUCE ZONE CONTROLLER C-05
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D46710		30 OCT 14	EQUIPMENT/FURNISHING - CURTAINS AND PARTITIONS- INTRODUCE IMPROVED DECOMPRESSION PANEL IN COCKPIT DOOR
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	D46880	21-3145 01	17 MAY 18	AIR CONDITIONING - PACK CONTROL AND INDICATING INTRODUCE NEW PACK CONTROLLER C-05 STANDARD
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D46913		30 OCT 14	FIRE PROTECTION - DETECTION - INSTALL AND ACTIVATETHE CIDS-BASED SMOKE DETECTION SYSTEM FOR BASIC A/C
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	D47582		30 OCT 14	OXYGEN - PASSENGER OXYGEN - INTRODUCE IMPROVED PASSENGER OXYGEN CONTAINER FOR CHEMICAL SYSTEM 22MIN. (TYPE V/VI DRAEGER)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKP			
	D47666		15 FEB 23	EQUIPMENT/FURNISHINGS-COCKPIT-COCKPIT DOOR PHASE 2 INSTALLATION OF A DEADBOLT
	Applicable to: LV-KHT, LV-KHU			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	D47724		30 OCT 14	COMMUNICATIONS-AUDIO AND VIDEO MONITORING -INSTALL A COCKPIT DOOR SURVEILLANCE SYSTEM ON SYSTEM DISPLAY (CDSS ON SD)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	D47954	23-3115 12	17 MAY 18	COMMUNICATIONS - ANTI HIJACK CAMERA MONITORING - REPLACE HINGE ASSEMBLY FOR CDSS LCD/SYSTEM CONTROLLER
	Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU			
	D49132		04 OCT 21	E/F - CREW REST ROOM (CABIN) - DEFINE SINGLE PILOT FCRC MODULE (SFE)
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	D49216		30 OCT 14	DOORS - COCKPIT DOOR RELEASE SYSTEM - ELECTRICAL BACKUP SYSTEM
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	D49762		04 OCT 21	COMMUNICATIONS - CIDS - PED - SIGNS INSTEAD OF NS SIGNS
	Applicable to: LV-KAN, LV-KAO			
	D50055		30 OCT 14	Oxygen - Passenger Oxygen - Adapt Wiring on Pass Info Relay (Socket) for Chemical Oxygen System
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	D50127		30 OCT 14	HYDRAULIC POWER - GREEN MAIN HYDRAULIC POWER - INTRODUCE NEW HSMU P/N WITH AUTO CLEARANCE OF GREEN RESERVOIR LOW LEVEL LATCH
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	D50824	27-3201 05	30 OCT 14	FLIGHT CONTROLS - FLAPS - INTRODUCE SFCC RESET FUNCTION IN THE COCKPIT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO			
	D51916		30 OCT 14	COMMUNICATIONS - PASSENGER MUSIC ENTERTAINMENT - REMOVE ADD. SWITCH FOR VCC IN THE COCKPIT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	H12043		04 OCT 21	FUEL-REFUEL/DEFUEL-INTRODUCE PANEL IN L.H. WING LEADING EDGE
	Applicable to: LV-KAN, LV-KAO			
	H12050		04 OCT 11	LANDING GEAR-NOSE AND MAIN-INSTALL TYRE PRESSURE INDICATING SYSTEM (TPIS)-
	Applicable to: ALL			
	H12051		01 AUG 13	FUEL-REFUEL COUPLING-INSTALL IN LEFT WING
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	H12195	28-4055 01	04 OCT 21	FUEL - REFUEL/DEFUEL SYSTEM - FUEL PRESELECTION FROM COCKPIT
	Applicable to: LV-KAN, LV-KAO			
	H12234		22 MAR 16	LANDING GEAR-WHEELS AND BRAKES-FIT GOODRICH COOLING FANS
	Applicable to: LV-GKO			
	H12331		25 NOV 11	LANDING GEAR-TPIS-INSTALL A LABINAL TYRE PRESSURE INDICATING SYSTEM ON GOODRICH NOSE WHEELS
	Applicable to: ALL			
	H12332		25 NOV 11	LANDING GEAR-TPIS-INSTALL A LABINAL TYRE PRESSURE INDICATING SYSTEM ON GOODRICH MAIN WHEELS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	H12338		15 FEB 23	LANDING GEAR - TPIS - INSTALL A LABINAL TYRE PRESSURE INDICATING SYSTEM ON BENDIX MAIN WHEELS
	Applicable to: LV-KHT, LV-KHU			
	H12532		22 MAR 16	LANDING GEAR-WHEELS AND BRAKES-FIT PRODUCTION STANDARD GOODRICH BRAKE FANS
	Applicable to: LV-GKO			
	H12719		20 AUG 10	FUEL-TRIM TRANSFER SYSTEM-FIT FORWARD TRANSFER PUMP IN THE TRIM HORIZONTAL STABILIZER
	Applicable to: ALL			
	H13038		25 NOV 11	LANDING GEAR-NOSE GEAR-INSTALL WIRING PROVISIONS FOR A TOWING ANGLE LIMIT WARNING SYSTEM.
	Applicable to: ALL			
	H13154		04 OCT 11	LANDING GEAR - MAIN GEAR - FIT STRENGTHENED MAIN LANDING GEAR FOR GROWTH A/C
	Applicable to: ALL			
	H13259		01 AUG 13	FUEL - GENERAL - ADAPT A330 EIS FUEL SYSTEM TO SUIT A330A+
	Applicable to: ALL			
	H13462		04 OCT 11	FUEL - TANKS - INCREASE TRIM TANK CAPACITY BY 230 LITRES
	Applicable to: ALL			
	H13629		25 NOV 11	FUEL - CROSSFEED SYSTEM - REMOVE CONNECTION FROM APU FEEDLINE
	Applicable to: ALL			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	H13633		01 AUG 13	FUEL - REFUEL/DEFUEL SYSTEM - INSTALL PRESSURE SWITCH AT WING CENTRE SECTION REAR WALL (A330 ONLY)
	Applicable to: ALL			
	H13666	28-4046 01	13 SEP 17	FUEL - FMCS - FIT FCMC (STAGE 7.1) WITH CHANGES TO SOFTWARE FOR A330 AND A340 AIRCRAFT
	Applicable to: ALL			
	H13701		04 OCT 21	FUEL - JETTISON SYSTEM - INSTALL JETTISON SYSTEM ON A330-200
	Applicable to: LV-KAN, LV-KAO			
	H13876	32-4109 01	25 NOV 11	LANDING GEAR-NORMAL BRAKING- INSTALL BSCU SOFTWARE STANDARD S7A
	Applicable to: ALL			
	H13959		01 AUG 13	ICE AND RAIN PROTECTION - WING ICE PROTECTION - REPOSITION OUTBOARD VALVE INBOARD
	Applicable to: ALL			
	H14027	28-3067 01 28-4085 01	30 OCT 14	FUEL - FCMS - INSTALL FCMC STAGE 9.0
	Applicable to: ALL			
	H14072	32-3111 01	25 NOV 11	LANDING GEAR - MAIN GEAR - INTRODUCE SCALLOP ON GROWTH MAIN FITTING TO IMPROVE FATIGUE LIFE (PRODUCTION SOLUTION)
	Applicable to: ALL			
	H14084	32-3115 01 32-4154 02	25 NOV 11	LANDING GEAR - NORMAL BRAKING - INSTALL BSCU S8D SOFTWARE STANDARD
	Applicable to: ALL			
	H14515	28-3079 01 28-4095 01	30 OCT 14	FUEL - FCMS - INSTALL FCMC STAGE 10.0
	Applicable to: ALL			
	H14656	32-3150 01 32-4188 00	30 OCT 14	LANDING GEAR-MAIN GEAR-INTRODUCE NEW UPPER AND LOWER TORQUE LINK AND APEX PIN SUB-ASSEMBLIES
	Applicable to: ALL			
	H14705	32-3149 01 32-4187 01	30 OCT 14	LANDING GEAR - NORMAL BRAKING - INTRODUCE STAGE 9 STANDARD BSCU
	Applicable to: ALL			
	H14892		17 MAY 16	GENERAL-DESIGN WEIGHTS-CERTIFY DOUBLE WEIGHTS MTOW 230T MLW 180T MZFW 168T MTOW 192T MLW 180T MZFW 168T
	Applicable to: LV-GKO			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	H15264		30 OCT 14	GENERAL-DESIGN WEIGHTS-CERTIFICATE A330-200 WV050 MTOW 230T, MLW 180T, MZFW 168T WITH REVISED A/C DESIGN SERVICE GOAL
	Applicable to: ALL			
	H15265		17 MAY 16	GENERAL-DESIGN WEIGHTS-CERTIFICATE A330-200 WV051 MTOW 192T, MLW 180T, MZFW 168T WITH REVISED A/C DESIGN SERVICE GOAL
	Applicable to: LV-GKO			
	H15266		04 OCT 21	GENERAL-DESIGN WEIGHTS-CERTIFICATE A330-200 WV052 MTOW 233T, MLW 182T, MZFW 170T, WITH REVISED A/C DESIGN SERVICE GOAL
	Applicable to: LV-KAN, LV-KAO			
	H15294		22 DEC 16	LANDING GEAR-BRAKE COOLING-INTRODUCE PRODUCTION STANDARD UNIVERSAL BRAKE COOLING FAN (A330/A340)
	Applicable to: LV-GKP, LV-KAN, LV-KAO			
	H15723	28-3102 00 28-4119 00	30 OCT 14	FUEL-FCMS- INSTALL FCMC STAGE 11.0
	Applicable to: ALL			
	H15805	32-3194 01 32-4238 01	30 OCT 14	LANDING GEAR-NORMAL BRAKING-INTRODUCE STAGE 9C STANDARD BSCU
	Applicable to: ALL			
	H16032		30 OCT 14	LANDING GEAR-NOSE-REMOVAL OF THE OVERSTEER WARNING SYSTEM FROM ALL NEW PRODUCTION AIRCRAFT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	H16058		30 OCT 14	INERT GAS SYSTEM - GENERAL - CERTIFICATION OF FUEL TANK INERTING SYSTEM
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	H16141	28-3112 00 28-4128 00	30 OCT 14	FUEL-FUEL CONTROL AND MONITORING SYSTEM (FCMS)- UPDATE FCMC SOFTWARE TO STAGE 12
	Applicable to: ALL			
	H16361		15 FEB 23	MISCELLANEOUS-DESIGN WEIGHTS-CERTIFY A330-200 MTOW 236T, MLW 182T, MZFW 170T (WV 057)
	Applicable to: LV-KHT, LV-KHU			
	H16362		30 OCT 14	MISCELLANEOUS-DESIGN WEIGHTS-CERTIFY A330-200 MTOW 238T, MLW 182T, MZFW 168T (WV 058)
	Applicable to: LV-FVH, LV-FVI, LV-KHT, LV-KHU			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	H16363		15 FEB 23	MISCELLANEOUS-DESIGN WEIGHTS-CERTIFY A330-200 OPERATION WITH DUAL DESIGN WEIGHTS WV 057 OR WV 058
	Applicable to: LV-KHT, LV-KHU			
E	H16450	32-3244 02	30 OCT 14	LANDING GEAR - PARKING/ULTIMATE EMERGENCY BRAKING - ACTIVATE PARK BRAKE SYSTEM MONITORING FUNCTION FOR LONG RANGE
1	**Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU**			
	H16473		30 OCT 14	LANDING GEAR - NOSE GEAR - Reinstallation of the NLG oversteer warning system
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	H16700		22 FEB 16	Miscellaneous - Design Weights - Certify A330-200 Operation with MTOW 242t, MLW 182t and MZFW 166t, WV081
	Applicable to: LV-GHQ, LV-GIF			
	H16775	32-3280 01	17 MAY 16	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU SOFTWARE STANDARD S9D
	Applicable to: ALL			
	S10053		17 MAY 16	AUTO FLIGHT-DEFINE QFE/QNH SETTING
	Applicable to: LV-GKO, LV-GKP			
	S10063		20 AUG 10	ICE AND RAIN PROTECTION-DEFINE DUAL ICE DETECTION SYSTEM- ADVISORY SYSTEM
	Applicable to: ALL			
	S10064		28 NOV 23	INDICATING RECORDING SYSTEM-DEFINE MULTIPURPOSE DISK DRIVE UNIT(MDDU)
	Applicable to: ALL			
	S10072		07 APR 11	NAVIGATION-DEFINE GRID MORA/MSA ON FMS
	Applicable to: ALL			
	S10076		20 AUG 10	OXYGEN-FLIGHT CREW OXYGEN BOTTLE-PROVIDE IN SITU CHARGING
	Applicable to: LV-KHT, LV-KHU			
	S10132		04 OCT 11	NAVIGATION - TCAS - INSTALL TCAS II SYSTEM
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S10139		20 AUG 10	ELECTRICAL POWER - INSTALLATION OF A BATTERY DISCHARGE WARNING
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S10142	25-4088 00	25 NOV 11	EQUIPMENT/FURNISHINGS-COCKPIT-INSTALL PILOT FEET HEATING PANELS
	Applicable to: ALL			
	S10240		25 NOV 11	COMMUNICATIONS-AUDIO MANAGEMENT-IMPROVE ACP
	Applicable to: ALL			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	S10245	21-4066 00	01 AUG 13	AIR CONDITIONING-COCKPIT AIR VENTILATION - INSTALL ELECTRIC HEATERS FOR SIDE WINDOW AIR OUTLETS
	Applicable to: LV-KAN, LV-KAO			
	S10256		17 MAY 16	INDICATING RECORDING SYSTEMS- OVERHEAD PANEL - RELOCATE TOGGLE SWITCH POSITIONS
	Applicable to: LV-GKO, LV-GKP			
	S10300		20 AUG 10	OXYGEN - CREW OXYGEN - INSTALL A 115 CU FEET STEELCYLINDER.
	Applicable to: LV-KHT, LV-KHU			
	S10425		20 AUG 10	ONBOARD MAINTENANCE SYSTEMS-UP AND DOWN DATA LOADING-ADD A SECOND ROTATING KNOB
	Applicable to: ALL			
	S11344	34-4005 10	04 OCT 11	NAVIATION-TCAS-INSTALL PROVISION FOR "FULL TIME DISPLAY" AND "ABOVE/BELOW" FUNCTIONS"
	Applicable to: ALL			
	S11354		20 AUG 10	FLIGHT CONTROLS-EFCS-INSTALL WIRING PROVISIONS FOR CONTROLLING A SECOND TLU
	Applicable to: ALL			
	S11364		01 AUG 13	ELECTRICAL POWER-GENERAL-MODIFY SUPPLY TO CERTAIN CIRCUITS FOR ETOPS
	Applicable to: ALL			
	S11369		16 NOV 22	NAVIGATION - RADIO ALTIMETER- INSTALL COLLINS RADIO ALTIMETER SYSTEMS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S11566	27-4005 12	25 NOV 11	AUTO FLIGHT - CAT III LANDING CAPABILITY TEST INTRODUCE VISUAL INDICATION FOR SIMULTANEOUS SIDE STICK ACTIONS
	Applicable to: ALL			
	S11606		20 AUG 10	COMMUNICATIONS-INTALL COLLINS-HIGH RATE SATCOM AVIONICS
	Applicable to: LV-GKO, LV-GKP			
	S11658	31-4030 00	20 AUG 10	INDICATING/RECORDING SYSTEMS-DISPLAY A RISING RUNWAY SYMBOL ON THE PFD
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S11788		15 JAN 20	FCU STANDARDISATION - LEVEL-OFF CAPABILITY THROUGH V/S FPA SELECTOR
	Applicable to: ALL			
	S11963	21-4026 00	20 AUG 10	INCREASE HORN TIME DELAY IN CASE OF VENT EXTRACT FAULT WARNING
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S12033	23-4034 15	20 AUG 10	COMMUNICATIONS-INSTALL 6 CHANNELS HONEYWELL HIGH RATE SATCOM AVIONICS/BFE
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S12358		20 AUG 10	FLIGHT CONTROLS - CHANGE WIRING OF FCPC1 AND FCSC1 FAULT INDICATOR LIGHTS
	Applicable to: ALL			
	S12383		20 AUG 10	INDICATING/RECORDING SYSTEMS - ELECTRICAL CLOCK - INSTALL CLOCK SMITH/SFE
	Applicable to: ALL			
	S12410		15 FEB 23	ENGINE CONTROL - ACTIVATE A330 RR TRENT DERATED TAKE-OFF
	Applicable to: LV-KHT, LV-KHU			
	S12470		25 NOV 11	NAVIGATION - ATC TRANSPONDER - INSTALL EAS ATC / TCAS CONTROL PANEL
	Applicable to: ALL			
	S12524		15 FEB 23	NAVIGATION - INSTALL BENDIX RADIO ALTIMETER SYSTEMS (QUANTUM LINE) (SFE)
	Applicable to: LV-KHT, LV-KHU			
	S12701		20 AUG 13	NAVIGATION - ATC/MODE'S - INSTALL GABLES ATC/TCAS DUAL CONTROL PANEL
	Applicable to: LV-KAN, LV-KAO			
	S12779		30 OCT 14	FMGEC - INSTALL IMPROVED AUTOPILOT FOR GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S12809	34-4244 00	04 OCT 11	NAVIGATION - ATC TRANSPONDER - INSTALL A SEXTANT ATC/TCAS CONTROL PANEL SFE
	Applicable to: ALL			
	S12819		25 NOV 11	ICE AND RAIN PROTECTION - ICE DETECTION LIGHTED VISUAL ICING INDICATOR
	Applicable to: ALL			
	S12945		17 MAY 18	FLIGHT CONTROLS - EFCS - CONTROL INPUTS AND POWER SUPPLY - PROVIDE A SECOND ELECTRICAL POWER SUPPLY TO FCSC 2
	Applicable to: ALL			
	S12968	34-4050 05	25 NOV 11	NAVIGATION - WEATER RADAR SYSTEM - ACTIVATE THE PREDICTIVE WINDSHEAR FUNCTIONS ON COLLINS WEATHER RADAR
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S13048	24-4019 06	25 NOV 11	ELECTRICAL POWER - ELECTRICAL CONTRACTOR MANAGEMENT SYSTEM - INSTALL NEW ECMU STANDARD 5
	Applicable to: ALL			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	S13080		04 OCT 11	FLIGHT CONTROLS-CONTROL INPUTS AND POWER SUPPLY- PROVIDE A SECOND ELECTRICAL POWER SUPPLY TO FCPC3
	Applicable to: ALL			
	S13113		15 FEB 23	AUTO FLIGHT - FMGEC - INSTALL IMPROVED AUTOPILOT FOR RR ENGINES
	Applicable to: LV-KHT, LV-KHU			
	S13124		13 SEP 13	NAVIGATION - TCAS - INSTALL TCAS COLLINS WITH ATC COLLINS SERIE 900 (BFE)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S13133	30-4020 03	04 OCT 11	WINDSHIELD RAIN PROTECTION - DEACTIVATE RAIN REPELLENT SYSTEM
	Applicable to: ALL			
	S13148		04 OCT 11	EQUIPMENT/FURNISHING - COCKPIT - INSTALL NEW GENERATION OF SEATS INSTALLATION
	Applicable to: ALL			
	S13162		15 MAY 17	ENGINE FUEL AND CONTROL - CONTROLLING - INSTALL FADEC SOFTWARE STD E1I
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S13217		01 AUG 13	FUEL - DISTRIBUTION - INSTALL STRUCTURE AND SYSTEM PROVISIONS FOR ACTIVATION OF CENTER TANK (A330-200)
	Applicable to: ALL			
	S13230		04 OCT 11	NAVIGATION - TCAS - INSTALL BENDIX TCAS II P/N 066-50000-1208
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S13267	34-3092 07	15 FEB 23	NAVIGATION - WEATHER RADAR SYSTEM BENDIX - ACTIVATE PREDICTIVE WINDSHEAR FUNCTION
	Applicable to: LV-KHT, LV-KHU			
	S13298		22 MAR 16	NAVIGATION - INSTALL SFE INSTEAD OF BFE
	Applicable to: ALL			
	S13313		01 AUG 13	FLIGHT CONTROLS - GENERAL - ADAPT RUDDER AND THS CONTROL CABLES
	Applicable to: ALL			
	S13333		25 NOV 11	COMMUNICATIONS - AUDIO MANAGEMENT - INSTALL AMU AND ACP FOR SATCOM
	Applicable to: ALL			
	S13382		15 FEB 23	ENGINE FUEL & CONTROL - CONTROLLING FADEC-A330/ TRENT RR - IMPLEMENT SOFTWARE A7.1 IN EEC
	Applicable to: LV-KHT, LV-KHU			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S13391	34-4055 00	25 NOV 11	NAVIGATION - ADIRS - INSTALL LITTON ADIRU 4 MCU STD WITH IMPROVED PRIMARY GPS (AIME) FUNCTION
	Applicable to: LV-GKO, LV-GKP			
	S13433		30 OCT 14	ENGINE FUEL AND CONTROL - GENERAL - PROVIDE DERATED TAKE OFF FACILITY FOR GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S13434	31-4032 16	01 AUG 13	INDICATING/RECORDING SYSTEM - FWC - DEFINE NEW OEB REMINDER FUNCTION IN FWC
	Applicable to: ALL			
	S13455	22-3019 07 22-4017 08	25 NOV 11	AUTO FLIGHT - FCU - ACTIVATE CROSSED BAR AT GO-AROUND FUNCTION
	Applicable to: ALL			
	S13456		25 NOV 11	INDICATING/RECORDING SYSTEMS - ELECTRICAL CLOCK - INSTALL COCKPIT CLOCK CAPABLE OF GPS TIME (AIR PRECISION)
	Applicable to: ALL			
	S13472		25 NOV 11	LANDING GEAR - ALTERNATE BRAKING - REPLACE BRAKE HYD PRESSURE INDICATOR
	Applicable to: ALL			
	S13495		13 SEP 13	COMMUNICATIONS - SATCOM - ACTIVATE COCKPIT VOICE WITH COLLINS SATCOM AVIONICS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S13607		17 MAY 18	AUTO FLIGHT - FMGEC - INSTALL STANDARD L7 - B4 FOR A330 GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S13608		17 MAY 18	AUTO FLIGHT - FMGEC - INSTALL STANDARD L7 - CD4 FOR A330 PW OR RR ENGINES
	Applicable to: LV-KHT, LV-KHU			
	S13617	29-4032 02	25 NOV 11	HYDRAULIC POWER - MAIN HYDRAULIC POWER - MODIFY POWER SUPPLY OF BLUE ELEC PUMP
	Applicable to: ALL			
	S13622		25 NOV 11	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL DUAL WEATHER RADAR COLLINS P/N 622-5132-120
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S13628		13 SEP 13	OXYGEN - PORTABLE OXYGEN - INSTALL DRAEGER PBE P/N E28180 IN COCKPIT
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S13634		25 NOV 11	NAVIGATION - ADF - DEFINE SECOND ADF RECEIVER INSTALLATION
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S13642		25 NOV 11	COMMUNICATIONS - SATCOM - INSTALL HONEYWELL SATCOM AVIONICS INTERFACED WITH COCKPIT AUDIO SYSTEM
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S13661	34-4107 07	25 NOV 11	NAVIGATION - MMR - INSTALL COLLINS MULTI-MODE RECEIVERS PROVIDING ILS (FM IMMUNE) AND GPS PRIMARY FUNCTIONS
	Applicable to: ALL			
	S13669		30 OCT 14	ENGINE FUEL AND CONTROL - INCORPORATE A330/GE DERATED CLIMB MODIFICATION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S13711	29-4035 02	22 MAR 17	HYDRAULIC POWER - AUXILIARY HYDRAULIC POWER - INSTALLATION OF A320 ELECTRICAL MOTOR PUMP VICKERS MPEV3-032-10B ON YELLOW CIRCUIT
	Applicable to: ALL			
	S13714	29-4037 02	22 MAR 17	HYDRAULIC POWER - AUXILIARY HYDRAULIC POWER - INSTALLATION OF A320 ELECTRICAL MOTOR PUMP ON BLUE SYSTEM
	Applicable to: ALL			
	S13717	29-4036 02	22 MAR 17	HYDRAULIC POWER - AUXILIARY HYDRAULIC POWER - INSTALLATION OF A320 ELECTRICAL MOTOR PUMP ON GREEN SYSTEM
	Applicable to: ALL			
	S13796		25 NOV 11	AUTOFLIGHT - FCU - DEFINE LONG RANGE VERSION OF MODULAR F.C.U.
	Applicable to: ALL			
	S13810		01 AUG 13	PROVIDE VISUAL AND AURAL INDICATION FOR SIMULTANEOUS SIDE STICK ACTION
	Applicable to: ALL			
	S13845		15 FEB 23	ENGINE FUEL & CONTROL-CONTROLLING INCORPORATE A330/RR DERATED CLIMB MODIFICATION
	Applicable to: LV-KHT, LV-KHU			
	S13893		25 NOV 11	OXYGEN - CREW OXYGEN - INSTALL A 115 CU FT COMPOSITE OXYGEN CYLINDER
	Applicable to: ALL			
	S13916		25 NOV 11	ICE AND RAIN PROTECTION - WINDSHIELD RAIN PROTECTION - REACTIVATE THE RAIN REPELLENT SYSTEM WITH FLUID COMPATIBLE WITH OZONE PROTECTION RULE
	Applicable to: ALL			

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M[(1)]	CRITERION	Linked SB	Incorp. Date	Title
	S14029		25 NOV 11	AUTO FLIGHT - MCDU A330/A340 2ND GENERATION (HONEYWELL FMS)
	Applicable to: ALL			
	S14071	34-4244 00	25 NOV 11	NAVIGATION - ATC/MODE S - ATC/TCAS CONTROL PANEL SEXTANT P/N C12404AB02 - CORRECT ATC CODE AT ELECTRICAL POWER TRANSFER
	Applicable to: ALL			
	S14135		01 AUG 13	INDICATING/RECORDING SYSTEMS - EIS - DISPLAY MANAGEMENT COMPUTER - INSTALL NEW DMC SOFTWARE V510X
	Applicable to: ALL			
	S14138		28 SEP 15	ELECTRICAL POWER - GENERAL - BATTERY DC GENERATIONBATTERY-ADAPT DISCHARGE WARNING SYSTEM TO A330 A/C
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S14157		30 OCT 14	AUTO FLIGHT - GE ENGINES - REPLACE STANDARD FLIGHT MANAGEMENT, GUIDANCE AND ENVELOPE COMPUTER (FMGEC)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S14158		01 AUG 13	AUTO FLIGHT - PW/RR ENGINES - REPLACE STANDARD FLIGHT MANAGEMENT, GUIDANCE AND ENVELOPE COMPUTER (FMGEC)
	Applicable to: LV-KHT, LV-KHU			
	S14174		01 AUG 13	INDICATING/RECORDING SYSTEMS - CENTRAL WARNING SYSTEMS - INSTALL NEW FWC STANDARD K3-0
	Applicable to: ALL			
	S14176		18 AUG 21	COMMUNICATIONS - AUDIO MANAGEMENT - INSTALL DIGITAL AMU
	Applicable to: ALL			
	S14196	27-4068 01	25 NOV 11	FLIGHT CONTROLS - FCDC L15/M12 A330-200
	Applicable to: ALL			
	S14216	34-4116 07	25 NOV 11	NAVIGATION - GPWS - INSTALL ENHANCED GROUND PROXIMITY WARNING SYSTEM (NEW SPEC.)
	Applicable to: ALL			
	S14218	34-4116 07	25 NOV 11	NAVIGATION - ENHANCED GPWS - ACTIVATE ENHANCED FUNCTIONS
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S14259		25 NOV 11	INDICATING RECORDING SYSTEMS - MASTER WARNING SYSTEM - MODIFY WIRING BETWEEN "CTR TANK TRANSFER P/B MAN" AND SDAC
	Applicable to: ALL			
	S14273		30 OCT 14	AUTO FLIGHT-FLIGHT MANAGEMENT, GUIDANCE AND ENVELOPPE COMPUTER-GE ENGINES - INSTALL FMGEC WITH HWL FMS2
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S14275		15 FEB 23	AUTO FLIGHT-FLIGHT MANAGEMENT, GUIDANCE AND ENVELOPE COMPUTER PW/RR ENGINES - INSTALL FMGEC WITH HWL FMS2
	Applicable to: LV-KHT, LV-KHU			
	S14327	31-3034 16	25 NOV 11	INDICATING/RECORDING SYSTEMS - CENTRAL WARNING SYSTEMS - PROVIDE NEW AUTO CALL OUT CALLED "V ONE"
	Applicable to: ALL			
	S14445	22-3022 01	25 NOV 11	AUTO FLIGHT - FLIGHT MANAGEMENT - GUIDANCE AND ENVELOPE COMPUTER - IMPROVE FMA ENHANCEMENT
	Applicable to: ALL			
	S14469		01 AUG 13	COMMUNICATIONS - GENERAL - SATELLITE COMMUNICATIONINSTALL SATCOM AVIONIC AERO H+ HONEYWELL
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S14482		25 NOV 11	INFORMATION SYSTEMS - ATIMS - ACTIVATE ATSU
	Applicable to: ALL			
	S14491		15 FEB 23	ENGINE FUEL AND CONTROL - FADEC - A330 RR - INSTALL SOFTWARE STD A9
	Applicable to: LV-KHT, LV-KHU			
	S14521	34-3072 06	30 OCT 14	NAVIGATION - TCAS - INSTALL ALLIED SIGNAL CHANGE 7 P/N 066-50000-2220
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S14562	22-3022 01	13 SEP 13	AUTO FLIGHT - FLIGHT MANAGEMENT GUIDANCE AND ENVELOPPE COMPUTER (FMGES) - INSTALL A NEW STANDARD FMGEC L9CD6
	Applicable to: LV-KHT, LV-KHU			
	S14566		30 OCT 14	ELECTRICAL POWER - BATTERY DC GENERATION - TO INSTALL NEW TECHNOLOGY BATTERIES
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S14591		30 OCT 14	NAVIGATION : TCAS. INSTALL NEW COLLINS TCAS TTR921 P/N 822-1293-320 ASSOCIATED WITH NEW COLLINS ATC TPR901
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S14648	34-4051 01	25 NOV 11	NAVIGATION - AIR-DATA/INITIAL REFERENCE SYSTEM - (ADIRS) (ADIRU & CDU) - IMPROVE LITTON ADIRU TO MAKE IT COMPATIBLE WITH COL MMR
	Applicable to: LV-GKO, LV-GKP			
	S14649	34-4107 07	25 NOV 11	NAVIGATION - MMR - INSTALL COLLINS MULTI-MODE RECEIVERS P/N 822-1152-121
	Applicable to: ALL			
	S14694		13 SEP 17	NAVIGATION-ANGLE OF ATTACK INDICATION- INSTALL ANGLE OF ATTACH SENSORS ROSEMOUNT
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KHT, LV-KHU			
	S14722	34-3184 00	30 OCT 14	NAVIGATION - GPWS - MODIFY EGPWS VISUAL WARNING AND CAUTION INDICATIONS
	Applicable to: ALL			
	S14723		17 MAY 16	ICE AND RAIN PROTECTION : WINDSHIELD RAIN PROTECTION - DE-ACTIVATE NEW RAIN REPELLENT SYSTEM
	Applicable to: LV-GKO, LV-GKP			
	S14736		30 OCT 14	AUTO FLIGHT - FLIGHT MANAGEMENT GUIDANCE AND ENVELOPPE COMPUTER INSTALL A NEW STANDARD FMGEC L9B6
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S14739		30 OCT 14	NAVIGATION - TCAS : INSTALL COLLINS TCAS II COMPUTER P/N : 622-8971-322 WITH CHANGE 7.0.
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S14785		30 OCT 14	NAVIGATION - ISIS - INSTALL PROVISION FOR A SEXTANT AVIONICS INTEGRATED STANDBY INSTRUMENT SYSTEM
	Applicable to: ALL			
	S14786		30 OCT 14	NAVIGATION - ISIS - INSTALL A SEXTANT AVIONIQUE INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)
	Applicable to: ALL			
	S14859		30 OCT 14	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM - INSTALL NEW DISPLAY SYSTEM (EIS2) EQUIPMENTS (DMC/DU/DISKETTES)
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S14950		30 OCT 14	COMMUNICATIONS - RADIO MANAGEMENT - INTRODUCE NEW STD OF RMP (P/N C12848AA02)
	Applicable to: ALL			
	S14954	25-3170 02 25-4187 03	13 JAN 21	EQUIPMENT /FURNISHINGS-COCKPIT- INTRODUCE MINOR IMPROVEMENTS ON WP 430
	Applicable to: ALL			
	S14956		13 SEP 17	ELECTRICAL POWER- AC DISTRIBUTION - INSTALL ELECTRICAL OUTLETS IN COCKPIT (115 VAC/60 HZ)
	Applicable to: ALL			
	S15476		04 OCT 21	COMMUNICATION - HF SYSTEM - ACTIVATE DATA LINK FUNCTION FOR HFDR1
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S15556		30 OCT 14	INDICATING/RECORDING SYSTEMS - EIS - ACTIVATE FUEL FLOW / DELTA ISA FUNCTION BY PIN PROGRAMMING ON DMC.
	Applicable to: ALL			
	S15687	34-3186 02	22 MAR 17	NAVIGATION - EGPWS ACTIVATE PEAKS AND OBSTACLE OPTIONS ON EGPWS BY PIN PROGRAMMING
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU			
	S15688	22-3210 01	14 NOV 19	INDICATING/RECORDING SYSTEMS - FWC - ACTIVATE THE "PITCH-PITCH" VOCAL ALARM BY PIN PROGRAMMING
	Applicable to: LV-FVH, LV-GHQ, LV-GIF			
	S15891	34-3188 00	30 OCT 14	NAVIGATION - EGPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION
	Applicable to: ALL			
	S16107	46-3006 04	25 NOV 11	INFORMATION SYSTEMS - GENERAL - CERTIFY FANS A CONFIGURATIONS (OVERALL MODIFICATION)
	Applicable to: ALL			
	S16115		30 OCT 14	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INTRODUCE NEW ECU "E1L" SOFTWARE ON CF6 80E1 ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S16129	46-3003 06	16 JUL 20	INFORMATION SYSTEM - ATIMS - UPGRADE ATSU AIRCRAFT INTERFACE SOFTWARE FOR FAME APPLICATION
	Applicable to: ALL			
	S16200	34-3187 00	30 OCT 14	NAVIGATION - EGPWS - ACTIVATE GEOMETRIC ALTITUDE FUNCTION
	Applicable to: ALL			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	S16233		15 FEB 23	ENGINE FUEL AND CONTROL - CONTROLLING - INTRODUCE NEW FADEC SOFTWARE STD "A11" ON RR T700 ENGINES
	Applicable to: LV-KHT, LV-KHU			
	S16262	34-3186 02	30 OCT 14	NAVIGATION - EGPWS - ACTIVATE OBSTACLE FUNCTION
	Applicable to: ALL			
	S16263	34-3186 02	30 OCT 14	NAVIGATION - EGPWS - ACTIVATE PEAKS FUNCTION
	Applicable to: ALL			
	S16279		30 OCT 14	FLIGHT CONTROLS - ELECTRICAL FLIGHT CONTROL SYSTEM(EFCS) - INSTALL RUDDER FLY-BY-WIRE ON A330/A340 ENHANCED AIRCRAFT
	Applicable to: ALL			
	S16286		30 OCT 14	INDICATING/RECORDING SYSTEMS - FWC - INSTALL NEW FWC STANDARD K7 CAPABLE OF A330 ENHANCED A/C
	Applicable to: ALL			
	S16318		30 OCT 14	ENHANCED A330/A340 - SECTION 11/12 - INSTALL EMERGENCY POWER CENTER 743 VU
	Applicable to: ALL			
	S16326		30 OCT 14	ELECTRICAL POWER - GENERAL - INSTALL NEW GAPCU STANDARD "4.3"
	Applicable to: ALL			
	S16345	34-3134 16 34-3373 06	22 MAR 16	NAVIGATION - ATC - INSTALL HONEYWELL TRA67A ATC INCORPORATING EUROPEAN MODE S REGULATIONS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S16346	34-3228 00	13 SEP 17	NAVIGATION - ANGLE OF ATTACK INDICATING - INSTALL ANGLE OF ATTACK SENSOR SEXTANT P/N C16291AA
	Applicable to: ALL			
	S16349	31-3096 01	30 OCT 14	INDICATING/RECORDING SYSTEM - DMC - INSTALL NEW DMC SOFTWAR V511X
	Applicable to: ALL			
	S16354	31-3048 00	17 MAY 18	INDICATING/RECORDING SYSTEMS - FWC - REPLACE THE EXISTING STANDARD FWC BY A NEW ONE STANDARD K6 FOR A330 - FAR 121-344
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S16420		15 FEB 23	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL HONEYWELL DUAL CONTROL PANEL CAPABLE OF THE AUTO-TILT AND PWS FUNCTIONS
	Applicable to: LV-KHT, LV-KHU			
	S16483		17 MAY 16	15 KNOTS TAILING OPERATION AT TAKE-OFF (GE ENGINES)
	Applicable to: LV-GKO, LV-GKP			
	S16499		17 MAY 16	NAVIGATION - ATC - INSTALL REMOTE ATC CONTROL BOX
	Applicable to: LV-GKO, LV-GKP			
	S16501	27-3098 00 27-3111 01 27-3132 00	30 OCT 14	FLIGHT CONTROLS-FLIGHT CONTROL PRIMARY COMPUTER (FCPC)-INTRODUCE NEW SOFTWARE "P6/M14" ON FCPC "2K1" - A330 APPLICATION -
	Applicable to: ALL			
R	S16531	34-3135 13 34-3340 16 34-4123 07	30 OCT 14	NAVIGATION - ATC - INSTALL COLLINS ATC MODE S TPR-901 INCORPORATING EUROPEAN REGULATIONS FOR ELEMENTARY (ELS) AND ENHANCED SURVEILLANCE (EHS)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
	S16538	29-3086 02	30 OCT 14	HYDRAULIC POWER - GREEN MAIN HYDRAULIC POWER - INTRODUCE A NEW STANDARD HYDRAULIC SYSTEM MONITORING UNIT (HSMU)
	Applicable to: ALL			
	S16544		30 OCT 14	ONBOARD MAINTENANCE SYSTEMS-UP AND DOWN DATA LOADING SYSTEM - INSTALL DLS/DLRB AND DLRB DISK BASIC CONFIGURATION
	Applicable to: ALL			
	S16556		30 OCT 14	INFORMATION SYSTEMS - AIR TRAFFIC AND INFORMATION MANAGEMENT SYSTEM (ATIMS) - DEFINE AND INSTALL ATC 623 APPLICATIONS SOFTWARE
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S16606		30 OCT 14	INDICATING / RECORDING SYSTEM - EIS: INSTALL NEW EIS2 STANDARD L4 CAPABLE OF A330/A340 ENHANCED.
	Applicable to: ALL			
	S16635		30 OCT 14	NAVIGATION - ADF - REMOVE ADF SYSTEM 1 AND 2 (RECEIVERS AND ANTENNAS).
	Applicable to: ALL			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	S16646	34-3180 00	30 OCT 14	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS DUAL CONTROL PANEL CAPABLE OF MULTISCAN FONCTION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S16652	22-3042 00 22-3144 00	15 FEB 23	AUTO-FLIGHT - FMGEC - INSTALL NEW FMGEC STANDARD P2CD7 (A330 PW-RR)
	Applicable to: LV-KHT, LV-KHU			
	S16653		30 OCT 14	AUTO-FLIGHT - FMGEC - INSTALL NEW FMGEC STANDARD P2B7
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S16701		30 OCT 14	NAVIGATION - ADF - INSTALL ADF1 900 COLLINS RECEIVER
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S16702		17 MAY 16	NAVIGATION - ADF - INSTALL ADF2 900 COLLINS RECEIVER
	Applicable to: LV-GKO, LV-GKP			
	S16762		30 OCT 14	NAVIGATION - AIR DATA INERTIAL REFERENCE SYSTEM (ADIRS) - INSTALL 4MCU ADIRS HONEYWELL (AE21)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S16795	27-3111 01 27-3132 00	30 OCT 14	FLIGHT CONTROL-FLIGHT CONTROL PRIMARY COMPUTER (FCPC) - INTRODUCE NEW SOFWARE FCPC STANDARD P6A/M14A ON A330 AIRCRAFT
	Applicable to: ALL			
	S16804	34-3287 01	30 OCT 14	NAVIGATION - ADIRS - ACTIVATE ALIGNMENT IMPROVEMENT FUNCTION ON ADIRU BY WIRING
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S16812		30 OCT 14	COMMUNICATIONS - RADIO MANAGEMENT : INSTALL NEW RMP STANDARD 2 A P/N : C12848CA01
	Applicable to: ALL			
	S16868	46-3061 10	19 JUL 16	INFORMATION SYSTEMS - ATIMS - (COMPONEMTS AND INTERFACES) INSTALL ATC APPLICATIONS FOR FANS A+
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S16877		30 OCT 14	FLIGHT CONTROL - FLIGHT CONTROL PRIMARY COMPUTER (FCPC) - INTRODUCE NEW FCPC STD "P7/M16" EIS FOR A330 ENHANCED
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S16892		15 FEB 23	ENGINE FUEL AND CONTROL - CONTROLING INTRODUCE NEW EEC SOFTWARE "AI2" ON RR T700 ENGINES - CNF RR 172
	Applicable to: LV-KHT, LV-KHU			
	S16961	34-3184 00	30 OCT 14	NAVIGATION - EGPWS - INSTALL NEW EGPWC
	Applicable to: ALL			
	S16974	22-3047 01 22-3144 00	15 FEB 23	AUTO-FLIGHT - FMGEC - INSTALL NEW FMGEC STANDARD P2CD8 (A330 PW-RR)
	Applicable to: LV-KHT, LV-KHU			
	S16975	22-3049 01	30 OCT 14	AUTO-FLIGHT - FMGEC - INSTALL NEW FMGEC STANDARD P2B8 (A330GE)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S16983	46-3017 30	30 OCT 14	INFORMATION SYSTEMS - GENERAL - CERTIFY FANS A+ CONFIGURATIONS (OVERALL MODIFICATION)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S16985		30 OCT 14	GENERAL - TECHNICAL INFORMATION, WEIGHT AND GC - INCREASE MAXIMUM OPERATING ALTITUDE FROM 41100 TO 41450 FEETS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S17128	45-3007 00 45-4010 00	28 NOV 23	ONBOARD MAINTENANCE SYSTEMS - UP AND DOWN DATA LOADING SYSTEM : INSTALL A MULTIPURPOSE DISK DRIVE UNIT ARINC 615-3 IN THE COCKPIT P/N AC68
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S17176		04 OCT 21	AIR CONDITIONING - GENERAL - COCKPIT A IR VENTILATION - AIR CREW HEATER - SELECTOR SWITCH - MODIFY PLACARD WORDING
	Applicable to: LV-KAN, LV-KAO			
	S17202		30 OCT 14	ON BOARD MAINTENANCE SYSTEMS - CMC - INSTALL NEW CMC STANDARD L6B
	Applicable to: ALL			
	S17464		17 MAY 18	INFORMATION SYSTEMS - A/C INFORMATION NETWORK SYSTEM - ADAPT AINS PROV. FOR INSTALLATION OF SERVER INTERFACE UNIT (SIU) AND INSTALL AINS P/BSW
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S17480		30 OCT 14	NAVIGATION - ILS - INSTALL MMR COLLINS A340-500/600 CERTIFICATION STANDARD (130)
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S17494		30 OCT 14	INDICATING/RECORDING SYSTEM - EIS : INSTALL NEW EIS2 STANDARD L3-1 (DMC, DU AND DISKS)
	Applicable to: ALL			
	S17750	34-4141 01	17 MAY 16	NAVIGATION - ADIRS - INSTALL LITTON ADIRU STANDARD CAPABLE OF A340-500
	Applicable to: LV-GKO, LV-GKP			
	S17765		30 OCT 14	HYDRAULIC POWER - GENERAL - IMPROVE THE HSMU POWER SUPPLY ON GROUND SERVICING
	Applicable to: ALL			
	S17826		30 OCT 14	PNEUMATIC - LEAK DETECTION - INSTALL A SECOND LEAK SYSTEM DETECTION LOOP ON THE APU BLEED AIR SYSTEM ON A330
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S17828	36-3030 01	30 OCT 14	PNEUMATIC - LEAK DETECTION INSTALL BMC "M4" STANDARD ON A330 A/C
	Applicable to: ALL			
	S17830	31-3066 00	30 OCT 14	INDICATING/RECORDINGSYSTEMS - FWC INSTALL NEW FWC STANDARD K8 ON A330
	Applicable to: ALL			
	S17880	31-3069 01	30 OCT 14	INDICATING/RECORDING SYSTEM - EIS : INSTALL NEW EIS2 STANDARD L5 CAPABLE OF VERY LONG RANGE OPERATIONS (LROPS) ON ALL LONG RANGE AIRCRAFT
	Applicable to: ALL			
	S17889	22-3095 01	30 OCT 14	AUTO FLIGHT - FLIGHT CONTROL UNIT (FCU) - ACTIVATE THE PIN PROGRAMMING FOR BARO EXTENSION AT "1100HPA"
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S17964	29-3092 00	30 OCT 14	HYDRAULIC POWER-GROUND INTERNAL LEAK TEST SYSTEM IMPROVE LEAK MEASUREMENT VALVE WARNING SYSTEM ON A330 AND A340 AIRCRAFTS
	Applicable to: ALL			
	S18004	34-3141 00	30 OCT 14	NAVIGATION - STANDBY NAVIGATION SYSTEM - INSTALL NEW ISIS STANDARD POST ISE
	Applicable to: ALL			
	S18015	73-3035 00	30 OCT 14	ENGINE FUEL OAND CONTROL - FADEC - SYSTEM INTRODUCE NEW ECU SOFT STD "EIN" ON A330 A/C WITH GE CF6-80E1 ENGINES CNF GE TBD
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S18018		30 OCT 14	ENGINE - GENERAL - INSTALL NEW GE CF6-80E1A4/B ENGINES ON A330-200/300 AIRCRAFTS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S18084		30 OCT 14	NAVIGATION-ADIRS : INSTALL NEW HONEYWELL ADIRU STANDARD - AE22
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18094		30 OCT 14	FLIGHT CONTROLS - FLIGHT CONTROL PRIMARY COMPUTER (FCPC) - INTRODUCE TRIM SETTING AUTOMATIC FUNCTION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	S18144	34-3213 04	30 OCT 14	NAVIGATION - ADIRS - INTRODUCE AIR DATA MONITORING FUNCTION
	Applicable to: ALL			
	S18159	22-3244 00	30 OCT 14	AUTO FLIGHT - FMGEC - INSTALL FMGEC P4G1 WITH GENEPI HARDWARE AND FMS HONEYWELL RELEASE 1A ON A330 WITH GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S18168	22-3143 00	30 OCT 14	AUTO FLIGHT - MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU) - INSTALL 3 LCD MCDU(HONEYWELL)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18201	27-3148 01	30 OCT 14	FLIGHT CONTROL-FLIGHT CONTROL PRIMARY COMPUTER - INTRODUCE NEW FCPC STD P9/M18 ON 2K2 FOR A330-200 AIRCRAFTS
	Applicable to: ALL			
	S18214		30 OCT 14	EQUIPMENT/FURNISHINGS - COCKPIT - INSTALL SWITCH GUARD FOR 27 MQ ON 271VU
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S18222		30 OCT 14	NAVIGATION - SWITCHING AND INDICATING - REMOVE DDRMI INDICATORS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18244		30 OCT 14	NAVIGATION-SWITCHING AND INDICATING- REMOVE DDRMI INDICATORS AND WIRING PROVISION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHU			
	S18260	34-3154 00	22 DEC 16	NAVIGATION - ATC/MODE S : DEACTIVATE RATC FUNCTION
	Applicable to: LV-GKO, LV-GKP			

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M[(1)]	CRITERION	Linked SB	Incorp. Date	Title
	S18261	21-3112 01	30 OCT 14	FWC-ACQUISITION/INTERFACE CONNECT FWC TO RPWS TO PREVENT DOOR OPENING WITH RESIDUAL CABIN PRESSURE
	Applicable to: ALL			
	S18334	31-3087 00	30 OCT 14	INDICATING/RECORDING SYSTEMS - EIS - INSTALL NEW EIS2 SOFTWARE L6
	Applicable to: ALL			
	S18365	31-3084 02 31-4098 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - SDAC - INSTALL NEW SDAC STANDARD C8-0
	Applicable to: ALL			
	S18422	34-3192 00 34-3197 12 34-4187 04	30 OCT 14	NAVIGATION - ATC - CERTIFY EHS FUNCTION
	Applicable to: ALL			
	S18547	27-3146 01	17 MAY 18	FLIGHT CONTROLS - FCSC - INTRODUCE NEW FCSC STD L19M18 ON LR ENHANCED AIRCRAFTS
	Applicable to: ALL			
	S18559		15 FEB 23	ENGINE FUEL AND CONTROL - FADEC - INTRODUCE NEW EEC SOFTWARE STD "A13" FOR RRT700 ENGINES ON A330 A/C - CNF RR TBD -
	Applicable to: LV-KHT, LV-KHU			
	S18568	31-3104 02	17 MAY 18	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL NEW FWC STANDARD K9-486 ON A330
	Applicable to: ALL			
	S18659	00-3054 07	30 OCT 14	CERTIFICATION DOCUMENTS - GENERAL - CERTIFY THE FLEX TEMPERATURE EXTENSION FOR A330 AIRCRAFT
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	S18713	22-3068 00 22-3144 00	15 FEB 23	AUTO-FLIGHT - FMGEC - INSTALL NEW STANDARD P3CD8 ON A330 PW-RR WITH HONEYWELL CORRECTIVE STANDARD P3
	Applicable to: LV-KHT, LV-KHU			
	S18714	22-3069 00	30 OCT 14	AUTO-FLIGHT - FMGEC - INSTALL NEW STANDARD P3B8 ON A330 GE WITH HONEYWELL CORRECTIVE STANDARD P3
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S18776	31-3160 01	30 OCT 14	INDICATING/RECORDING SYSTEM - FWC - ACTIVATE STATIC PRESSURE MONITORING
	Applicable to: ALL			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S18779	34-3219 31 34-4223 19	30 OCT 14	NAVIGATION - ATC/MODE S (SELECT) CERTIFY ADS-B OUT CAPABILITY THROUGH EXTENDED SUITTER 1090 MHZ.
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18808		30 OCT 14	COMMUNICATIONS - GENERAL - RADIO MANAGEMENT INSTALL RMP STANDARD 3 WITH MLS AND GLS FUNCTION CAPABILITY
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S18817	31-3104 02	17 MAY 18	INDICATING / RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD T1-0
	Applicable to: ALL			
	S18877		30 OCT 14	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS WXR MULTISCAN WRT-2100 P/N 822-1710-213
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S18882	34-3204 01	30 OCT 14	NAVIGATION - DME - RELOCATE DME1 POWER SUPPLY TO PROVIDE POWER IN EMERGENCY FOR A330
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18907		17 MAY 18	INFORMATION SYSTEM - A/C INFORMATION NETWORK SYSTEM - REMOVE P/B 7TL AND ASSOCIATED WIRING
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18924		30 OCT 14	COMMUNICATIONS - SATELLITE COMMUNICATION - INSTALL AND ACTIVATE ROCKWELL COLLINS SRT2100 CAPABLE OF SBB
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S18949		30 OCT 14	INFORMATION SYSTEMS - AIRCRAFT INFORMATION NETWORK SYSTEM - ACTIVATE SIU V5 STANDARD
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S18992		15 FEB 23	ENGINE FUEL AND CONTROL - FADEC - ACTIVATE IPTOS FUNCTION BY DEP REPROGRAMMING ON RR T700 ENGINES - CNF RR 203 -
	Applicable to: LV-KHT, LV-KHU			
	S19020	22-3056 01 22-3144 00	30 OCT 14	AUTO FLIGHT - FMGEC - INSTALL NEW HONEYWELL PERFORMANCE DATA BASE (-905)
	Applicable to: ALL			
	S19117	23-3263 04	04 OCT 21	COMMUNICATIONS - SATELLITE COMMUNICATION-INSTALL HONEYWELL SATCOM HS 720 CAPABLE OF HIGH SPEED DATA FUNCTION
	Applicable to: LV-KAN, LV-KAO			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S19224		30 OCT 14	EQUIPMENT/FURNISHINGS - COCKPIT - - INTRODUCE NEW 272VU AND 252VU IN THE COCKPIT OVERHEAD PANEL
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S19417	31-3125 01	30 OCT 14	INDICATING / RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD T2-0
	Applicable to: ALL			
	S30107	23-3227 00	18 AUG 21	COMMUNICATIONS - AUDIO MANAGEMENT - MODIFY AMU POWER SUPPLY TO COPE WITH DC ESSENTIEL BUS LOSS
	Applicable to: ALL			
	S30117	22-3125 04	15 FEB 23	AUTO FLIGHT - FMGEC - INSTALL NEW HONEYWELL FMGEC STANDARD P3HJ0 BASED ON NEW "GENEPI" HARDWARE ON A330 WITH PW/RR
	Applicable to: LV-KHT, LV-KHU			
	S30118	22-3244 00	30 OCT 14	AUTO FLIGHT - FMGEC - INSTALL NEW HONEYWELL FMGEC STD P3G0 BASED ON NEW "GENEPI" HARDWARE ON A330 WITH GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S30194	31-3122 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS) - INSTALL EIS2 STANDARD L7
	Applicable to: ALL			
	S30201		30 OCT 14	COMMUNICATIONS - AUDIO MANAGEMENT : INSTALL NEW TEAM ACP SATCOM ACP2788AE01
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	S30373	34-3247 22	30 OCT 14	NAVIGATION - TCAS - INSTALL TCAS HONEYWELL TPA100B CHANGE 7.1 CAPABLE OF ATSAW
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S30422		19 MAY 21	COMMUNICATIONS - COCKPIT VOICE RECORDER - INSTALL NEW CVR STEP 2 HONEYWELL
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S30511		30 OCT 14	NAVIGATION - TCAS - REMOVE STD TCAS AND ASSOCIATED ANTENNA
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S30572		30 OCT 14	ONBOARD MAINTENANCE SYSTEMS - CENTRAL MAINTENANCE COMPUTER (CMC) - REMOVE CMC2 FROM LR AIRCRAFT CONFIGURATION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			

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M[(1)]	CRITERION	Linked SB	Incorp. Date	Title
	S30619	31-3125 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - FWC - ACTIVATE ON A330 A/C ENGINE FEEDLINE BURST MONITORING FUNCTION ON FWC T2
	Applicable to: ALL			
	S30640	34-3228 00	13 SEP 17	NAVIGATION - SENSORS POWER SUPPLY AND SWITCHING - INSTALL NEW THALES ANGLE OF ATTACK SENSORS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S30653		30 OCT 14	INDICATING/RECORDING SYSTEMS - DMC - INSTALL ENHANCED DU INSTEAD OF EIS2 LCDU
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S30672	31-3146 02	30 OCT 14	INDICATING/RECORDING SYSTEMS - FWC - INSTALL FWC STANDARD T3-0 ON LR A/C
	Applicable to: ALL			
	S30676	31-3140 01 31-4133 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - SDAC / INTERFACE - INSTALL NEW STANDARD SDAC C9
	Applicable to: ALL			
	S30717	31-3168 02	24 MAY 22	INDICATING / RECORDING SYSTEMS - EIS : INSTALL NEW EIS2 STANDARD L8.
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S30756	22-3147 01 22-3176 09	30 OCT 14	AUTO FLIGHT - FMGEC - DEFINE OPTION FOR "NAV MODE MAINTAIN IN GO AROUND" FUNCTION IN FG
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S30758	22-3176 09	06 JUL 15	AUTO FLIGHT - AUTOPILOT/FLIGHT DIRECTOR (AP/FD)- DEFINE OPTION FOR "NO AP DISCONNECTION AT FMS PROFILE INVALIDATION" FUNCTION IN FGE
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S30759		30 OCT 14	AUTO FLIGHT - FMGEC - DEFINE OPTION FOR "TAIL STRIKE PITCH LIMIT INDICATOR" FUNCTION IN FGE
	Applicable to: LV-FVH, LV-FVI			
	S30777		19 MAY 21	COMMUNICATIONS - COCKPIT VOICE RECORDER (CVR) - INSTALL CVR STEP2 L3COM - P/N 2100-1026-02
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	S30806	22-3110 08 22-3176 09	06 JUL 15	AUTO FLIGHT - FLIGHT MANAGEMENT (FM) ACTIVATE "NO PROFILE INVALIDATION AT MDA -50FT IN FINAL APP" FUNCTION IN FMS RELEASE 1A
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	S30813	22-3110 08 22-3176 09	22 MAR 16	AUTO FLIGHT - FLIGHT MANAGEMENT (FM) - ACTIVATE BARO RADIO SETTING FUNCTION WITH OPC OPTION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S30840		30 OCT 14	FLIGHT CONTROLS - FLIGHT CONTROL DATA CONCENTRATOR (FCDC)- INSTALL NEW FCDC STD L21 FOR ENHANCED LR
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S30862		22 MAR 16	COMMUNICATIONS - RADIO MANAGEMENT - INTRODUCE NEWADIO MANAGEMENT PANEL (RMP) STANDARD "4" WITH CPDLC FUNCTION CAPABILITY
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S30915	27-3164 00	17 MAY 18	FLIGHT CONTROLS - FLIGHT CONTROL PRIMARY COMPUTER (FCPC) - INTRODUCE NEW FCPC STANDARD P11M18A 2K2
	Applicable to: ALL			
	S30934		15 FEB 23	NAVIGATION - GENERAL - FLIGHT MANUAL EXTENSION TO RNP AR 0.3 CAPABILITY - A330 CONFIGURATION
	Applicable to: LV-KHT, LV-KHU			
	S30944	46-3082 01	30 OCT 14	INFORMATION SYSTEMS - ATIMS - INSTALL NEW ATC ARINC 623 FOR DATALINK RECORDING FUNCTION
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S30945	46-3061 10 46-3082 01	30 OCT 14	INFORMATION SYSTEMS - ATIMS - INSTALL NEW ATC FANS A+ APPLICATIONS FOR FANS A+ AND DATALINK RECORDING FUNCTIONS
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S30950		18 NOV 20	INFORMATION SYSTEMS - AIRPLANE INFORMATION NETWORK SYSTEM (AINS) - AVIONICS - REMOVE SERVER INTERFACE UNIT (SIU) ANTI-MOD
	Applicable to: LV-GHQ, LV-GIF, LV-KHT, LV-KHU			
	S30958	31-3178 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - GENERAL - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE NEW FWC STANDARD T4 ON LR A/C
	Applicable to: ALL			
	S30967		22 FEB 16	COMMUNICATIONS - HF SYSTEM - REMOVE HF2 SYSTEM
	Applicable to: LV-GHQ, LV-GIF			
	S31353	31-3154 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
				(FWC)ACQUISITION/INTERFACE - ACTIVATE MONITORING OF ATC/XPDR FAULTS
	Applicable to: ALL			
	S31522		30 OCT 14	NAVIGATION - TCAS - INSTALL TCAS COLLINS TTR-921 CHANGE 7.1
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S31574	45-3018 03	28 NOV 23	ONBOARD MAINTENANCE SYSTEMS (OMS) - UP AND DOWN DATA LOADING SYSTEM - INSTL STD DATA LOADING CONNECTOR
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S31639		30 OCT 14	COMMUNICATIONS - COCKPIT VOICE RECORDER (CVR) - ACTIVATE DATALINK RECORDING FUNCTION ON ATSU/SSCVR
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S31661	27-3175 01	30 OCT 14	FLIGHT CONTROLS - FLIGHT CONTROL DATA CONCENTRATOR (FCDC) - INSTALL NEW FCDC STD L21 (LOW SPEED) FOR ENHANCED LR
	Applicable to: ALL			
	S31820	22-3147 01 22-3176 09	13 MAY 20	AUTO FLIGHT - GENERAL - FMGEC - ACTIVATE BY PIN PROGRAMMING - "NAV MODE MAINTAIN IN GO AROUND" FUNCTION IN FG
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	S31822	22-3176 09	13 SEP 17	AUTO FLIGHT - GENERAL - FMGEC - ACTIVATE BY PIN PROGRAMMING "NO AP DISCONNECTION AT FMS PROFILE INVALIDATI,ON" FUNCTION IN FGE RELEASE 1A
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S31882	22-3213 06	17 MAY 16	AUTO FLIGHT - FMGEC - INTRODUCE OPTION FOR ROPS FUNCTION IN THE FGE
	Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S31924	73-3055 02	30 OCT 14	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INSTALL NEW ECU "E1P" SOFTWARE STANDARD ON CF6 80-E1 - CNF GE 165 -
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S32079		17 MAY 18	NAVIGATION - AIR DATA/INERTIAL REFERENCE SYSTEM - INSTALL NEW ADIRU HONEYWELL STD L4.2 (HYBRID FPA WITHIN BLOCK III ADIRU)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			
	S32100	34-3331 06	30 OCT 14	NAVIGATION - GROUND PROXIMITY WARNING SYSTEM (GPWS) - INSTALL NEW EGPWS STANDARD -006
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			

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M[(1)]	CRITERION	Linked SB	Incorp. Date	Title
	S32159	31-3200 01	30 OCT 14	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE NEW FWC STANDARD T5
	Applicable to: ALL			
	S32258	34-3288 02	30 OCT 14	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS WXR CAPABLE MULTISCAN WITH TRANSCEIVER WRT-2100 (P/N 822-1710-214)
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO			
	S32268		18 DEC 17	AUTO FLIGHT - AUTOPILOT/FLIGHT DIRECTOR (AP/FD) - INTRODUCE TCAP FUNCTION IN THE FGE
	Applicable to: LV-GHQ, LV-GIF			
	S32308	31-3209 01	30 OCT 14	INDICATING / RECORDING SYSTEMS - EIS - INSTALL NEW EIS2 STANDARD L9E
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S32364	27-3205 02	06 JAN 15	FLIGHT CONTROLS - FLIGHT CONTROL PRIMARY COMPUTER (FCPC) - INSTALL FCPC ON LR AIRCRAFT FAMILY P13M22 2K2
	Applicable to: ALL			
	S32640	22-3244 00	30 OCT 14	AUTO FLIGHT - FMGEC - INSTALL FMGEC P4G1A CAPABLE OF NAV MODE KEPT IN GO AROUND ON A330 WITH GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
R	S32655	34-3340 16 34-3373 06	22 NOV 16	NAVIGATION - ATC/MODE S - CONFIGURE DO-260B TRANSPONDER
	Applicable to: ALL			
R	S32704	34-3340 16	22 FEB 16	NAVIGATION - ATC/MODE S - INSTALL ATC COLLINS TPR-901 CAPABLE DO-260B
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			
R	S32795	34-3330 24	22 FEB 16	NAVIGATION - ATC - ACTIVATE ADS-B OUT CAPABILITY FOR ATC TRANSPONDER
	Applicable to: ALL			
	S32847	31-3222 01	17 MAY 16	INDICATING/RECORDING SYSTEMS - SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC) ACQUISITION/INTERFACE - INTRODUCE NEW SDAC STANDARD C11
	Applicable to: LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO, LV-KHT			
	S32958		26 OCT 15	ELECTRICAL POWER - INTEGRATED DRIVE GENERATOR SYSTEM (IDG, GCU)- INSTALL WIRING PROVISIONS FOR OIL LEVEL MEASUREMENT INHIBITION DURING TOWING PHASE
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S32967		16 FEB 22	AUTO FLIGHT - FLIGHT MANAGEMENT GUIDANCE AND ENVELOPE COMPUTER (FMGEC) - ACTIVATE PACKAGE A
	Applicable to: LV-GHQ, LV-GIF			
	S32968		22 FEB 16	FLIGHT CONTROLS - FLIGHT CONTROL PRIMARY COMPUTER (FCPC) - ACTIVATE ELAF FUNCTION ON FCPC (WV80)
	Applicable to: LV-GHQ, LV-GIF			
	S32969	31-3221 00 31-3232 01	22 FEB 16	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE FWC STANDARD T6
	Applicable to: ALL			
	S32978	22-3244 00	30 OCT 14	AUTO FLIGHT - FLIGHT MANAGEMENT GUIDANCE AND ENVELOPE COMPUTER (FMGEC) - INSTALL FMS HONEYWELL PEGASUS II FM KIT WITH NEW FMGEC STANDARD P4AG1B
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S33100		13 SEP 17	NAVIGATION - AIR DATA - Install AOA UTAS with new O-ring design
	Applicable to: LV-FVH, LV-FVI			
	S33104	31-3211 04	30 OCT 14	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS)-ADD PROVISIONS AND DEFINE RED STALL MESSAGE ON PFD
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S33105	31-3211 04	27 APR 15	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS)- ACTIVATE RED STALL MESSAGE ON PFD BY PIN PROGRAMMING
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	S33140	22-3225 01 22-3244 00	22 MAR 16	AUTO FLIGHT - FMGEC - INSTALL STANDARD P5H3 WITH HONEYWELL PEGASUS II FM KIT AND THALES GENEPI FG KIT ON A330 WITH PW/RR OR GE ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	S33153	73-3058 01	22 FEB 16	ENGINE FUEL AND CONTROL - FADEC - INTRODUCE NEW FADEC STANDARD E1Q S/W ON A330 CF6-80E1 ENGINE
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO			
	S33165		22 FEB 16	COMMUNICATIONS - COCKPIT VOICE RECORDER (CVR) - INSTALL CVR CONTROL UNIT COMPLIANT WITH EASA ED-112 MANDATE
	Applicable to: LV-GHQ, LV-GIF			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	S33178		22 MAR 16	COMMUNICATIONS - HF SYSTEM- REINSTALL HF2 SYSTEMS
	Applicable to: LV-GHQ, LV-GIF			
	S33344		22 FEB 16	ELECTRICAL POWER - AC MAIN GENERATION - INTRODUCE GCU STANDARD 5.3 ON A330 A/C
	Applicable to: LV-GHQ, LV-GIF			
	S33382		17 MAY 16	INDICATING/RECORDING SYSTEMS - ELECTRONIC INSTRUMENT SYSTEM (EIS) - INSTALL EIS2 STANDARD L10
	Applicable to: LV-GIF			
	S33538	31-3232 01	22 MAR 17	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE FWC STANDARD T7
	Applicable to: ALL			
	S33772	22-3210 01	17 MAY 16	AUTO FLIGHT - FLIGHT MANAGEMENT, GUIDANCE AND ENVELOPE COMPUTER (FMGEC) - DEFINE "TAIL STRIKE PITCH LIMIT INDICATION FUNCTION
	Applicable to: LV-FVH, LV-GHQ, LV-GIF			
	00-3098 04		19 JUL 16	GENERAL -DESIGN WEIGHTS - CHANGE FROM WV050 (MTOW 230T/MLW 180T/MZFW 168T) TO WV058 (MTOW 238T/MLW 182T/MZFW 168T)
	Applicable to: LV-GKO, LV-GKP			
	21-3112 01		14 MAR 18	AIR CONDITIONING - PRESSURE CONTROL AND MONITORING - PROVIDE WARNING OF EXCESS RESIDUAL CABIN PRESSURE
	Applicable to: LV-GKO, LV-GKP			
	21-3144 02		17 MAY 18	AIR CONDITIONING - PACK CONTROL AND INDICATING - INTRODUCE NEW PACK CONTROLLER B-02
	Applicable to: LV-GKO			
	21-3145 01		17 MAY 18	AIR CONDITIONING - PACK CONTROL AND INDICATING - INTRODUCE NEW PACK CONTROLLER C-05
	Applicable to: LV-GKP, LV-KAN, LV-KAO			
	22-3017 02		17 MAY 16	AUTO FLIGHT - GENERAL - DELETE QFE FUNCTION.
	Applicable to: LV-GKO, LV-GKP			
	22-3049 01		14 MAR 18	AUTO-FLIGHT - FMGEC - INSTALL NEW FMGEC STANDARD P2B8 (A330GE).
	Applicable to: LV-GKO			
	22-3056 01		14 MAR 18	AUTO FLIGHT - FMGEC - INSTALL NEW HONEYWELL PERFORMANCE DATA BASE (PS4087705-905).
	Applicable to: LV-GKO			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	22-3069 00		14 MAR 18	AUTO-FLIGHT - FMGEC - INSTALL NEW STANDARD P3B8 (A330 GE).
	Applicable to: LV-GKO, LV-GKP			
	22-3095 01		04 OCT 21	AUTO FLIGHT - FLIGHT CONTROL UNIT (FCU) - ACTIVATE THE PIN PROGRAMMING FOR BARO EXTENSION AT 1100HPA
	Applicable to: LV-KAN, LV-KAO			
	22-3110 08		15 FEB 23	AUTO FLIGHT - FLIGHT MANAGEMENT SYSTEM - ACTIVATE NO PROFILE INVALIDATION AT MDA - 50FT IN FINAL APP AND ACTIVATE BARO RADIO SETTING FUNCTION.
	Applicable to: LV-KHT, LV-KHU			
	22-3125 04		15 FEB 23	AUTOFLIGHT - FMGEC - UPGRADE FMS 2 HONEYWELL TO FMS 2 RELEASE 1A (P4HJ1)
	Applicable to: LV-KHT, LV-KHU			
	22-3147 01		15 FEB 23	AUTO FLIGHT - FMGEC - INSTALL FMGEC P4HJ1A CAPABLE OF NAV MODE KEPT IN GO AROUND ON A330 WITH PW/RR ENGINES
	Applicable to: LV-KHT, LV-KHU			
	22-3176 09		16 MAY 23	FMGEC - ACTIVATE NO AP DISCONNECTION AT MDA - 50FT IN FINAL APP AND ACTIVATE BARO RADIO SETTING AND ACTIVATE NAV MODE IN GO AROUND
	Applicable to: LV-KAN, LV-KAO			
	22-3194 00		15 FEB 23	AUTO FLIGHT - AUTOTHRUST - ACTIVATE ATHR IN N1 MODE FOR PW/RR FUNCTION INFGE (ONLY FOR HJ1)
	Applicable to: LV-KHT, LV-KHU			
	22-3207 10		16 MAY 23	AUTOPILOT/FLIGHT DIRECTOR (AP/FD) - ACTIVE AP/FD TCAS
	Applicable to: LV-KAN, LV-KAO			
	22-3210 01		15 NOV 18	AUTO FLIGHT - FMGEC - DEFINE "TAIL STRIKE PITCH LIMIT INDICATION" FUNCTION
	Applicable to: LV-FVH			
	22-3213 06		28 NOV 23	GENERAL - ACTIVATE ROPS FUNCTION BASED ON EGPWS
	Applicable to: LV-KAN, LV-KAO			
	22-3223 01		16 JAN 19	AUTO-FLIGHT - FMGEC - INSTALL HONEYWELL STANDARD P3B9 ON A330 WITH GE ENGINES
	Applicable to: LV-GKO, LV-GKP			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	22-3225 01		14 MAR 18	AUTO FLT-FMGEC-INSTL STD P5H3 WITH HNWLPEGASUS II FM KIT AND THALES GENEPI FG KIT ON A330 WITH PW/RR OR GE ENGINES
	Applicable to: LV-FVH, LV-FVI			
	22-3244 00		04 OCT 21	AUTO FLIGHT - FMGEC - FMGEC UPGRADE TO P5-H3 (FROM FG PRE-GENEPI)
	Applicable to: LV-KAN, LV-KAO			
	22-3264 01		23 MAY 19	AUTO FLIGHT - FMGEC - INSTALL FMGEC HONEYWELL STD P4AH3
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	22-3267 02		13 JAN 21	FMGEC - INSTALL FMGEC STANDARD P5AH3
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO			
	23-3227 00		18 AUG 21	COMMUNICATIONS - AUDIO MANAGEMENT - MODIFY AMU POWER SUPPLY TO COPE WITH DC ESSENTIAL BUS LOSS.
	Applicable to: LV-GKO, LV-GKP			
	23-3263 04		04 OCT 21	COMMUNICATIONS - SATCOM - INSTALL SATCOM AVIONICS WITH FULL SBB CAPABILITY
	Applicable to: LV-KAN, LV-KAO			
	25-3623 01		14 MAR 18	EQUIPMENT / FURNISHING - CREW REST ROOM (UNDERFLOOR) - INSTALL LOWER DECK MOBILE CREW REST (LDMCR) PROVISIONS FOR ENHANCED CABIN
	Applicable to: LV-GKO, LV-GKP			
	27-3146 01		17 MAY 18	FLIGHT CONTROLS - FCSC - INTRODUCE FCSC STD L19M18 ON A330 A/C.
	Applicable to: LV-GKO, LV-GKP			
	27-3148 01		14 MAR 18	FLIGHT CONTROL - FLIGHT CONTROL PRIMARY COMPUTER - INTRODUCE NEW FCPC STD P9/M18 ON A330 AIRCRAFT.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	27-3164 00		17 MAY 18	FLIGHT CONTROLS -FLIGHT CONTROL PRIMARY COMPUTER - INTRODUCE NEW FCPC STANDARD P11M20 2K2 ON A330 AIRCRAFT
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	27-3175 01		14 MAR 18	FLIGHT CONTROLS - FLIGHT CONTROL DATA CONCENTRATOR (FCDC) - INSTALL NEW FCDC STD L21 (LOW SPEED)
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	27-3201 05		17 MAY 18	FLIGHT CONTROLS - FLAPS - INTRODUCE SFCC RESET FUNCTION IN THE COCKPIT
	Applicable to: LV-GKO			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	27-3205 02		14 MAR 18	FLIGHT CONTROLS - FCPC - INTRODUCE NEW FCPC STD P13M22 2K2
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	27-3222 01		16 JAN 19	FLIGHT CONTROLS - FCPC - INSTALL FCPC P15/M24 2K2
	Applicable to: ALL			
	28-3102 00		14 MAR 18	FUEL - FCMS - INSTALL FCMC STAGE 11.0
	Applicable to: LV-GKO, LV-GKP			
	28-3112 00		14 MAR 18	FUEL-FUEL CONTROL AND MONITORING SYSTEM (FCMS) - UPDATE FCMC SOFTWARE TO STAGE 12
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	29-3092 00		14 MAR 18	HYDRAULIC POWER-GROUND INTERNAL LEAK TEST SYSTEM - IMPROVE LEAK MEASUREMENT VALVE WARNING SYSTEM
	Applicable to: LV-GKO			
	30-3029 00		17 MAY 16	ICE AND RAIN PROTECTION - WINDSHIELD RAIN PROTECTION - REACTIVATION OF RAIN REPELLENT SYSTEM
	Applicable to: LV-GKO, LV-GKP			
	31-3034 16		15 NOV 18	INDICATING/RECORDING SYSTEMS - CENTRAL WARNING SYSTEMS - ACTIVATE "V ONE" AUTO CALL-OUT.
	Applicable to: LV-GKO			
	31-3066 00		14 MAR 18	INDICATING/RECORDING SYSTEMS - FWC - INSTALL NEW FWC STANDARD K8 ON A330.
	Applicable to: LV-GKO			
	31-3069 01		14 MAR 18	INDICATING/RECORDING SYSTEM - EIS - INSTALL NEW EIS2 STD L5.
	Applicable to: LV-GKO			
	31-3084 02		17 MAY 18	INDICATING/RECORDING SYSTEMS - SDAC - INSTALL NEW SDAC STANDARD C8-0.
	Applicable to: LV-GKO, LV-GKP			
	31-3087 00		14 MAR 18	INDICATING/RECORDING SYSTEMS - EIS - INSTALL NEW EIS2 SOFTWARE L6-1.
	Applicable to: LV-GKO, LV-GKP			
	31-3104 02		12 JUL 17	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD T1-0.
	Applicable to: LV-GKO, LV-GKP			
	31-3122 01		15 JAN 20	INDICATING / RECORDING SYSTEMS - EIS - INSTALL NEW EIS2 STANDARD L7.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	31-3125 01		14 MAR 18	INDICATING / RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD T2-0.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3140 01		17 MAY 18	INDICATING/RECORDING SYSTEMS - SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC) ACQUISITION / INTERFACE - INSTALL NEW STANDARD SDAC C9-0
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3146 02		14 MAR 18	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INSTALL FWC STANDARD T3-0.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3154 01		14 MAR 18	INDICATING RECORDING SYSTEMS - FWC - ACTIVATE MONITORING OF ATC/XPDR FAULTS.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3160 01		14 MAR 18	INDICATING/RECORDING SYSTEM - FWC - ACTIVATE STATIC PRESSURE MONITORING.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3168 02		24 MAY 22	INDICATING / RECORDING SYSTEMS - EIS - INSTALL NEW EIS2 STANDARD L8.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3178 01		14 MAR 18	INDICATING/RECORDING SYSTEMS - FWC - INTRODUCE NEW FWC STANDARD T4 ON LR A/C
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	31-3200 01		14 MAR 18	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE FWC STANDARD T5
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	31-3209 01		16 JUL 19	INDICATING / RECORDING SYSTEMS - EIS - INSTALL NEW EIS2 STANDARD L9E
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3211 04		18 AUG 21	EIS - DEFINE RED STALL MESSAGE ON PFD
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	31-3221 00		15 FEB 23	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE FWC STANDARD T6
	Applicable to: LV-KHT, LV-KHU			
	31-3222 01		17 AUG 22	INTRODUCE NEW SDAC STANDARD C11
	Applicable to: LV-GKO, LV-KAN, LV-KAO, LV-KHT			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
	31-3232 01		14 MAR 18	INDICATING/RECORDING SYSTEMS - FLIGHT WARNING COMPUTER (FWC) - INTRODUCE FWC STD T7
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	31-3242 03		16 NOV 22	DMC ACQUISITION / INTERFACE - INSTALL WIRING AND ACTIVATE REVERSIBLE BACK-UP SPEED SCALE (BUSS) THROUGH PUSH BUTTON FOR BUSS FUNCTION
	Applicable to: LV-GHQ, LV-GIF, LV-GKP			
N	31-3279 01		21 FEB 24	INSTALL T9-3 STD - CEO
	Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT			
	32-3194 01		14 MAR 18	LANDING GEAR - NORMAL BRAKING - INTRODUCE STAGE 9C STANDARD BSCU
	Applicable to: LV-GKO, LV-GKP			
E	32-3196 02		22 NOV 16	LANDING GEAR - NORMAL BRAKING - BSCU 9C - MODIFY THE BSCU 9C PIN PROGRAMMING TO OBTAIN POWERED STEERING ANGLE OF 65 DEG
2	**Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU**			
E	32-3244 02		14 MAR 18	LANDING GEAR - PARKING/ULTIMATE EMERGENCY BRAKING - ACTIVATE PARKING BRAKE MONITORING FUNCTION
3	**Applicable to: LV-GKO, LV-GKP, LV-KAO**			
	32-3280 01		06 MAR 19	LANDING GEAR - NORMAL BRAKING - INTRODUCE BSCU SOFTWARE STANDARD S9D
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	34-3141 00		14 MAR 18	NAVIGATION - STANDBY NAVIGATION SYSTEM - INSTALL NEW ISIS STANDARD PN C16221WA01
	Applicable to: LV-GKO			
	34-3154 00		14 MAR 18	NAVIGATION - ATC/MODES - DEACTIVATE RATC FUNCTION.
	Applicable to: LV-GKO			
	34-3180 00		14 MAR 18	NAVIGATION - WEATHER RADAR SYSTEM - UPDATE OF COLLINS MULTISCAN RADAR SYSTEM INSTALLATION
	Applicable to: LV-GKO, LV-GKP			
	34-3184 00		14 MAR 18	NAVIGATION - EGPWS - INSTALL NEW EGPWC PN 965-1676-002.
	Applicable to: LV-GKO, LV-GKP			
	34-3186 02		11 JUL 18	NAVIGATION - EGPWS - ACTIVATE PEAKS AND OBSTACLE FUNCTIONS.
	Applicable to: LV-GKO, LV-GKP			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	34-3187 00		14 MAR 18	NAVIGATION - EGPWS - ACTIVATE GEOMETRIC ALTITUDE FUNCTION.
	Applicable to: LV-GKO, LV-GKP			
	34-3188 00		14 MAR 18	NAVIGATION - EGPWS - USE LATERAL GPS POSITION WITH AUTOMATIC DESELECTION OF THE TERRAIN MODES.
	Applicable to: LV-GKO, LV-GKP			
	34-3192 00		14 MAR 18	NAVIGATION - ATC - CERTIFY EHS FUNCTION.
	Applicable to: LV-GKO, LV-GKP			
	34-3213 04		14 MAR 18	NAVIGATION - ADIRS - INTRODUCE BACK-UP SPEED SCALE FUNCTION.
	Applicable to: LV-GKO, LV-GKP			
	34-3219 31		14 MAR 18	NAVIGATION - ATC/MODE S (SELECT) - CERTIFY ADS-B OUT CAPABILITY THROUGH EXTENDED SQUITTER 1090 MHZ.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	34-3227 01		17 MAY 16	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL ROCKWELL COLLINS WEATHER RADAR TRANSCEIVER -203 FULLY COMPLIANT WITH MULTISCAN FUNCTION.
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	34-3228 00		14 MAR 18	NAVIGATION - SENSORS POWER SUPPLY AND SWITCHING - INSTALL THALES ANGLE OF ATTACK SENSORS PN C16291AB
	Applicable to: LV-KAN, LV-KAO			
	34-3247 22		14 MAR 18	NAVIGATION - TCAS - INSTALL TCAS HONEYWELL TPA-100B, ATSAW CAPABLE
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	34-3287 01		14 MAR 18	NAVIGATION - ADIRS - ACTIVATE IMPROVEMENT FUNCTION ON ADIRU
	Applicable to: LV-GKO, LV-GKP			
	34-3288 02		17 MAY 18	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS WXR CAPABLE MULTISCAN WITH TRANSCEIVER WRT-2100 (PN 822-1710-214)
	Applicable to: LV-GKO			
	34-3289 00		17 MAY 18	NAVIGATION - WEATHER RADAR SYSTEM - INSTALL COLLINS WXR MULTISCAN WITH TRANSCEIVER WRT-2100 (PN 822-1710-204)
	Applicable to: LV-GKO, LV-KAN, LV-KAO			

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M(1)	CRITERION	Linked SB	Incorp. Date	Title
N	34-3315 01		21 FEB 24	AOA - INSTALL AOA PROBES IN MIXED CONFIGURATION - THALES FOR CAPT AND FIRST OFFICER AND UTAS ON STANDBY
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KHT, LV-KHU			
N	34-3330 24		21 FEB 24	ATC - ACTIVATE ADS-B OUT DO-260B CAPABILITY FOR ATC TRANSPONDER
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	34-3331 06		28 NOV 23	GROUND PROXIMITY WARNING SYSTEM (GPWS) - INSTALL EGPWS STANDARD -006
	Applicable to: LV-KAN, LV-KAO			
N	34-3340 16		21 FEB 24	ATC - INSTALLATION OF ATC TRANSPONDERS ROCKWELL-COLLINS COMPLIANT ADS-B OUT DO-260B PN 822-1338-225
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP			
	34-3345 10		28 NOV 23	GENERAL - RNP AR / SAAR CAPABILITY (STEP 3)
	Applicable to: LV-KAN, LV-KAO			
	34-3373 06		04 OCT 21	ATC - INSTALL ATC HONEYWELL TRA-100B COMPLIANT ADS-B OUT RAD/DO-260B
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	36-3030 01		14 MAR 18	PNEUMATIC - LEAK DETECTION - INSTALL BMC "M4" STANDARD ON A330 A/C.
	Applicable to: LV-GKO, LV-GKP			
	45-3018 03		28 NOV 23	UP AND DOWN DATA LOADING SYSTEM - REMOVE MDDU AND INSTALL A CENTRALIZED DATA LOADING CONNECTOR
	Applicable to: LV-KAN, LV-KAO			
	46-3082 01		04 OCT 21	INFORMATION SYSTEMS - ATIMS - INSTALL ATSU A/C INTERFACE SOFTWARE (STD CLR7) WITH ARF CONF. SOFTWARE FOR IMPLEMENTATION OF FANS A+ AND DATALINK RECORDING FUNCTIONS
	Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU			
	49-3029 01		14 MAR 18	AIRBORNE AUXILIARY POWER - CONTROL AND MONITORING - UPDATE VERSATILE ELECTRONIC CONTROL BOX (VECB) AND ELECTRONIC CONTROL BOX (ECB) SOFTWARE OF APU 331-350
	Applicable to: LV-GKO, LV-GKP, LV-KAN			
	71-3034 00		11 JAN 18	POWER PLANT - FAN COWL DOOR - INTRODUCE LATCH COWLS BEFORE FLIGHT FLAGS TO INCREASE UNLATCHED FAN COWLS VISIBILITY
	Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP			

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M[1]	CRITERION	Linked SB	Incorp. Date	Title
	73-3035 00		14 MAR 18	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INTRODUCE NEW ECU S/W PN 1960M84P04 (STD.E1N) ON A330 FITTED WITH GE ENGINES.
	Applicable to: LV-GKO			
	73-3055 02		14 MAR 18	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INSTALL NEW ECU "E1P" SOFTWARE STANDARD ON CF6 80-E1 ENGINES
	Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO			
	73-3056 00		15 FEB 23	ENGINE FUEL AND CONTROL - FADEC - INTRODUCE NEW A14.1.3 EEC STD FOR RR700 ENGINES
	Applicable to: LV-KHT, LV-KHU			
	73-3058 01		17 MAY 18	ENGINE FUEL AND CONTROL - FADEC SYSTEM - INSTALL NEW ECU SOFTWARE STANDARD "E1Q" ON CF6 80-E1 ENGINES
	Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-KAN, LV-KAO			

(1) Evolution code : N=New, R=Revised, E=Effectivity

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PRELIMINARY PAGES

SUMMARY OF HIGHLIGHTS

Localization Title	Toc Index	ID	Reason
PLP-LOM-H16450	11	1	Effectivity update: The information now also applies to LV-KAO.
PLP-LOM-32-3196	40	2	Effectivity update: The information now also applies to LV-KAO.
PLP-LOM-32-3244	40	3	Effectivity update: The information now also applies to LV-KAO.

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GENERAL INFORMATION

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Localization Title	Toc Index	ID	Reason
GEN ALTSM	B	1	Documentation update: Addition of "ALTSM" documentary unit

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AIRCRAFT CONFIGURATION SUMMARY

Ident.: GEN-ACS-00016732.0001001 / 26 JUN 15
Applicable to: ALL

For awareness and for the specified aircraft, the following table provides the flight crew with a list of optional aircraft systems and functions related to flight and aircraft operations.

Ident.: GEN-ACS-00019461.0001001 / 22 MAR 16
Applicable to: ALL

Item	System	Installed

Ident.: GEN-ACS-00016736.0002001 / 23 JUN 15
Applicable to: ALL

ADS-B OUT	SURV	Yes

Ident.: GEN-ACS-00025993.0001001 / 08 NOV 22
Applicable to: ALL

ALTERNATE AP	AUTO FLT	No

Ident.: GEN-ACS-00016735.0001001 / 26 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

AP/FD TCAS	AUTO FLT	No

Ident.: GEN-ACS-00016735.0002001 / 26 JUN 15
Applicable to: LV-KAN, LV-KAO

AP/FD TCAS	AUTO FLT	Yes

Ident.: GEN-ACS-00016734.0001001 / 14 OCT 15
Applicable to: LV-GKO, LV-GKP

AP Automatic Disconnection at Minima	AUTO FLT	Yes

Ident.: GEN-ACS-00016734.0002001 / 14 OCT 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AP Automatic Disconnection at Minima	AUTO FLT	No

Ident.: GEN-ACS-00016737.0002001 / 22 FEB 16
Applicable to: ALL

Automatic FD Bar Engagement	AUTO FLT	Yes

Ident.: GEN-ACS-00016738.0002001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

BUSS	NAV	Yes

Ident.: GEN-ACS-00016738.0003001 / 23 JUN 15
Applicable to: LV-GHQ, LV-GIF, LV-GKP

BUSS Reversible	NAV	Yes

Ident.: GEN-ACS-00016739.0002001 / 23 JUN 15
Applicable to: ALL

CPDLC	DATALINK	Yes

Ident.: GEN-ACS-00023456.0001001 / 04 JUN 19
Applicable to: ALL

Descent Profile Optimization (DPO)	AUTO FLT	No

Ident.: GEN-ACS-00023785.0003001 / 26 NOV 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FANS A+	DATALINK	Yes

Ident.: GEN-ACS-00023785.0002001 / 26 NOV 19
Applicable to: LV-GKO, LV-GKP

FANS A	DATALINK	Yes

Ident.: GEN-ACS-00016740.0001001 / 23 JUN 15
Applicable to: ALL

FLS Function in the FMS	AUTO FLT	No

Ident.: GEN-ACS-00016741.0002001 / 16 NOV 18
Applicable to: LV-GKO, LV-GKP

FMS2 (including RF leg capability)	AUTO FLT	Yes

Ident.: GEN-ACS-00016741.0009001 / 16 NOV 18
Applicable to: LV-KHT, LV-KHU

FMS2 Release 1A (including RF leg capability)	AUTO FLT	Yes

Ident.: GEN-ACS-00016741.0012001 / 16 NOV 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

FMS2 Release 2 (including RF leg capability)	AUTO FLT	Yes

Ident.: GEN-ACS-00025849.0001001 / 03 NOV 22
Applicable to: ALL

G/S Mode Engagement before LOC Mode Engagement	AUTO FLT	No

Ident.: GEN-ACS-00016742.0001001 / 23 JUN 15
Applicable to: ALL

GLS	AUTO FLT	No

Ident.: GEN-ACS-00016743.0002001 / 23 JUN 15
Applicable to: ALL

GPS	NAV	Yes

Ident.: GEN-ACS-00016755.0002001 / 23 JUN 15
Applicable to: ALL

GPS PRIMARY Function	NAV	Yes

Ident.: GEN-ACS-00023460.0002001 / 18 NOV 21
Applicable to: ALL

HPFD	EIS	No

Ident.: GEN-ACS-00016745.0001001 / 23 FEB 16
Applicable to: LV-GKO, LV-GKP

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	No

Ident.: GEN-ACS-00016745.0002001 / 23 FEB 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	Yes

Ident.: GEN-ACS-00024597.0002001 / 04 NOV 20
Applicable to: ALL

PED compatible Flight Document Stowage Aluminium Box	EQPT	Yes

Ident.: GEN-ACS-00016746.0002001 / 23 JUN 15
Applicable to: ALL

PWS	SURV	Yes

Ident.: GEN-ACS-00016747.0001001 / 23 JUN 15
Applicable to: ALL

QFE BARO Setting	NAV	No

Ident.: GEN-ACS-00019770.0001001 / 10 MAY 16
Applicable to: ALL

RAAS	SURV	No

Ident.: GEN-ACS-00016748.0001001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

RNP AR	AUTO FLT	No

Ident.: GEN-ACS-00016748.0002001 / 16 NOV 18
Applicable to: LV-KHT, LV-KHU

RNP AR limited to 0.3	AUTO FLT	Yes

Ident.: GEN-ACS-00016748.0004001 / 16 NOV 18
Applicable to: LV-KAN, LV-KAO

RNP AR below 0.3	AUTO FLT	Yes

Ident.: GEN-ACS-00016749.0001001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KHT, LV-KHU

ROW/ROPS	SURV	No

Ident.: GEN-ACS-00016749.0002001 / 23 JUN 15
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

ROW/ROPS	SURV	Yes

Ident.: GEN-ACS-00025080.0003001 / 15 NOV 21
Applicable to: ALL

SLS	NAV	No

Ident.: GEN-ACS-00016750.0001001 / 22 MAR 17
Applicable to: ALL

Soft Go-Around	ENG	No

IF INSTALLED TABLE

Ident.: GEN-IFIT-00016907.0001001 / 23 JUN 15
Applicable to: ALL

The "If Installed Table" provides a list of optional systems and functions of the aircraft.
For most of the optional systems or functions associated with the "if installed" ◁ symbol in the FCOM, the table indicates if the optional systems or functions are installed, or not installed.

Note: *Highly customized options such as cabin installations are not covered in the following table.*

Ident.: GEN-IFIT-00019462.0001001 / 22 MAR 16
Applicable to: ALL

Item	System	Installed

Ident.: GEN-IFIT-00026516.0001001 / 03 NOV 23
Applicable to: ALL
L13

4th OCC 4th Occupant Forth Occupant	EQUIPMENT	No

Ident.: GEN-IFIT-00020211.0001001 / 30 AUG 18
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU
L13

1 ADF ADF 1 ADF1 ADF	NAV	No

Ident.: GEN-IFIT-00020211.0002001 / 22 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO
L13

1 ADF ADF 1 ADF1 ADF	NAV	Yes

Ident.: GEN-IFIT-00020212.0001001 / 13 SEP 16
Applicable to: LV-GKO, LV-GKP

L13

2 ADFs 2 ADF ADF1 ADF 1 ADF 1/BFO BFO/ADF 2 ADF 1/FREQ FREQ/ADF 2 ADF 2 ADF2 ADFs	NAV	Yes

Ident.: GEN-IFIT-00020212.0002001 / 30 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

2 ADFs 2 ADF ADF1 ADF 1 ADF 1/BFO BFO/ADF 2 ADF 1/FREQ FREQ/ADF 2 ADF 2 ADF2 ADFs	NAV	No

Ident.: GEN-IFIT-00026031.0001001 / 03 MAY 23
Applicable to: ALL

ADLU	DATA LOADING	No

Ident.: GEN-IFIT-00016894.0002001 / 23 JUN 15
Applicable to: ALL

ADS-B OUT	SURV	Yes

Ident.: GEN-IFIT-00016983.0001001 / 21 MAR 16
Applicable to: ALL

L13

Air Flow Selector AUTO Function AUTO position	COND	No

Ident.: GEN-IFIT-00016895.0001001 / 21 MAR 16
Applicable to: ALL

L13

ALTN N/W STRG ALTN N/W STRG pb Alternate Nose Wheel Steering	GEAR	No

Ident.: GEN-IFIT-00026228.0001001 / 03 MAY 23
Applicable to: ALL

ALTERNATE AP	AUTO FLT	No

1 Ident.: GEN-IFIT-00026591.0002001 / 26 JAN 24
Applicable to: ALL

ALTSM	SURV	No

Ident.: GEN-IFIT-00016896.0001001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

AP/FD TCAS	AUTO FLT	No

Ident.: GEN-IFIT-00016896.0002001 / 23 JUN 15
Applicable to: LV-KAN, LV-KAO

AP/FD TCAS	AUTO FLT	Yes

Ident.: GEN-IFIT-00016897.0001001 / 23 JUN 15
Applicable to: ALL

ATSAW	SURV	No

Ident.: GEN-IFIT-00020577.0001001 / 20 DEC 16
Applicable to: ALL
L13

Weather Hazard Prediction Function WX+T+HZD HZD switch ON WX+T+H	SURV	No

Ident.: GEN-IFIT-00019326.0002001 / 21 MAR 16
Applicable to: ALL

Automatic Control Logic of the Wing and Engine Scan Lights	LIGHTS	Yes

Ident.: GEN-IFIT-00016984.0002001 / 23 JUN 15
Applicable to: ALL

Automatic FD Bar Engagement	AUTO FLT	Yes

Ident.: GEN-IFIT-00017044.0001001 / 23 JUN 15
Applicable to: ALL

Avionic Bay Portable Fire Extinguisher	FIRE	No

Ident.: GEN-IFIT-00016985.0001001 / 21 MAR 16
Applicable to: ALL
L13

Avionics Access Ladder Avionics Compartment Access Ladder	DOORS	Yes

Ident.: GEN-IFIT-00017001.0001001 / 21 MAR 16
Applicable to: ALL

L13

Avionics Ground Cooling GND Cool pb GND Cool Valve Position GND Cool Indication GND COOL FAULT	COND	No

Ident.: GEN-IFIT-00017027.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

L13

BARO/RADIO Instead of MDA/MDH/DH BARO/RADIO OPTION	NAV	No

Ident.: GEN-IFIT-00017027.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

BARO/RADIO Instead of MDA/MDH/DH BARO/RADIO OPTION	NAV	Yes

Ident.: GEN-IFIT-00019327.0001001 / 21 MAR 16
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

Battery Discharge Warning	ELEC	No

Ident.: GEN-IFIT-00019327.0004001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

Battery Discharge Warning	ELEC	Yes

Ident.: GEN-IFIT-00016898.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

L13

Brake Fans Brake Cooling Fans BRAKE FAN BRK FAN	BRAKE	No

Ident.: GEN-IFIT-00016898.0002001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

L13

Brake Fans Brake Cooling Fans BRAKE FAN BRK FAN	BRAKE	Yes

Ident.: GEN-IFIT-00017025.0001001 / 21 MAR 16
Applicable to: ALL

L13

Bulk Cargo Door a bulk cargo compartment door Bulk Cargo Compartment Door Bulk	DOOR	Yes

Ident.: GEN-IFIT-00016993.0003001 / 21 MAR 16
Applicable to: ALL

L13

Bulk Cargo Heating AFT (BULK) LDF HEATER FAULT Bulk Cargo Compartment Temperature BULK CRG DUCT OVHT BULK DUCT OVHT BULK LDF DUCT OVHT BULK (FWD) CRG HEAT FAULT BULK (FWD) (CRG) HEAT FAULT Heating BULK HEAT	VENT	Yes

Ident.: GEN-IFIT-00019329.0002001 / 21 MAR 16
Applicable to: ALL

L13

BUSS Backup Speed/Altitude Scale Backup Speed Scale	NAV	Yes

Ident.: GEN-IFIT-00016902.0009001 / 21 MAR 16
Applicable to: LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

Chemical Oxygen System 15 min Chemical Oxygen System Chemical Generators 15 min	OXY	Yes

Ident.: GEN-IFIT-00016902.0011001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKP

L13

Chemical Oxygen System 22 min Chemical Oxygen System Chemical Generators 22 min	OXY	Yes

Ident.: GEN-IFIT-00016903.0001001 / 30 AUG 18
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

L13

CIDS-SDF CIDS CIDS-SF Smoke Detection Function (SDF)	SMOKE	No

Ident.: GEN-IFIT-00016903.0002001 / 30 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

L13

CIDS-SDF CIDS CIDS-SF Smoke Detection Function (SDF)	SMOKE	Yes

Ident.: GEN-IFIT-00021302.0002001 / 06 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

CMC 2	MAINTENANCE	Yes

Ident.: GEN-IFIT-00021302.0001001 / 06 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

CMC 2	MAINTENANCE	No

Ident.: GEN-IFIT-00016995.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

L13

Cockpit Door Deadbolt Deadbolt	EQUIPMENT	No

Ident.: GEN-IFIT-00016995.0003001 / 20 MAR 17
Applicable to: LV-KHT, LV-KHU

L13

Cockpit Door Deadbolt Deadbolt	EQUIPMENT	Yes

Ident.: GEN-IFIT-00016986.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

L13

Cockpit Fixed Oxygen System External Filling Port Filling Port for External Oxygen Replenishment	OXY	No

Ident.: GEN-IFIT-00016986.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

L13

Cockpit Fixed Oxygen System External Filling Port Filling Port for External Oxygen Replenishment	OXY	Yes

Ident.: GEN-IFIT-00016987.0001001 / 21 MAR 16
Applicable to: ALL

L13

Cockpit Fixed Second Oxygen Bottle or two	OXY	No

Ident.: GEN-IFIT-00016996.0003001 / 20 MAR 17
Applicable to: ALL

L13

Cockpit Foot Warmer Foot Warmer System Foot Warmer ON/OFF Control Switch	EQUIPMENT	Yes

Ident.: GEN-IFIT-00021679.0001001 / 30 AUG 18
Applicable to: ALL

L13

Cockpit Power Outlet Power Outlet	EQUIPMENT	Yes

Ident.: GEN-IFIT-00016988.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

L13

Cockpit Side Electrical Heater Electrical heating of side window blow air HEATER selector Cockpit Crew - Individual Heaters HEATER CAPT HEATER F/O	COND	No

Ident.: GEN-IFIT-00016988.0002001 / 21 MAR 16
Applicable to: LV-KAN, LV-KAO

L13

Cockpit Side Electrical Heater Electrical heating of side window blow air HEATER selector Cockpit Crew - Individual Heaters HEATER CAPT HEATER F/O	COND	Yes

Ident.: GEN-IFIT-00016989.0001001 / 21 MAR 16
Applicable to: ALL

L13

Cockpit Side Electrical Heater Individual sw CAPT HEATER sw FO HEATER sw HEATER pushbutton	COND	No

Ident.: GEN-IFIT-00016904.0001001 / 23 JUN 15
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

CVR Datalink Function	COM	No

Ident.: GEN-IFIT-00016904.0002001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

CVR Datalink Function	COM	Yes

Ident.: GEN-IFIT-00016905.0001001 / 04 SEP 18
Applicable to: ALL

CVR ERASE Function	COM	Yes

Ident.: GEN-IFIT-00016906.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU
L13

DDRMI Digital Distance and Radio Magnetic indicator	NAV	No

Ident.: GEN-IFIT-00016906.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP
L13

DDRMI Digital Distance and Radio Magnetic Indicator	NAV	Yes

Ident.: GEN-IFIT-00026305.0005001 / 24 NOV 23
Applicable to: LV-GIF
L13

DECEL Message on the PFD DECEL	EIS	Yes

Ident.: GEN-IFIT-00026305.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU
L13

DECEL Message on the PFD DECEL	EIS	No

Ident.: GEN-IFIT-00016909.0002001 / 21 MAR 16
Applicable to: ALL
L13

Derated Climb Derate DRT CLB THR DCLB 1(2)	ENG	Yes

Ident.: GEN-IFIT-00016910.0002001 / 21 MAR 16
Applicable to: ALL

L13

Derated Takeoff DRT DRT TO MAN DTO Derated Level	ENG	Yes

Ident.: GEN-IFIT-00023455.0001001 / 04 JUN 19
Applicable to: ALL

L13

Descent Profile Optimization DPO	AUTO FLT	No

Ident.: GEN-IFIT-00016972.0002001 / 21 MAR 16
Applicable to: ALL

L13

Display of Delta ISA Delta ISA	EIS	Yes

Ident.: GEN-IFIT-00025198.0001001 / 09 NOV 21
Applicable to: ALL

DLSU	DATA LOADING	No

Ident.: GEN-IFIT-00019044.0001001 / 21 MAR 16
Applicable to: ALL

L13

Door Aural Warning Horn a warning horn Warning Horn	DOOR	No

Ident.: GEN-IFIT-00016973.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

L13

DOOR SW OVRD pb DOOR SW OVRD	DOOR	No

Ident.: GEN-IFIT-00016973.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

L13

DOOR SW OVRD pb DOOR SW OVRD	DOOR	Yes

Ident.: GEN-IFIT-00016911.0002001 / 23 JUN 15
Applicable to: ALL

Dual Ice Detection System	ICE	Yes

Ident.: GEN-IFIT-00016913.0002001 / 17 MAR 17
Applicable to: ALL

L13

Predictive GPWS EGPWS	SURV	Yes

Ident.: GEN-IFIT-00016914.0002001 / 23 JUN 15
Applicable to: ALL

ELT sw	COM	Yes

Ident.: GEN-IFIT-00016915.0001001 / 23 JUN 15
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

Extended FLEX Takeoff	ENG	No

Ident.: GEN-IFIT-00016915.0002001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

Extended FLEX Takeoff	ENG	Yes

Ident.: GEN-IFIT-00016916.0002001 / 21 MAR 16
Applicable to: ALL

L13

External Ice Detector Light External Light	ICE	Yes

Ident.: GEN-IFIT-00020806.0002001 / 10 JAN 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

EVAC COMMAND pb EVAC COMMAND	COM	Yes

Ident.: GEN-IFIT-00020806.0001001 / 10 JAN 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

L13

EVAC COMMAND pb EVAC COMMAND	COM	No

Ident.: GEN-IFIT-00021299.0002001 / 30 AUG 18
Applicable to: ALL

L13

FANS A DCDU ATC MSG pb	FANS	Yes

Ident.: GEN-IFIT-00021300.0002001 / 30 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

FANS A+ DCDU ATC MSG pb	FANS	Yes

Ident.: GEN-IFIT-00021300.0001001 / 30 AUG 18
Applicable to: LV-GKO, LV-GKP

L13

FANS A+ DCDU ATC MSG pb	FANS	No

Ident.: GEN-IFIT-00023080.0001001 / 12 FEB 19
Applicable to: ALL

FANS B	FANS	No

Ident.: GEN-IFIT-00023081.0001001 / 12 FEB 19
Applicable to: ALL

FANS C	FANS	No

Ident.: GEN-IFIT-00016917.0001001 / 22 MAR 17
Applicable to: ALL

L13

Fixed Cabin Gaseous Oxygen System Interconnected Cylinders PAX OXY	OXY	No

Ident.: GEN-IFIT-00016918.0001001 / 18 MAY 22
Applicable to: ALL

L13

FLS F-G/S BASED ON ISA F-G/S-F-LOC F-G/S-LOC F-LOC*/F-LOC F-LOC* F-LOC F-G/S* F-G/S FLS 1 FLS 2 NO FLS FOR THIS APPR	AUTO FLT	No

Ident.: GEN-IFIT-00024763.0001001 / 10 MAY 21
Applicable to: ALL

L13

FLS/FINAL APP - Coexistence FLS/FINAL APP	AUTO FLT	No

Ident.: GEN-IFIT-00016919.0001001 / 23 JUN 15
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FTIS	FUEL	No

Ident.: GEN-IFIT-00016919.0002001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

FTIS	FUEL	Yes

Ident.: GEN-IFIT-00016998.0001001 / 13 MAY 22
Applicable to: LV-GKO, LV-GKP

L13

FWD Cargo Heating Forward Cargo Heating Forward Cargo Compartment Temperature Cargo Heating FWD(AFT) CRG COND FWD CRG REGUL FWD CRG COOLING FWD CRG HEAT FWD CRG COND FWD CRG TEMP FWD CRG VENT Forward Lower Deck (LD) cargo compartment temperature FWD CRG DUCT OVHT LD FWD TEMP cargo cooling selector FWD CARGO COOLING selector FWD Cargo Cooling	COND	No

Ident.: GEN-IFIT-00016998.0002001 / 13 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

FWD Cargo Heating Forward Cargo Heating Forward Cargo Compartment Temperature Cargo Heating FWD(AFT) CRG COND FWD CRG REGUL FWD CRG COOLING FWD CRG HEAT FWD CRG COND FWD CRG TEMP FWD CRG VENT Forward Lower Deck (LD) cargo compartment temperature FWD CRG DUCT OVHT LD FWD TEMP cargo cooling selector FWD CARGO COOLING selector FWD Cargo Cooling	COND	Yes

Ident.: GEN-IFIT-00016921.0002001 / 21 MAR 16
Applicable to: ALL

L13

GAPCU Ground and Auxiliary Power Control Unit	ELEC	Yes

Ident.: GEN-IFIT-00016923.0001001 / 21 MAR 16
Applicable to: ALL

L13

GLS GLS AUTOLAND GLS 1 GLS 2 GLSs	AUTO FLT	No

Ident.: GEN-IFIT-00016924.0002001 / 21 MAR 16
Applicable to: ALL

L13

GPS GPS 1 (2) FAULT GPS 1+2 FM/GPS POS DISAGREE REF/GPS POS DIFF NAV FM/GPS POS DISAGREE	NAV	Yes

Ident.: GEN-IFIT-00016925.0002001 / 21 MAR 16
Applicable to: ALL

L13

GPS PRIMARY Function PREDICTIVE GPS PREDICTIVE GPS PAGE PREDICTIVE CIV GPS PAGE GPS PRIMARY GPS PRIMARY LOST MCDU PAGE	NAV	Yes

Ident.: GEN-IFIT-00016926.0001001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

L13

HF Datalink HF 1(2) DATA FAULT HF DATA LINK	COM	No

Ident.: GEN-IFIT-00016926.0002001 / 20 MAR 17
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU
L13

HF Datalink HF 1(2) DATA FAULT HF DATA LINK	COM	Yes

Ident.: GEN-IFIT-00016927.0002001 / 21 MAR 16
Applicable to: ALL
L13

HF2 HF 2	COM	Yes

Ident.: GEN-IFIT-00019980.0001001 / 01 JUN 17
Applicable to: ALL
L13

HUD HUDC 2	SURV	No

Ident.: GEN-IFIT-00016929.0001001 / 23 JUN 15
Applicable to: LV-KHT, LV-KHU

IRS Alignment Based on GPS Position	NAV	No

Ident.: GEN-IFIT-00016929.0002001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

IRS Alignment Based on GPS Position	NAV	Yes

Ident.: GEN-IFIT-00016930.0002001 / 23 JUN 15
Applicable to: ALL

ISIS	NAV	Yes

Ident.: GEN-IFIT-00020520.0001001 / 17 MAR 17
Applicable to: ALL
L13

ITP ATSA ITP ITP TRAFFIC LIST page IN TRAIL PROCEDURE IN TRAIL PROCEDURE page	SURV	No

Ident.: GEN-IFIT-00016932.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU
L13

Jettison JET GW JETTISON SYSTEM JETTISON ARM pb-sw JETTISON ACTIVE pb-sw	FUEL	No

Ident.: GEN-IFIT-00016932.0002001 / 17 MAR 17
Applicable to: LV-KAN, LV-KAO

L13

Jettison JET GW JETTISON SYSTEM JETTISON ARM pb-sw JETTISON ACTIVE pb-sw	FUEL	Yes

Ident.: GEN-IFIT-00016975.0001001 / 21 MAR 16
Applicable to: ALL

L13

Landscape Camera LANDSCAPE	MISC	No

Ident.: GEN-IFIT-00026341.0001001 / 09 NOV 23
Applicable to: ALL

LDG SURV	SURV	No

Ident.: GEN-IFIT-00020235.0001001 / 30 AUG 18
Applicable to: LV-KAN

L13

Man-made Obstacle Function OBSTACLE AHEAD OBSTACLE AHEAD, PULL UP AVOID OBSTACLE OBST OBST AHEAD OBSTACLE OBSTACLE, PULL UP PULL UP CAUTION OBSTACLE	SURV	No

Ident.: GEN-IFIT-00020235.0002001 / 30 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU

L13

Man-made Obstacle Function OBSTACLE AHEAD OBSTACLE AHEAD, PULL UP AVOID OBSTACLE OBST OBST AHEAD OBSTACLE OBSTACLE, PULL UP PULL UP CAUTION OBSTACLE	SURV	Yes

Ident.: GEN-IFIT-00026340.0002001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

MDDU	MAINTENANCE	Yes

Ident.: GEN-IFIT-00026340.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

MDDU	MAINTENANCE	No

Ident.: GEN-IFIT-00019325.0002001 / 21 MAR 16
Applicable to: ALL

MMR	NAV	Yes

Ident.: GEN-IFIT-00023123.0002001 / 04 JUN 19
Applicable to: ALL

L13

MORA Minimum Off Route Altitude (MORA)	AUTO FLT	Yes

Ident.: GEN-IFIT-00016934.0001001 / 23 JUN 15
Applicable to: LV-GKO, LV-GKP

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	No

Ident.: GEN-IFIT-00016934.0002001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

NAV Mode automatically Engaged (Armed) in Go-Around	AUTO FLT	Yes

Ident.: GEN-IFIT-00016977.0002001 / 23 JUN 15
Applicable to: ALL

OEB Reminder	EIS	Yes

Ident.: GEN-IFIT-00020210.0001001 / 17 MAR 17
Applicable to: ALL

L13

On-board Mobile Telephony System On-board Mobile Telephony System (OMTS) OMTS	COM	No

Ident.: GEN-IFIT-00021298.0002001 / 30 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

Optional Applications DCL OCL D-ATIS	FANS	Yes

Ident.: GEN-IFIT-00021298.0001001 / 30 AUG 18
Applicable to: LV-GKO, LV-GKP

L13

Optional Applications DCL OCL D-ATIS	FANS	No

Ident.: GEN-IFIT-00020600.0001001 / 09 MAY 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

L13

PAX SATCOM System PAX SATCOM pb	COM	No

Ident.: GEN-IFIT-00020600.0002001 / 22 MAR 17
Applicable to: LV-KAN, LV-KAO

L13

PAX SATCOM System PAX SATCOM pb	COM	Yes

Ident.: GEN-IFIT-00016937.0002001 / 17 MAR 17
Applicable to: ALL

L13

PWS PWS PWS FUNCTION Predictive WindShear (PWS) function PRED W/S DET FAULT	SURV	Yes

Ident.: GEN-IFIT-00016978.0001001 / 21 MAR 16
Applicable to: ALL

L13

QAR QAR	RECORDING	No

Ident.: GEN-IFIT-00016979.0001001 / 21 MAR 16
Applicable to: ALL

L13

QFE BARO Setting QFE OPTION	NAV	No

Ident.: GEN-IFIT-00016939.0001001 / 21 MAR 16
Applicable to: ALL

L13

RAAS RUNWAY AWARENESS AND ADVISORY SYSTEM	SURV	No

Ident.: GEN-IFIT-00016938.0003001 / 21 MAR 16
Applicable to: ALL

L13

Rain Repellent System Rain Repel Rain Repellent RAIN REPELLENT SYSTEM INDICATORS CAPT RAIN REPELLENT F/O RAIN REPELLENT	RAIN	Yes

Ident.: GEN-IFIT-00016940.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU
L13

Refuel Panel in Cockpit REFUEL PUSHBUTTON THE REFUEL PANEL OR THE COCKPIT REFUEL	FUEL	No

Ident.: GEN-IFIT-00016940.0002001 / 21 MAR 16
Applicable to: LV-KAN, LV-KAO
L13

Refuel Panel in Cockpit REFUEL PUSHBUTTON THE REFUEL PANEL OR THE COCKPIT REFUEL	FUEL	Yes

Ident.: GEN-IFIT-00016980.0001001 / 23 JUN 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

Rising Runway Symbol	EIS	No

Ident.: GEN-IFIT-00016980.0002001 / 23 JUN 15
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

Rising Runway Symbol	EIS	Yes

Ident.: GEN-IFIT-00016941.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU
L13

RMP Load Function LOAD FUNCTION	COM	No

Ident.: GEN-IFIT-00016941.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF
L13

RMP Load Function LOAD FUNCTION	COM	Yes

Ident.: GEN-IFIT-00016942.0001001 / 23 JUN 15
Applicable to: ALL

RNP pb	NAV	No

Ident.: GEN-IFIT-00016981.0001001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KHT, LV-KHU
L13

ROW/ROPS ROW/ROP ROW	SURV	No

Ident.: GEN-IFIT-00016981.0002001 / 28 MAY 20
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

L13

ROW/ROPS ROW/ROP ROW	SURV	Yes

Ident.: GEN-IFIT-00016943.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

L13

RPCU RESIDUAL PRESSURE CONTROL UNIT (RPCU)	CAB PR	No

Ident.: GEN-IFIT-00016943.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

RPCU RESIDUAL PRESSURE CONTROL UNIT (RPCU)	CAB PR	Yes

Ident.: GEN-IFIT-00016944.0002001 / 21 MAR 16
Applicable to: ALL

L13

SATCOM SATCOM CHANNEL 1(2) SATCOM DATA SATCOM DATA FAULT SATCOM FAULT SATCOM VOICE FAULT	COM	Yes

Ident.: GEN-IFIT-00025954.0001001 / 04 NOV 22
Applicable to: ALL

SBAS	NAV	No

Ident.: GEN-IFIT-00016945.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

L13

SDCU Smoke Detection Control Unit	SMOKE	No

Ident.: GEN-IFIT-00016945.0002001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

L13

SDCU Smoke Detection Control Unit	SMOKE	Yes

Ident.: GEN-IFIT-00025078.0001001 / 15 NOV 21
Applicable to: ALL

SLS	NAV	No

Ident.: GEN-IFIT-00019345.0001001 / 12 JUL 18
Applicable to: ALL

L13

Soft Go-Around GA SOFT Go-Around soft	ENG	No

Ident.: GEN-IFIT-00026343.0001001 / 09 NOV 23
Applicable to: ALL

SURF-A TRAF	SURV	No

Ident.: GEN-IFIT-00022447.0001001 / 04 DEC 18
Applicable to: ALL

SYNCHRO AVIONICS	Information	No

Ident.: GEN-IFIT-00016946.0001001 / 23 JUN 15
Applicable to: ALL

T2CAS	SURV	No

Ident.: GEN-IFIT-00016947.0001001 / 23 JUN 15
Applicable to: ALL

T3CAS	SURV	No

Ident.: GEN-IFIT-00016948.0001001 / 01 JUN 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

L13

Tail Strike Pitch Limit Indicator Tail Strike Pitch Limit Indicator Landing Tailstrike Indicator	EIS	No

Ident.: GEN-IFIT-00016948.0002001 / 01 JUN 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

L13

Tail Strike Pitch Limit Indicator Tail Strike Pitch Limit Indicator Landing Tailstrike Indicator	EIS	Yes

Ident.: GEN-IFIT-00016949.0001001 / 23 JUN 15
Applicable to: ALL

Taxiing Aid Camera	MISC	No

Ident.: GEN-IFIT-00016950.0001001 / 22 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

L13

Thrust Bump Thrust Bump Indication	ENG	No

Ident.: GEN-IFIT-00016950.0002001 / 22 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

L13

Thrust Bump Thrust Bump Indication	ENG	Yes

Ident.: GEN-IFIT-00026342.0002001 / 09 NOV 23
Applicable to: ALL

L13

TO SURV TOS	SURV	No

Ident.: GEN-IFIT-00016951.0002001 / 21 MAR 16
Applicable to: ALL

L13

TPIS TIRE LO PR	WHEEL	Yes

Ident.: GEN-IFIT-00020007.0002001 / 22 MAR 17
Applicable to: ALL

L13

Trim Tank Pump Trim Tank Forward Transfer Pump	FUEL	Yes

Ident.: GEN-IFIT-00025944.0001001 / 03 NOV 22
Applicable to: ALL

3 waste storage tanks	WASTE	No

Ident.: GEN-IFIT-00023461.0001001 / 10 NOV 22
Applicable to: ALL

L13

Single waste storage tank 1 waste storage tank	WASTE	No

AIRBUS COPYRIGHT

Ident.: GEN-00024475.0001001 / 05 MAY 22
Applicable to: ALL

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MAIN FCOM CHANGES

Ident.: GEN-00013886.0001001 / 03 AUG 17
Applicable to: ALL

The purpose of the Main FCOM Changes is to provide Operators with general information about the most significant changes that are introduced in the current revision of the manual.
The main FCOM changes are available on the Airbus World portal, under the path: Content Library / Flight Operations / Manuals / Main FCOM - FCTM - MMEL Changes.

In addition, every revised Documentary Unit (DU) has a revision highlight (HL) that:
- Indicates the change(s) made to the DU
- Can be found in the associated “Preliminary Pages – Summary of Highlights” subchapter.

In addition to the Main FCOM Changes, the Modification Operational Impact (MOI) documents available on the Airbus World portal provide the operational impact linked to a MOD number.

FCOM PURPOSE

Ident.: GEN-00012540.0001001 / 18 NOV 21
Applicable to: ALL

FCOM PURPOSE

The Flight Crew Operating Manual is a support document for flight crew.

The purpose of the FCOM is to:
- Provide all necessary operating limitations, procedures, performance and system information the flight crew needs to safely and efficiently operate A330/A340 aircraft during normal, abnormal, and emergency situations
- Serve directly as Flight Crew Operating Manual, or as a basis for Operators to develop their own customized Airline Operations Manual, in accordance with applicable requirements
- Serve as a comprehensive reference guide during initial and refresher flight crew training.

Note: *This manual is not designed:*

- *To teach basic piloting skills*
- *To provide basic piloting techniques applicable to jet aircraft, or information, that are considered as basic airmanship for trained flight crews who are familiar with that type of aircraft and its general handling characteristics.*

The FCOM complements the Airplane Flight Manual.
If the FCOM data differs from the AFM data, the AFM remains the reference.
As a supplement to the FCOM, the FCTM may provide additional information that the flight crew should read in conjunction with the FCOM. For more information, *Refer to FCTM/GI FCTM Purpose*.
For any questions or comments related to this manual, the Operator's Flight Operations Management can contact the Airbus Flight Operations Support & Training Standards department.

FCOM CONTENTS

The FCOM has four sections:

- Aircraft Systems : This section is divided into ATA chapters for each aircraft system. This section includes a specific description of each system and its associated cockpit interfaces. When several layouts are possible for the same cockpit interfaces (e.g. when the position of the ON/OFF label of a switch changes depending on the aircraft configuration), the FCOM may describe only one typical layout.
- Procedures : This section contains the following chapters:
  - Abnormal and Emergency Procedures
  - Normal Procedures that include the SOP, the SUP, and the SRP
  - Special Operations.
- Limitations : This section provides the aircraft and system limitations that the flight crew must know or refer to in operations.
- Performance : This section includes the performance computation description for each flight phase.

DOCUMENTARY UNITS

The FCOM is made of Documentary Units. The DU is the smallest part of information with a technical content.
The DUs are listed on a separate "List of Effective Documentary Units" (LEDU). *Refer to GEN List of Effective Documentary Units (LEDU) - Paper Only*.

Note: *1. DUs can be grouped into Group of DU (GDU)*
2. Temporary information may be provided via Temporary DU (TDU).

IDENTIFICATION STRIP

Below the title of the DU, the identification strip provides:
- The list of MSN the DU is applicable to
- For TDU, the reference to the DU impacted by the TDU.

LIST OF EFFECTIVE SECTIONS/SUBSECTIONS (LESS) - PAPER ONLY

Ident.: GEN-00013869.0001001 / 24 MAR 11
Applicable to: ALL

The List of Effective Sections/Subsections (LESS) summarizes all the sections and subsections contained in the FCOM. For each revision, a new LESS is issued when at least one DU of the section/subsection is changed.

The LESS consists of:
- The "M" field that may provide the following evolution code:
  - The "N" letter indicates a new section introduced by the revision
  - The "R" letter indicates a section in which the content has been revised
  - The "E" letter indicates an aircraft validity change within the section
  - The "M” letter indicates a section that have move within the FCOM
- The “Localization” field that allows localizing the section within the manual with the product structure
- The “Subsection title” field
- The “Rev. Date” field that indicated the date at which the section was changed.

LIST OF EFFECTIVE DOCUMENTARY UNITS (LEDU) - PAPER ONLY

Ident.: GEN-00013872.0001001 / 24 MAR 11
Applicable to: ALL

For each revision, a new List of Effective Documentary Units (LEDU) is issued at the section level. The LEDU provides information about the DU localization, applicability, identification and issue date.

The LEDU consists of:

- The "M" field that may provide the following Evolution Code:
  - The "N" letter indicates a new DU introduced by the revision
  - The "R" letter indicates a revised DU: The content of the DU is updated by the revision. A vertical line in the margin of the DU locates the modified part
  - The "E" letter indicates an aircraft validity change for the DU: The list of MSNs for which the DU is effective has been changed compared to the previous LEDU, by addition or deletion of one or several MSN
- The “Localization” field that allows localizing the DU in the manual with the product structure of the manual
- The "T" field (Temporary Information) that contains a cross if the associated DU is a TDU
- The "DU title" that provides the title of the DU
- The “DU identification” that identifies the DU with its identification number or the GDU with its code.
- The “DU date” that indicates when the DU has been released
- The DU criteria which lists the technical or operational criteria for which the DU and solution is applicable to.
- The “Applicable to” which provides the list of aircraft this DU and solution is applicable to
- The "Impacted by TDU" which is the identification of the TDU superseding the DU

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS (LETDU) - PAPER ONLY

Ident.: GEN-00013887.0001001 / 29 MAR 11
Applicable to: ALL

The List of Effective Temporary Documentary Units (LETDU) provides a summary of the Temporary DU impacting the section.

The LETDU consists of:

- The "M" field that may provide the following Evolution Code:
  - The "N" letter indicates a new TDU introduced by the revision
  - The "R" letter indicates a revised TDU: The content of the TDU is updated by the revision. A vertical line in the margin of the TDU locates the modified part
  - The "E" letter indicates an aircraft validity change for the TDU: The list of MSNs the TDU is applicable to has been changed compared to the previous LETDU, by addition or deletion of one or several MSN
- The “Localization” field that allows localizing the TDU in the manual with the product structure of the manual
- The “TDU Title” that provides the title of the TDU

- The “TDU identification” that identifies the TDU with its identification number with its own unique code
- The “TDU date” that indicates when the TDU has been released
- The TDU criteria which lists the technical or operational criteria, the it is applicable to
- The “Applicable to” which provides the list of aircraft this TDU is applicable to
- The “Impacted DU” which is the Identification of DU superseded by the TDU
- The “Reason for issue” of the TDU

Note: *1. TDU is displayed on a yellow background.*
2. Within the QRH the TDU replaces the impacted DU.

AIRCRAFT ALLOCATION TABLE (AAT) - PAPER ONLY

Ident.: GEN-00013888.0001001 / 24 MAR 11
Applicable to: ALL

The Aircraft Allocation Table (AAT) provides a view of the fleet covered in the FCOM. For each aircraft, the AAT provides its MSN, its registration number and the model.

LIST OF MODIFICATIONS (LOM) - PAPER ONLY

Ident.: GEN-00013889.0001001 / 25 MAR 11
Applicable to: ALL

The List of Modifications (LOM) lists the criteria (Modification Proposal (MP) or Service Bulletins (SB)) which the installation on the aircraft affects the FCOM.

Note: *Each MP has one or more associated MODs. The MP/MOD correlation is available in AirN@v / Engineering.*

The LOM also indicates:
- The title of the criteria
- The date of incorporation of the criteria in the FCOM
- The list of aircraft that have the criteria
- The "M" field that may indicate the following evolution code:
  - The "E" letter indicates an aircraft validity change of the criteria. The list of aircraft to which the criteria applies has changed compared to the previous FCOM revision, by addition or deletion of one or several aircraft.
  - The "N" letter indicates new criteria added by this FCOM revision
  - The "R" letter indicates a change in the criteria title or associated SB.

FCOM USE AND ORGANIZATION

Ident.: GEN-00012542.0001001 / 21 MAR 16
Applicable to: ALL

DEFINITIONS OF WARNINGS, CAUTIONS AND NOTES

The following are the official definitions of warnings, cautions and notes taken directly from the JAR25/CS-25 and applicable to Airbus flight operation documentation:

WARNING	An operating procedure, technique, etc. that may result in personal injury or loss of life if not followed.
CAUTION	An operating procedure, technique, etc. that may result in damage to equipment if not followed..
NOTE	An operating procedure, technique, etc. considered essential to emphasize. Information contained in notes may also be safety related.

INFORMATION TYPE AND LAYERS

The FCOM has technical information that may be used for:

- Flight crew operations in flight, or on ground
- Airlines operations on ground
- Training.

To take the above-noted objectives into account, the FCOM is organized in three layers as follows:

- Layer 1: "Need to know"
  Layer 1 presents information that is necessary in the cockpit.
- Layer 2: "Nice to know"
  Layer 2 presents information that is used as a reference, in order to fully understand the logic of the aircraft and pilot interfaces.
- Layer 3: Detailed information
  Layer 3 provides more detailed explanations, that are not necessarily needed in flight.

Note: For paper only, the following examples show the visual characteristics of each kind of layer

EXAMPLE	- Text in layer 1 Layer 1 is the default layer. No symbology when not following layer 2 or layer 3 information.

L2

EXAMPLE	- Text in layer 2

L3

EXAMPLE	- Text in layer 3

L1

EXAMPLE	- Text in layer 1 (as this text follows a text in layer 2 or 3, symbology "L1")

OPTIONAL EQUIPMENT

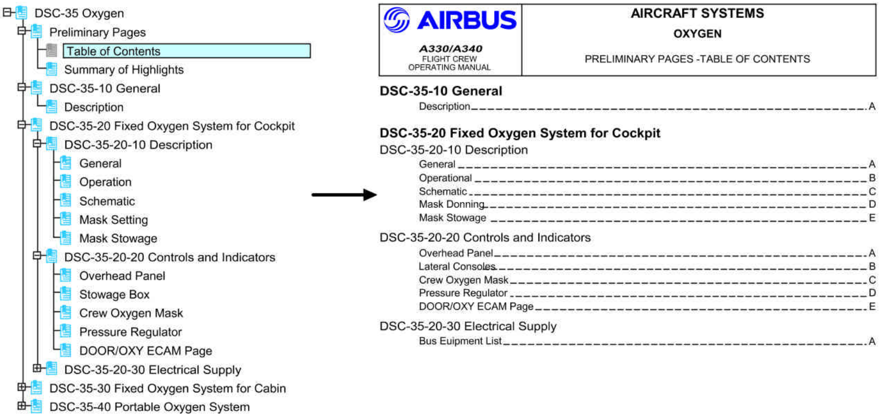
The legend ◁✻ (if installed) indicates that a paragraph or an illustration is applicable only if the related optional equipment is installed.

FCOM FORMAT AND STYLE INFORMATION - PAPER ONLY

Ident.: GEN-00013880.0001001 / 09 NOV 20
Applicable to: ALL

TABLE OF CONTENTS

Each TOC entry has an alphabetical index that identifies this TOC entry within its subsection. The manual user can easily find a TOC entry content within the manual thanks to this alphabetical index and the subsection identification. Both are indicated in the TOC and both cross-refer to the paper page footer (see the TOC indexing part below).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AIRBUS
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FLIGHT CREW
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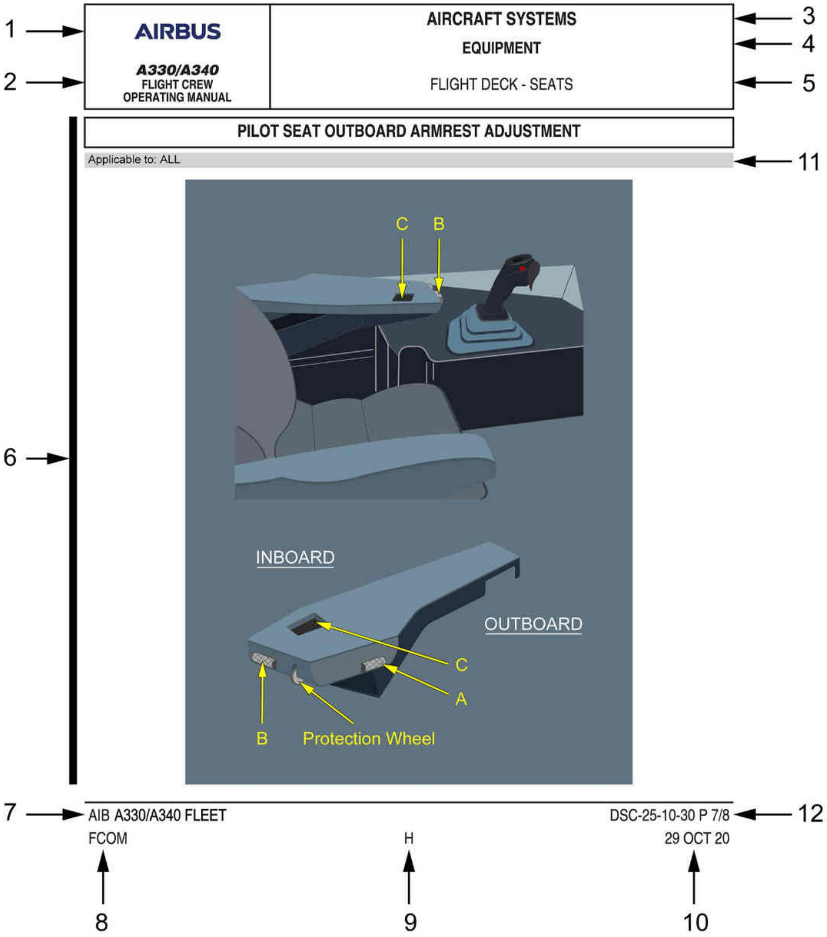
Bus Euipment List A

HEADER AND FOOTER



AIRBUS
A330/A340
FLIGHT CREW
OPERATING MANUAL

AIRCRAFT SYSTEMS
EQUIPMENT
FLIGHT DECK - SEATS

PILOT SEAT OUTBOARD ARMREST ADJUSTMENT

Applicable to: ALL

AIB A330/A340 FLEET
FCOM
H
DSC-25-10-30 P 7/8
29 OCT 20

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INBOARD
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Protection Wheel

1. Airline logo
2. Aircraft types and manual
3. Level 2 chapter (Section level 2 : GEN, DSC, PRO, LIM, PER)
4. Level 3 chapter
5. Level 4 chapter

6. Revision mark
7. Key product (document identification and aircraft designation)
8. Key product (manual code)
9. Page index
10. Last evolution date
11. Identification strip (list of impacted aircraft)
12. Section path

REVISION MARK

In the paper format, a vertical bar in the margin of the DU identifies the modified part. Each vertical bar has a numerical index that refers to the associated reason of the change in the Summary of Highlight.
This Summary of Highlight lists all the changes and associated reasons of the change (if necessary) that the revision has introduced.

TOC INDEXING

In the paper page footer, the TOC indexing is of the following type:

A	:	The paper page contains the whole "A" TOC entry content
A to B	:	The paper page contains the whole "A" and "B" TOC entries contents
A →	:	The "A" TOC entry content starts on this paper page and continues on the following paper page
← A	:	The "A" TOC entry content starts on a previous paper page and finishes on this paper page
← A →	:	The "A" TOC entry content starts on a previous paper page and continues on the following paper page
A to C→	:	The paper page contains the whole "A" and "B" TOC entries contents but the "C" TOC entry content starts on this paper page and continues on the following paper page
← A to C	:	The paper page contains the whole "B" and "C" TOC entries contents but the "A" TOC entry content starts on a previous paper page and finishes on this paper page
← A to C →	:	The paper page contains the whole "B" TOC entry content but the "A" TOC entry content starts on a previous paper page and finishes on this paper page and the "C" TOC entry content starts on this paper page and continues on the following paper page

Note: 1. *The indexes follow the alphabetical order: A, B, C, ..., Z, AA, AB, AC, ..., AZ, BA, BB, BC, ...*
2. *For each subsection, the index starts again from A.*
3. *When a TOC entry content continues on the following paper page, the text "Continued on the following page" is also indicated.*

FCOM REVISIONS

Ident.: GEN-00012546.0001001 / 09 NOV 20
Applicable to: ALL

FCOM REVISION

FCOM revisions are issued to add, update, or revise information. The Operator determines the revision periodicity.
When necessary, a revision may be issued in between the defined periodicity (e.g. need for urgent update).
A vertical bar appears to the left of all revised parts of the manual.

TEMPORARY INFORMATION

Some FCOM sections may need a temporary update (e.g. to explain a system behavior that will be modified by a future standard). In such cases, the applicable FCOM section is updated with a TDU.
Information contained in the TDU is highlighted in the manual and the initial content of the FCOM remains available for consultation and comparison and is highlighted (identification strip) as being impacted by the TDU.
A LEDU is provided in the FCOM.

OEB GENERAL DESCRIPTION

Applicable to: ALL

Ident.: GEN-A-00022618.0001001 / 09 NOV 20

DEFINITION

An Operations Engineering Bulletin is published to inform Operators of any deviations from initial design objectives that have a significant operational impact. An OEB provides the Operators with technical information and temporary operational procedures that take into account these deviations.

An OEB:
- Is temporary and usually focuses on one operational subject only
- Is included in the OEB section of the QRH so that the flight crew can easily access it
- At any time during the flight, if the OEB conditions are applicable, the flight crew must apply the operational procedure(s) that is in the QRH OEB section.

Ident.: GEN-A-00022619.0001001 / 09 NOV 20

TYPE OF OEB

OEBs can either be red or white, depending on their level of priority:
- RED OEBs are published to indicate that non-compliance with the recommended procedures may have a significant impact on the safe operation of the aircraft. The Operators shall provide all flight crews with these OEBs or their content without delay.
- WHITE OEBs are published to indicate that non-compliance with the recommended procedures may have a significant impact on aircraft operation. Airbus recommends that the Operators apply these OEBs within 30 days from the date of publication of these OEBs.

The information in OEBs is recommended by Airbus. If the OEB has an impact on the airworthiness of the aircraft, Airbus also issues a Temporary Revision of the Airplane Flight Manual. If the procedures contained in the red OEB differ from the procedures in the AFM TR, the approved AFM TR remains the reference.
Airbus recommends that all operators rapidly incorporate the corrective Service Bulletins that cancel the OEB when they become available.

Ident.: GEN-A-00022621.0001001 / 09 NOV 20

OEB CONTENT AND MANAGEMENT

OEB IN THE QRH

Each OEB includes all of the following items:
- The title of the OEB PROC
- The “ECAM ENTRY” field:
  This section identifies if one of the possible conditions to apply the OEB PROC is an ECAM warning/caution.
  The flight crew must disregard the ECAM procedure and/or STATUS of the ECAM alerts listed in the "ECAM ENTRY" field and must apply the QRH’s OEB procedure instead.
- The OEB operational procedure(s) that the flight crew must apply
- The technical explanation of the deviation from the initial design objectives.

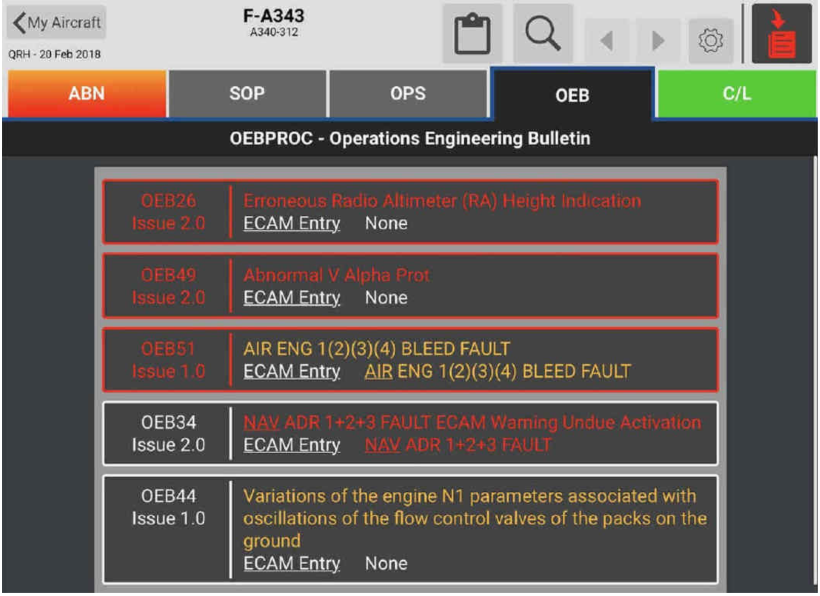
OEB IMMEDIATE ACTIONS

OEB Immediate Actions are actions that the flight crew must memorize, in order to be able to rapidly apply them, without referring the OEB.

OEB Immediate Actions are surrounded by a box in the OEB procedure, in order to enable the flight crew to easily identify them and are preceded by the phrase ‘IMMEDIATELY APPLY’.

QRH LIST OF EFFECTIVE OEBS

The LEOEB enables the flight crew to identify all the OEBs that are applicable to one specific aircraft.



OEBPROC - Operations Engineering Bulletin

OEB26 Issue 2.0	Erroneous Radio Altimeter (RA) Height Indication ECAM Entry None
OEB49 Issue 2.0	Abnormal V Alpha Prot ECAM Entry None
OEB51 Issue 1.0	AIR ENG 1(2)(3)(4) BLEED FAULT ECAM Entry AIR ENG 1(2)(3)(4) BLEED FAULT
OEB34 Issue 2.0	NAV ADR 1+2+3 FAULT ECAM Warning Undue Activation ECAM Entry NAV ADR 1+2+3 FAULT
OEB44 Issue 1.0	Variations of the engine N1 parameters associated with oscillations of the flow control valves of the packs on the ground ECAM Entry None

The QRH LEOEB includes:

- The "identification" field that identifies the OEB number and its issue number. The identification number and title of red OEBs are in red font in the eQRH. The identification number and title of white OEBs are in white font in the eQRH. This identification field enables the flight crew to easily identify the applicable OEBs before flights.

  Note: *OEBs are listed in numerical order and red OEBs are displayed before white OEBs.*

- The "Title" field provides the OEB title and the "ECAM Entry" part of the OEB PROC. This enables the flight crew to easily identify the ECAM procedure that is affected by the OEB.

CAUTION	When Airbus provides the Operator with the LEOEB, the information “ECAM Entry ” does not necessarily mean that (for Operators that use the OEB REMINDER function) the Operator’s maintenance personnel activated the OEB REMINDER codes for this OEB onboard the aircraft. It is the Operator’s responsibility to define a suitable process to provide the flight crew with confirmation that the OEB REMINDER codes are activated for the ECAM alerts affected by OEBs.

TDU GENERAL DESCRIPTION

Ident.: GEN-00023996.0001001 / 29 NOV 19
Applicable to: ALL

A TDU in the FCOM informs the flight crew about a temporary change in a normal Standard Operation Procedure, Advisory or Limitations. The TDU contains the reason for change in order to better understand and memorize this temporary change.

The TDU contains several indications:
- The date of application of the new or revised content
- The reason for change explains why the section is updated with a short general description of the malfunction
- The yellow dash line indicates the affected documentary unit
- When applicable, the arrow link provides a link to the previous content.

TAB GENERAL DESCRIPTION

Ident.: GEN-00023997.0001001 / 29 NOV 19
Applicable to: ALL

A TAB is a description of a system behavior that temporarily deviates from the intended system design and that the flight crew can notice.
The TAB enables the flight crew to better recognize, understand and if applicable, react to the abnormal system behavior in order to avoid any undue operational delay.
When applicable, temporary abnormal behaviors are described in the related section of the Aircraft System in a dedicated product folder identified as "Temporary Abnormal Behaviors".
Each TAB contains a description of the malfunction with an alternative instruction called "Operational recommendation" (if applicable).

ABBREVIATIONS

Ident.: GEN-00012475.0001001 / 28 NOV 23
Applicable to: ALL

A

Abbreviation	Term
A/BRK	Autobrake
A/C	Aircraft
A/SKID	Anti-skid
A/THR	AutoThrust
AA	Airworthiness Authorities
AAL	Above Aerodrome Level
AAP	Aft Attendant Panel
AAR	Air to Air Refueling
AAT	Aircraft Allocation Table
AB	Abort
ABN	Abnormal
ABV	Above
AC	Alternating Current
ACARS	Aircraft Communication Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ACC	Active Clearance Control
ACCEL	Acceleration
ACCU	Accumulator
ACCUR	Accuracy
ACD	Airworthiness Compliance Document
ACMS	Aircraft Condition Monitoring System
ACN	Aircraft Customer Number
ACP	Audio Control Panel
ACQ	Acquire
ACT	Additional Center Tank
ADF	Automatic Direction Finder
ADIRS	Air Data Inertial Reference System
ADIRU	Air Data Inertial Reference Unit
ADLU	Airborne Data Loading Unit
ADM	Air Data Module
ADR	Air Data Reference
ADS	Air Data System
ADS-B	Automatic Dependent Surveillance - Broadcast
ADS-C	Automatic Dependent Surveillance - Contract
ADT	Autonomous Distress Tracking
ADV	Advisory

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Abbreviation	Term
AEO	All Engines Operative
AEVC	Avionic Equipment Ventilation Controller
AFM	Airplane Flight Manual
AFS	Auto Flight System
AGL	Above Ground Level
AIDS	Aircraft Integrated Data System
AIL	Aileron
AIME	Autonomous Integrity Monitoring Extrapolation
AINS	Aircraft Information Network System
AIP	Attendant Indication Panel
ALT	Altitude
ALTN	Alternate
ALTSM	Altimeter Setting Monitor
AMI	Airline Modifiable Information
AMM	Aircraft Maintenance Manual
AMU	Audio Management Unit
ANSU	Aircraft Network Server Unit
ANT	Antenna
AOA	Angle Of Attack
AOC	Airline Operational Control
AP	Autopilot
APP	Approach
APPR	Approach
APPU	Assymetry Position Pick-off Unit
APU	Auxiliary Power Unit
AR	Authorization Required
ARINC	Aeronautical Radio Incorporated
ARPT	Airport
ASAP	As Soon As Possible
ASI	Air Speed Indicator
ATA	Air Transport Association of America
ATC	Air Traffic Control
ATIS	Automatic Terminal Information System
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications Network
ATS	Air Traffic Service
ATSAW	Airborne Traffic Situational Awareness
ATSU	Air Traffic Service Unit
ATT	Attitude
AUTO	Automatic

Continued on the following page

Continued from the previous page

Abbreviation	Term
AVNCS	Avionics
AWY	Airway

B

Abbreviation	Term
B/C	Back Course
BARO	Barometric
BAT	Battery
BBAND	Broadband
BCL	Battery Charge Limiter
BCM	Back-up Control Module
BCRC	Bulk Crew Rest Compartment
BFO	Beat Frequency Oscillator
BITE	Built-In Test Equipment
BLW	Below
BMC	Bleed Monitoring Computer
BNK	Bank
BRG	Bearing
BRK	Brake
BRT	Bright
BSCU	Braking Steering Control Unit
BTC	Bus Tie Contactor
BTL	Bottle
BUS	Busbar
BUSS	Back Up Speed Scale

C

Abbreviation	Term
C/B	Circuit Breaker
C/L	Checklist
CAB	Cabin
CAM	Cabin Assignment Module
CAPT	Captain, Capture
CAS	Calibrated Airspeed
CAT	Category
CBMU	Circuit Breaker Monitoring Unit
CCB	Cargo Control Box
CCD	Cursor Control Device
CCL	Cargo Compartment Light
CCOM	Cabin Crew Operating Manual

Continued on the following page

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Abbreviation	Term
CCRC	Cabin Crew Rest Compartment
CDA	Continuous Descent Approach
CDAS	Cargo Door Actuation System
CDL	Configuration Deviation List
CDLS	Cockpit Door Locking System
CDSS	Cockpit Door Surveillance System
CDU	Control Display Unit
CED	Cooling Effect Detector
CF	Cost of Fuel
CG	Center of Gravity
CH	Channel
CHG	Change
CI	Cost Index
CIDS	Cabin Intercommunication Data System
CIDS-SDF	Cabin Intercommunication Data System - Smoke Detection Function
CINS	Cabin Information Network System
CIV	Civilian
CKPT	Cockpit
CL	Climb, Checklist
CLB	Climb
CLR	Clear
CM1	Crewmember 1 (left seat)
CM2	Crewmember 2 (right seat)
CMC	Central Maintenance Computer
CMS	Central Maintenance System, Constant Mach Segment
CO	Company
COM	Communication
COND	Conditioning
CONF	Configuration
CONT	Continuous
CO RTE	Company Route
CP	Control Panel
CPC	Cabin Pressure Controller
CPCS	Cabin Pressure Control System
CPDLC	Controller-Pilot DataLink Communication
CRC	Continuous Repetitive Chime
CRG	Cargo
CRS	Course
CRZ	Cruise
CSAS	Conditioned Service Air System

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Abbreviation	Term
CSM/G	Constant Speed Motor/Generator
CST	Constraint
CSTR	Constraint
CT	Cost of Time
CTL	Control
CTLR	Controller
CTR	Center
CV	Check Valve
CVR	Cockpit Voice Recorder

D

Abbreviation	Term
DA	Drift Angle
DASM	Doors Actuators Symmetry Monitoring
DBUS	Digital BackUp Speed
DC	Direct Current
DCDU	Datalink Control and Display Unit
DCLB	Derated Climb
DCMS	Doors Control and Monitoring System
DCV	Double Check Valve
DDRMI	Digital Distance and Radio Magnetic Indicator
DECEL	Deceleration
DES	Descent
DEST	Destination
DET	Detection
DEU	Decoder/Encoder Unit
DFDR	Digital Flight Data Recorder
DH	Decision Height
DIR	Direction
DISC	Disconnect
DIST	Distance
DL	Digital Cabin Logbook
DLSU	Data Loading Selector Unit
DMC	Display Management Computer
DME	Distance Measuring Equipment
DMU	Data Management Unit (Aids)
DN	Down
DOLLI	Dome LED Light
DPO	Descent Profile Optimization
DSCS	Door Slide Control System

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Abbreviation	Term
DTG	Distance To Go
DTO	Derated Takeoff
DU	Display Unit, Documentary Unit

E

Abbreviation	Term
E/WD	Engine/Warning Display
EBCU	Emergency Braking Control Unit
ECAM	Electronic Centralized Aircraft Monitoring
ECB	Electronic Control Box (APU)
ECMU	Elec Contactor and Management Unit
ECON	Economic
ECP	ECAM Control Panel
ECS	Environmental Control System
ECU	Engine Control Unit
EDP	Engine-Driven Pump
EEC	Engine Electronic Control
EFB	Electronic Flight Bag
EFCS	Electronic Flight Control System
EFIS	Electronic Flight Instruments System
EFOB	Estimated Fuel On Board
EGPWS	Enhanced Ground Proximity Warning System
EGT	Exhaust Gas Temperature
EIS	Electronic Instruments System
EIU	Engine Interface Unit
EIVMU	Engine Interface and Vibration Monitoring Unit
ELAN	Ethernet Local Area Network
ELEC	Electricity
ELEV	Elevator, Elevation
ELMU	Electrical Load Management Unit
ELT	Emergency Locator Transmitter
EMER	Emergency
EMER GEN	Emergency Generator
EMP	Electric Motor Pump
ENG	Engine
EO	Engine-Out
EOSID	Engine-Out Standard Instrument Departure
EPE	Estimated Position Error (equal to EPU)
EPR	Engine Pressure Ratio
EPU	Emergency Power Unit, Estimated Position Uncertainty (equal to EPE)

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Abbreviation	Term
ESS	Essential
ESV	Electrical Selector Valve
ETA	Estimated Time of Arrival
ETOPS	Extended Twin Operations
ETP	Equal Time Point
ETT	Estimated Time for Takeoff
EWD	Engine/Warning Display
EXT	External
EXTN	Extension

F

Abbreviation	Term
F	Fuel
F/CTL	Flight Control
F/O	First Officer
FAA	Federal Aviation Administration
FADEC	Full Authority Digital Engine Control System
FAF	Final Approach Fix
FANS	Future Air Navigation System
FAP	Forward Attendant Panel
FAR	Federal Aviation Regulations
FAS	Final Approach Segment
FAV	Fan Air Valve
FCDC	Flight Control Data Concentrator
FCMC	Fuel Control and Monitoring Computer
FCMS	Fuel Control and Monitoring System
FCOM	Flight Crew Operating Manual
FCPC	Flight Control Primary Computer
FCRC	Flight Crew Rest Compartment
FCSC	Flight Control Secondary Computer
FCTM	Flight Crew Techniques Manual
FCU	Flight Control Unit
FD	Flight Director
FDIMU	Flight Data Interface and Management Unit
FDIU	Flight Data Interface Unit
FDP	Final Descent Point
FDU	Fire Detection Unit
FE	Flight Envelope
FF	Fuel Flow
FG	Flight Guidance

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Abbreviation	Term
F-G/S	FLS Glide Slope
FIDS	Fault Isolation and Detection System
FL	Flight Level
FLD	Factored In-Flight Landing Distance
FLEX	Flexible
FLIS	Floor Level Indication System
F-LOC	FLS Localizer
FLS	FMS Landing System
FLT	Flight
FLX	Flexible
FLX TO	Flexible Takeoff
FM	Flight Management
FMA	Flight Mode Annunciator
FMGC	Flight Management and Guidance Computer
FMGEC	Flight Management Guidance and Envelope Computer
FMGES	Flight Management Guidance and Envelope System
FMGS	Flight Management and Guidance System
FMS	Flight Management System
FOB	Fuel On Board
FOD	Foreign Object Damage
FOM	Figure Of Merit
FPA	Flight Path Angle
FPD	Flight Path Director
F-PLN	Flight Plan
FPPU	Feedback Position Pick-off Unit
FPV	Flight Path Vector
FQI	Fuel Quantity Indication
FREQ	Frequency
FRV	Fuel Return Valve
FSV	Fuel Shutoff Valve
FTIS	Fuel Tank Inerting System
FU	Fuel Used
FWC	Flight Warning Computer
FWD	Forward
FWS	Flight Warning System

G

Abbreviation	Term
G/S	Glideslope
GA	Go-Around

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Abbreviation	Term
GAPCU	Ground and Auxiliary Power Control Unit
GCU	Generator Control Unit
GDU	Group of Documentary Unit
GE	General Electric
GEN	Generator
GES	Ground Earth Station
GLC	Generator Line Contactor
GLS	GBAS Landing System, GNSS Landing System
GMT	Greenwich Mean Time
GND	Ground
GNSS	Global Navigation Satellite System
GPCU	Ground Power Control Unit
GPIRS	Global Positioning and Inertial Reference System
GPS	Global Positioning System
GPSSU	Global Positioning System Sensor Unit
GPU	Ground Power Unit
GPWS	Ground Proximity Warning System
GRND	Ground
GRU	Ground Refiguration Unit
GRVTY	Gravity
GS	Ground Speed
GW	Gross Weight

H

Abbreviation	Term
HCU	Hydraulic Control Unit, HUD Combiner Unit
HDG	Heading
HF	High Frequency
HI	High
HIL	Hold Item List
HLD	Hold
HM	Holding Pattern with a Manual Termination
HMU	Hydro-Mechanical Unit
HP	High Pressure
HPA	Hectopascal
HPFD	Harmonized Primary Flight Display
HPTCC	High Pressure Turbine Clearance Control
HPV	High Pressure Valve
HSMU	Hydraulic System Monitoring Unit
HUD	Head Up Display
HYD	Hydraulic

I

Abbreviation	Term
I/P	Input or Intercept Profile
IAS	Indicated Airspeed
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IDENT	Identification
IDG	Integrated Drive Generator
IFE	In Flight Entertainment
IFR	Instrument Flight Rules
IGGS	Inert Gas Generation System
IGN	Ignition
ILF	Integrated Loading Facilities
ILFLE	Integrated Loading Facilities Loading Equipment
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IMM	Immediate
INB	Inbound
INIT	Initialization
INOP	Inoperative
INR	Inner
INT	Interphone, Internal, Integrated, Interior
IP	Intermediate Pressure
IPPU	Instrumentation Position Pick-off Unit
IR	Inertial Reference
IRS	Inertial Reference System
ISA	International Standard Atmosphere
ISIS	Integrated Standby Instrument System
ISOL	Isolation
ISPSS	In Seat Power Supply System
ISPSU	In-Seat Power Supply Unit
ITP	In Trail Procedure

J

Abbreviation	Term
JAR	Joint Airworthiness Requirements

K

Abbreviation	Term

L

Abbreviation	Term
L	Left
L/DEV	Lateral Deviation
L/G	Landing Gear
LAL	Loading Area Light
LAN	Local Area Network
LAT	Latitude
LAT REV	Lateral Revision
LAV	Lavatory
LCD	Liquid Crystal Display
LD	Lower Deck
LDA	Localizer Directional Aid, Landing Distance Available
LDG	Landing
LED	Light Emitting Diode
LEDU	List of Effective Documentary Units
LEOEB	List of Effective Operations Engineering Bulletins
LESS	List of Effective Section/Subsections
LGCIU	Landing Gear Control and Interface Unit
LH	Left-Hand
LIB	Loudspeaker and Indicator Box
LIM	Limitation
LK	Lock
LNAV	Lateral Navigation
LO	Low
LOC	Localizer
LONG	Longitude
LP	Localizer Performance, Low Pressure
LPC	Low Pressure Compressor
LPTCC	Low Pressure Turbine Clearance Control
LPV	Localizer Performance with Vertical Guidance
LRU	Line Replaceable Unit
LS	Landing System, Loudspeaker
LSK	Line Select Key

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Abbreviation	Term
LT	Light
LTS	Load and Trim Sheet
LVL	Level
LVL/CH	Level Change
LVR	Lever
LW	Landing Weight

M

Abbreviation	Term
MAC	Mean Aerodynamic Chord
MAG	Magnetic
MAINT	Maintenance
MAN	Manual
MAP	Missed Approach Point
MAX	Maximum
MCDU	Multipurpose Control and Display Unit
MCT	Maximum Continuous Thrust
MD	Main Deck
MDA	Minimum Descent Altitude
MDCC	Main Deck Cargo Compartment
MDCD	Main Deck Cargo Door
MDCLS	Main Deck Cargo Loading System
MDDU	Multifunction Disk Drive Unit
MDH	Minimum Descent Height
MEA	Minimum En Route Altitude
MECH	Mechanic
MED	Medium
MEL	Minimum Equipment List
MIN	Minimum
MKR	Marker
MLA	Maneuver Load Alleviation
MLG	Main Landing Gear
MLS	Microwave Landing System
MLW	Maximum Landing Weight
MMEL	Master Minimum Equipment List
MMO	Maximum Operating Mach
MMR	Multi Mode Receiver
MN	Mach number
MNPS	Minimum Navigation Performance Specification
MOD	Modification

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Abbreviation	Term
MORA	Minimum Off Route Altitude
MORV	Mixer Overpressure Relief Valve
MP	Modification Proposal
MSA	Minimum Safe Altitude
MSG	Message
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
MZFW	Maximum Zero Fuel Weight

N

Abbreviation	Term
N/A	Not Applicable
N/W	Nose Wheel
N1	Low Pressure Rotor Speed (in %)
N2	Intermediate Pressure Rotor Speed (in %) for Rolls Royce Engines High Pressure Rotor Speed (in %) for Other Engines
N3	High Pressure Rotor Speed (in %) for Rolls Royce Engines
NACA	National Advisory Committee for Aeronautics
NAV	Navigation
NAVAID	Navigation Aid
NBPT	No Break Power Transfer
NCD	Non Computed Data
ND	Navigation Display
NDB	Non Directional Beacon — Nav Database
NORM	Normal
NPA	Non-Precision Approach
NW	Nosewheel
NWS	Nosewheel Steering

O

Abbreviation	Term
OANS	On-board Airport Navigation System
OAT	Outside Air Temperature
OCL	Oceanic Clearance
OEB	Operations Engineering Bulletin
OEI	One Engine Inoperative
OFST	Offset
OIT	Onboard Information Terminal
OLB	OPS Library Browser
OMTS	On-Board Mobile Telephony System

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Abbreviation	Term
OP	Open
OPS	Operations
OPT	Optimum
OVBD	Overboard
OVHD	Overhead
OVHT	Overheat
OVRD	Override
OXY	Oxygen

P

Abbreviation	Term
P/B	Push Button
P/N	Part Number
PA	Passenger Address
PAX	Passenger
PBCS	Performance-Based Communication and Surveillance
PBD	Place/Bearing/Distance
PBE	Protective Breathing Equipment
PCU	Power Control Unit
PD	Place/Distance
PDU	Power Drive Unit
PED	Pedestal, Portable Electronic Device
PERF	Performance
PES	Passenger Entertainment System
PF	Pilot Flying
PFD	Primary Flight Display
PHC	Probes Heat Computer
PIM	Programming and Indication Module
PLU	Power Locking Unit
PM	Pilot Monitoring
PN	Part Number
POB	Pressure Off Brake
POS	Position
PPOS	Present Position
PR	Pressure
PRED	Prediction
PRESS	Pressure, Pressurization
PRIM	FLT CTL Primary Computer (FCPC)
PROC	Procedure
PROG	Progress

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Abbreviation	Term
PROT	Protection
PRV	Pressure Regulating valve
PSCU	Proximity Switch Control Unit
PT	Point
PTA	Passive Turbulence Alleviation
PTLU	Pedal Travel Limiter Unit
PTT	Push To Talk
PVI	Paravisual Indicator
PW	Pratt & Whitney
PWR	Power
PWS	Predictive Windshear System, Portable Water System

Q

Abbreviation	Term
QAR	Quick Access Recorder
QCCU	Quantity Calculation and Control Unit
QFE	Field Elevation Atmosphere Pressure
QFU	Runway Heading
QNH	Sea Level Atmosphere Pressure
QRH	Quick Reference Handbook
QT	Quart (US)
QTY	Quantity

R

Abbreviation	Term
R	Right
RA	Radio Altimeter, Resolution Advisory
RAAS	Runway Awareness and Advisory System
RAD	Radio
RAIM	Receiver Autonomous Integrity Monitoring
RAT	Ram Air Turbine
RCAM	Runway Assessment Condition Matrix
RCDR	Recorder
RCL	Recall
RCP	Required Communication Performance
RCVR	Receiver
REC	Recovery, Recommended
RED	Reduction
REF	Reference
REG	Regulation

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Abbreviation	Term
REV	Reverse
RH	Right-Hand
RLD	Required Landing Distance
RMP	Radio Management Panel
RNAV	Area Navigation
RNG	Range
RNP	Required Navigation Performance
ROP	Runway Overrun Prevention
ROPS	Runway Overrun Prevention System
ROW	Runway Overrun Warning
RPCU	Residual Pressure Control Unit
RPM	Revolution Per Minute
RPTG	Repeating, Reporting
RQRD	Required
RR	Rolls Royce
RSP	Required Surveillance Performance
RSV	Reserves
RSVR	Reservoir
RTA	Required Time of Arrival
RTE	Route
RTO	Rejected Takeoff
RTOW	Regulatory Takeoff Weight
RUD	Rudder
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RWY	Runway
RWYCC	Runway Condition Code

S

Abbreviation	Term
S	South
S/C	Step Climb
S/D	Shut Down, Step Descent
S/F	Slats/Flaps
SAAAR	Special Aircrew and Aircraft Authorization Required
SAR	Search And Rescue
SAT	Static Air Temperature, Satellite
SATCOM	Satellite Communication
SB	Service Bulletin
SBAS	Satellite Based Augmentation System

Continued on the following page

Continued from the previous page

Abbreviation	Term
SC	Single Chime
SD	System Display
SDAC	System Data Acquisition Concentrator
SDCU	Smoke Detection Control Unit
SDF	Smoke Detection Function, Simplified Directional Facility
SEC	FLT CTL Secondary Computer (FCSC)
SEL	Selector
SELCAL	Selective Calling
SFCC	Slat/Flap Control Computer
SID	Standard Instrument Departure
SIU	Server Interface Unit
SLS	SBAS Landing System
SOP	Standard Operating Procedure
SPD	Speed
SPD LIM	Speed Limit
SPLR	Spoiler
SQWK	Squawk
SRS	Speed Reference System
STAR	Standard Terminal Arrival Route
STAT	Static
STBY	Standby
STD	Standard
STRG	Steering
STS	Status
SWTG	Switching
SYS	System

T

Abbreviation	Term
T.O	Take Off
T.O.	Takeoff
T/C	Top of Climb
T/D	Top of Descent
T2CAS	Traffic Alert and Collision Avoidance System
T3CAS	Traffic Alert and Collision Avoidance System
TA	Traffic Advisory
TAB	Temporary Abnormal Behavior
TACAN	Tactical Air Navigation
TACS	Taxi Aid Camera System
TAS	True Air Speed

Continued on the following page

Continued from the previous page

Abbreviation	Term
TAT	Total Air Temperature
TAU	Time to intercept
TAWS	Terrain Awareness and Warning System
TBD	To Be Determined
TBV	Transient Bleed Valve
TCAS	Traffic Alert and Collision Avoidance System
TCM	Thrust Control Malfunction
TCU	Transport Cargo Unit
TDU	Temporary Documentary Unit
TEL	Telephone
TEMP	Temperature
TFLEX	Flexible Temperature
TGT	Target
THR	Thrust
THRT	Threat
THS	Trimmable Horizontal Stabilizer
TK	Tank, Track angle
TLA	Throttle Lever Angle
TLU	Travel Limitation Unit
TMPY	Temporary
TMR	Timer
TO	Takeoff
TOGA	Takeoff - Go-Around
TOGW	Takeoff Gross Weight
TOS	Takeoff Surveillance
TOW	Takeoff Weight
T-P	Turn Point
TPIS	Tire Pressure Indicating System
TR	Transformer Rectifier Unit
TRANS	Transition
TRK	Track
TROPO	Tropopause
TRV	Travel
TSM	Trouble Shooting Manual
TTG	Time to Go
TVMC	Minimum Control Speed Temperature
TWLU	Terminal Wireless LAN Unit
TWY	Taxiway

U

Abbreviation	Term
ULB	Underwater Locator Beacon
ULD	Unit Load Device
UNLK	Unlock
UP	Up, Upper
USB	Universal Serial Bus
UTC	Universal Coordinated Time

V

Abbreviation	Term
V/S	Vertical Speed
V1	Decision Speed
V2	Takeoff Safety Speed
VAPP	Approach Speed
VBV	Variable Bypass Valve
VCC	Video Control Center
VDEV	Vertical Deviation
VENT	Ventilation
VERT	Vertical
VERT REV	Vertical Revision
VFE	Maximum Speed for each Flap configuration
VFTO	Final Takeoff Speed
VHF	Very High Frequency
VIB	Vibration
VIP	Vertical Intersection Point
VLE	Maximum Landing Gear Extended Speed
VLS	Lowest Selectable Speed
VLV	Valve
VM	Maneuvering Speed
VMAX	Maximum Allowable Speed
VMC	Visual Meteorological Conditions
VMCA	Minimum Control Speed in the Air
VMCG	Minimum Control Speed on Ground
VMCL	Minimum Control Speed at Landing
VMCL-2	Minimum control speed at landing with 2 engines inop on one wing
VMIN	Minimum Operating Speed
VMO	Maximum Operating Speed
VMU	Minimum Unstick Speed
VNAV	Vertical Navigation
VOR	VHF Omnidirectional Range

Continued on the following page

Continued from the previous page

Abbreviation	Term
VOR-D	VOR-DME
VR	Rotation Speed
VREF	Landing Reference Speed
VS	Reference Stalling Speed
VS1G	Stall Speed at 1g load factor
VSA	Visual Separation on Approach
VSI	Vertical Speed Indicator
VSV	Variable Stator Vane
VSW	Stall Warning Speed
VU	Virtual Unit

W

Abbreviation	Term
W/S	Wind Shear
WARN	Warning
WBM	Weight and Balance Manual
WBS	Weight and Balance System
WD	Warning Display
WHC	Window Heat Computer
WPT	Waypoint
WTB	Wing Tip Brake
WXR	Weather Radar

X

Abbreviation	Term
XFR	Transfer
XPDR	Transponder
xLS	x Landing System (e.g. ILS, GLS, ...)
XTK	Crosstrack Error

Y

Abbreviation	Term

Z

Abbreviation	Term
ZFCG	Zero Fuel Center of Gravity
ZFW	Zero Fuel Weight
ZFWCG	Zero Fuel Weight Center of Gravity

SYMBOLS

Abbreviation	Term
<	less than
>	more than
≤	less than or equal to
≥	more than or equal to
=	equal to

AIRCRAFT SYSTEMS

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DSC-20 Aircraft General

DSC-21 Air Conditioning / Pressurization / Ventilation

DSC-22_10 Auto Flight - General

DSC-22_20 Auto Flight - Flight Management

DSC-22_30 Auto Flight - Flight Guidance

DSC-22_40 Auto Flight - Flight Envelope

DSC-22_45 Auto Flight - AOC Functions

DSC-22_46 Auto Flight - Print Interface

DSC-23 Communications

DSC-24 Electrical

DSC-25 Equipment

DSC-26 Fire Protection

DSC-27 Flight Controls

DSC-28 Fuel

DSC-29 Hydraulic

DSC-30 Ice and Rain Protection

DSC-31 Indicating/Recording Systems

DSC-32 Landing Gear

DSC-33 Lights

DSC-34-10 Navigation

Continued on the following page

Continued from the previous page

DSC-34-20 Surveillance

DSC-35 Oxygen

DSC-36 Pneumatic

DSC-38 Water / Waste

DSC-45 Maintenance System

DSC-46 Information System

DSC-49 APU

DSC-52 Doors

DSC-56 Cockpit Windows

DSC-70 Engines

AIRCRAFT SYSTEMS

PRELIMINARY PAGES

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

M	Localization	DU Title	DU identification	DU date

No Temporary Documentary Unit

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AIRCRAFT SYSTEMS

AIRCRAFT GENERAL

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DSC-20-10 Overview

General....A
Engines....B
Cockpit....C
Cabin....D
Cargo....E

DSC-20-20 Description

General Arrangement....A
Principal Dimensions....B
Unpressurized Compartments....C
Antenna Locations....D
Ground Service Connections and Panels....E

DSC-20-30 Ground Handling

Taxiing....A
180 degrees Turn on Runway....B

DSC-20-40 Ground Clearance Diagram

Ground Clearance Diagram....A

DSC-20-50 Landing Geometry

ILS Final Approach and Landing Geometry....A
Minimum Visual Ground Segments (Flare Phase)....B

DSC-20-60 Visual Ground Geometry

Visual Ground Geometry....A

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Localization Title	Toc Index	ID	Reason
DSC-20-30 Taxiing	A	1	Effectivity update: The information no longer applies to LV-KAO.
DSC-20-30 Taxiing	A	2	Effectivity update: The information now also applies to LV-KAO.
DSC-20-30 180 degrees Turn on Runway	B	3	Effectivity update: The information no longer applies to LV-KAO.
DSC-20-30 180 degrees Turn on Runway	B	4	Effectivity update: The information now also applies to LV-KAO.

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GENERAL

Ident.: DSC-20-10-00000707.0002001 / 16 MAR 11
Applicable to: ALL

The A330 is a subsonic, medium to long range, civil transport aircraft.

ENGINES

Ident.: DSC-20-10-00000710.0002001 / 16 MAR 11
Applicable to: ALL

The aircraft has two high bypass turbofan engines, mounted under the wings.

COCKPIT

Ident.: DSC-20-10-00000711.0001001 / 16 MAR 11
Applicable to: ALL

The cockpit is arranged for a two-member crew, and also has a place for two observers.

CABIN

Ident.: DSC-20-10-00000716.0009001 / 05 FEB 15
Applicable to: ALL

The layout for cabin occupants seating may be varied to suit operating requirements.

CARGO

Ident.: DSC-20-10-00000715.0001001 / 21 MAR 16
Applicable to: ALL

Three cargo compartments are under the cabin floor.

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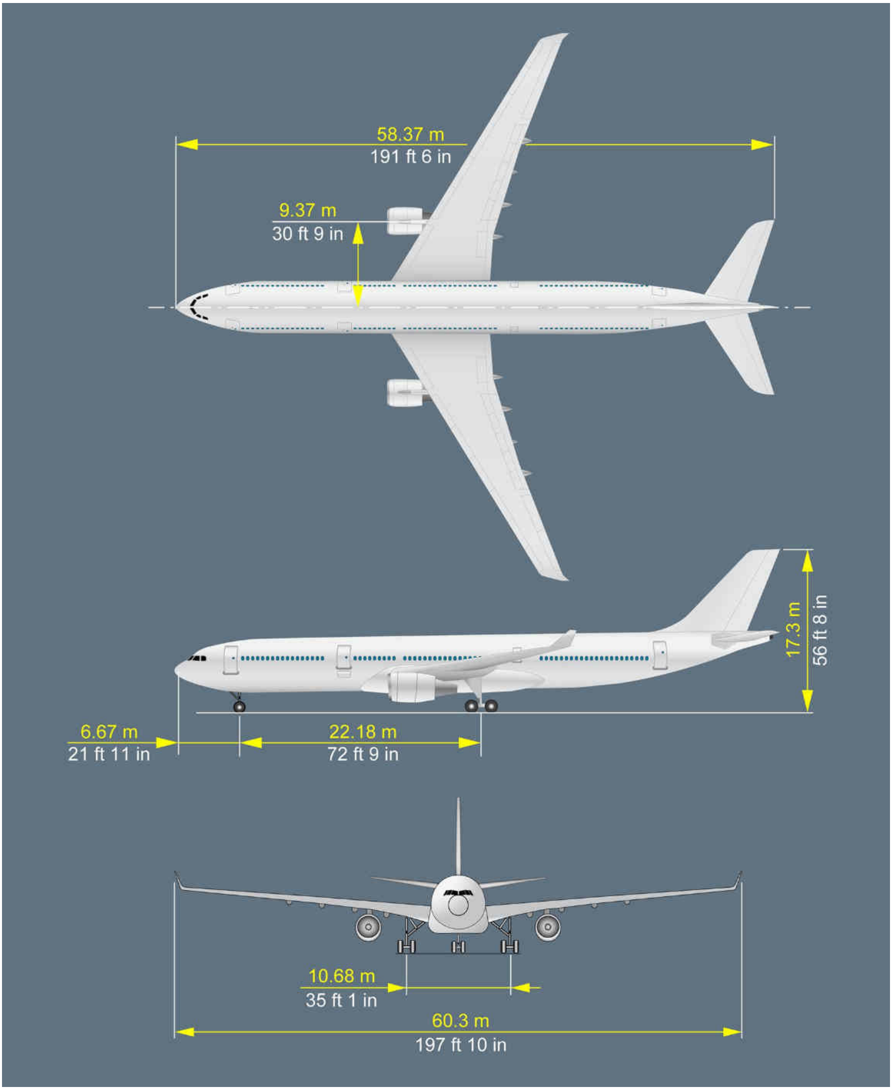
GENERAL ARRANGEMENT

Ident.: DSC-20-20-00000717.0001001 / 21 MAR 16
Applicable to: ALL

This subchapter gives the principal dimensions of the aircraft, the location of unpressurized areas, antennas, ground service connections and the ground maneuvering characteristics.

PRINCIPAL DIMENSIONS

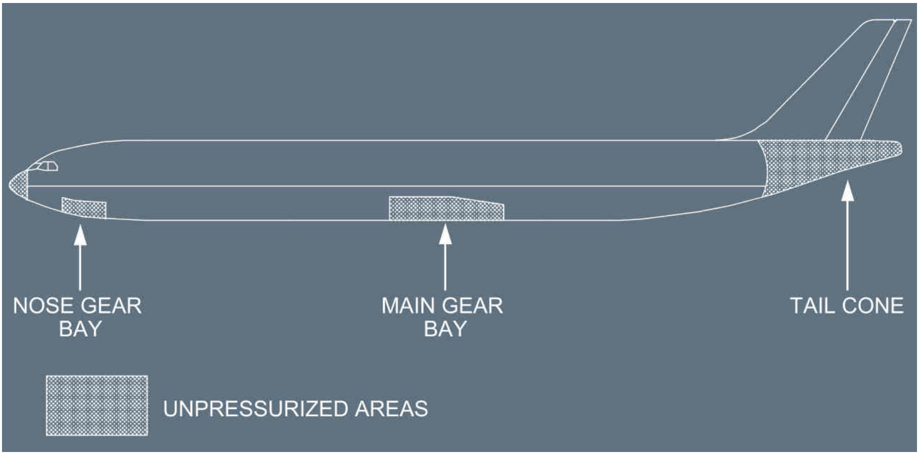
Ident.: DSC-20-20-00000766.0007001 / 28 MAY 20


58.37 m
191 ft 6 in
9.37 m
30 ft 9 in
17.3 m
56 ft 8 in
6.67 m
21 ft 11 in
22.18 m
72 ft 9 in
10.68 m
35 ft 1 in
60.3 m
197 ft 10 in

UNPRESSURIZED COMPARTMENTS

Ident.: DSC-20-20-00000767.0001001 / 22 MAY 12

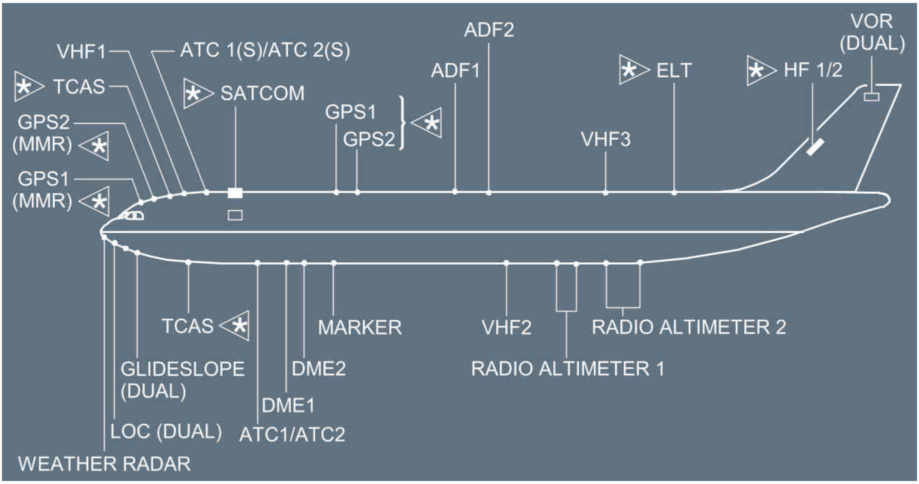
Applicable to: ALL


NOSE GEAR BAY
MAIN GEAR BAY
TAIL CONE
UNPRESSURIZED AREAS

ANTENNA LOCATIONS

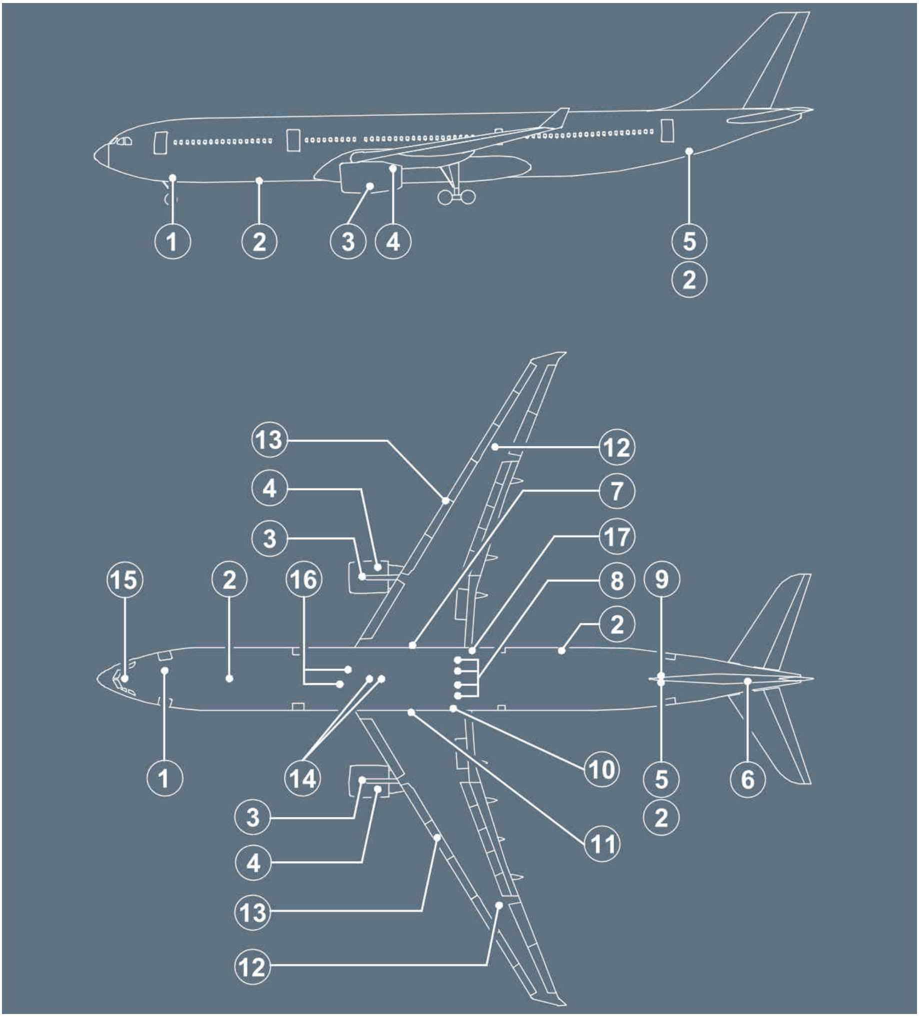
Ident.: DSC-20-20-00000769.0003001 / 22 MAY 12

Applicable to: ALL


VHF1
ATC 1(S)/ATC 2(S)
TCAS
SATCOM
GPS2 (MMR)
GPS1 (MMR)
ADF2
ADF1
GPS1
GPS2
ELT
HF 1/2
VOR (DUAL)
VHF3
TCAS
MARKER
VHF2
RADIO ALTIMETER 2
GLIDESLOPE (DUAL)
DME2
RADIO ALTIMETER 1
DME1
LOC (DUAL)
ATC1/ATC2
WEATHER RADAR

GROUND SERVICE CONNECTIONS AND PANELS

Ident.: DSC-20-20-00000771.0003001 / 22 MAY 12
Applicable to: ALL


1
2
3
4
5
2
13
4
3
15
2
16
12
7
17
8
9
2
1
14
3
4
13
12
10
11
5
2
6

(1) External ground power panel receptacle

(2) Remote water drain

(3) IDG oil filling

(4) Engine oil filling

(5) Potable water filling

(6) APU oil filling

(7) Hydraulic ground power (yellow)

(8) Air charging for hydraulic accumulators

(9) Toilet servicing

(10) Hydraulic reservoir filling and ground power (green)

(11) Hydraulic reservoir pressurization and ground power (blue)

(12) Fuel gravity filling

(13) Refuel/defuel couplings

(14) HP ground air supply connectors

(15) Oxygen system

(16) LP ground air supply connectors

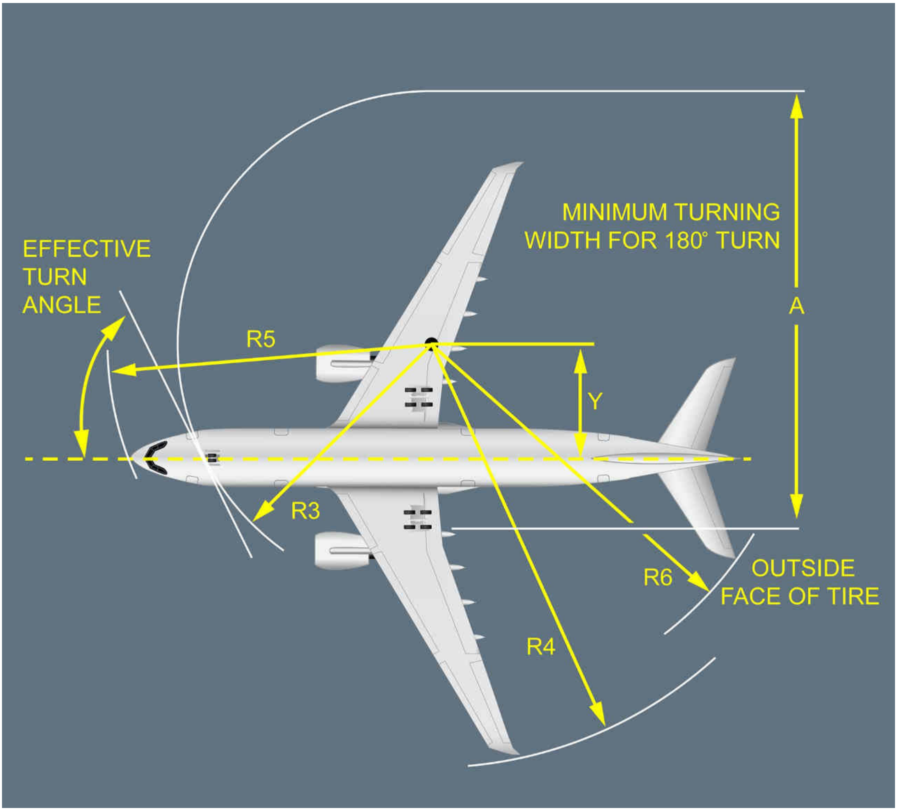
(17) Refuel/Defuel control panel

TAXIING

Ident.: DSC-20-30-00000770.0010001 / 03 NOV 21

1 **Applicable to: LV-KAN**

MINIMUM TURNING RADII


MINIMUM TURNING
WIDTH FOR 180° TURN
EFFECTIVE
TURN
ANGLE
R5
A
Y
R3
R6
OUTSIDE
FACE OF TIRE
R4

NWS limit angle	Y	A	R3	R4	R5	R6
72 °	12 m 39 ft	44 m 144 ft	25 m 82 ft	43 m 141 ft	31 m 101 ft	37 m 121 ft

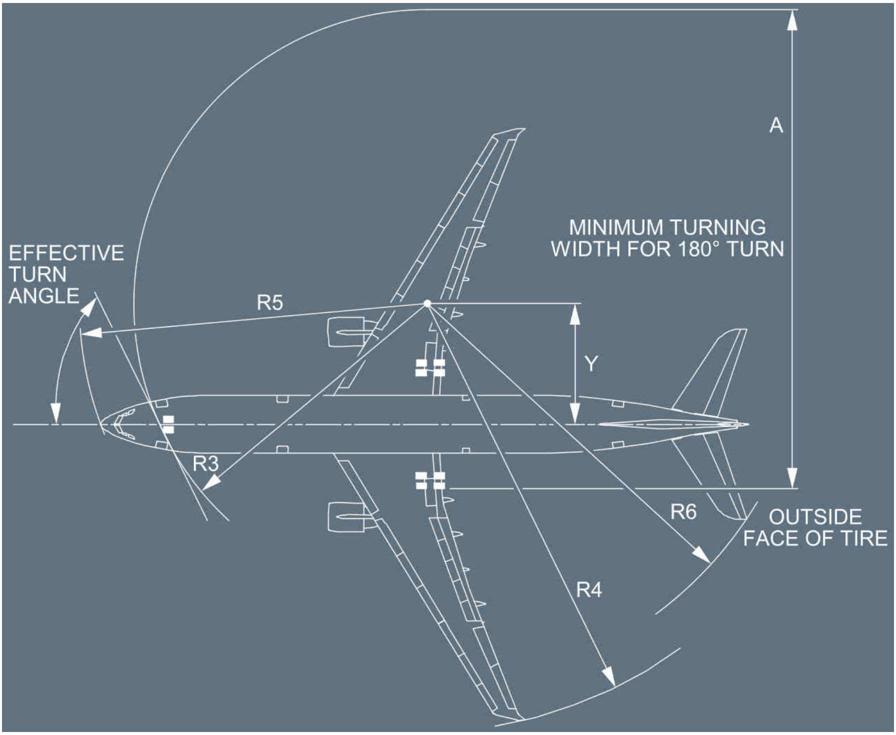
The above figure assume symmetric thrust and no differential braking.

TAXIING

Ident.: DSC-20-30-00000770.0011001 / 06 JUN 17

2 **Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU**

MINIMUM TURNING RADII


A
MINIMUM TURNING WIDTH FOR 180° TURN
EFFECTIVE TURN ANGLE
R5
Y
R3
R6
OUTSIDE FACE OF TIRE
R4

NWS limit angle	Y	A	R3	R4	R5	R6
65 °	13 m 43 ft	46 m 151 ft	26 m 85 ft	44 m 144 ft	32 m 105 ft	37 m 121 ft

The above figure assume symmetric thrust and no differential braking.

180 DEGREES TURN ON RUNWAY

Ident.: DSC-20-30-00021547.0004001 / 17 MAY 21

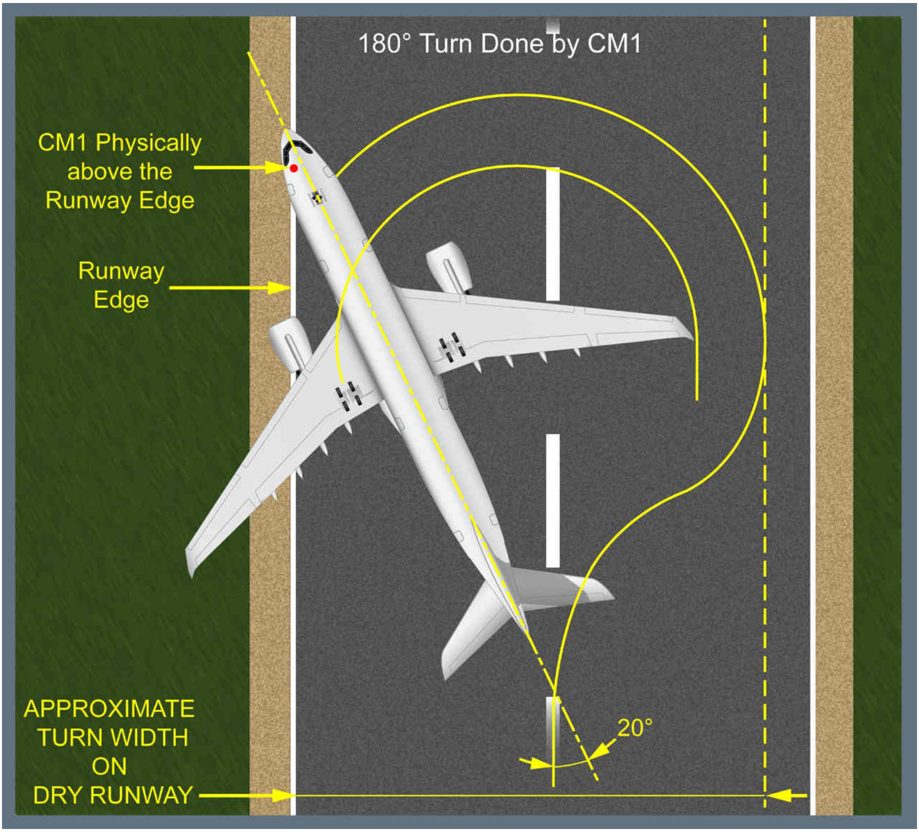
3 **Applicable to: LV-KAN**

With the recommended 180 ° turn technique, on dry runway, with the maximum nosewheel steering of 72 °, the approximate turn width is:

- For the A330-200, 41 m (133 ft) without margin
- For the A330-300, 48 m (156 ft) without margin.

Note: *The flight crew should consider additional margin when the runway is wet or contaminated.*

For more info on the recommended 180 ° turn technique, *Refer to FCTM/PR-NP-SOP-100 180 degrees Turn on Runway*.


180° Turn Done by CM1
CM1 Physically above the Runway Edge
Runway Edge
APPROXIMATE TURN WIDTH ON DRY RUNWAY
20°

180 DEGREES TURN ON RUNWAY

Ident.: DSC-20-30-00021547.0003001 / 06 JUN 17

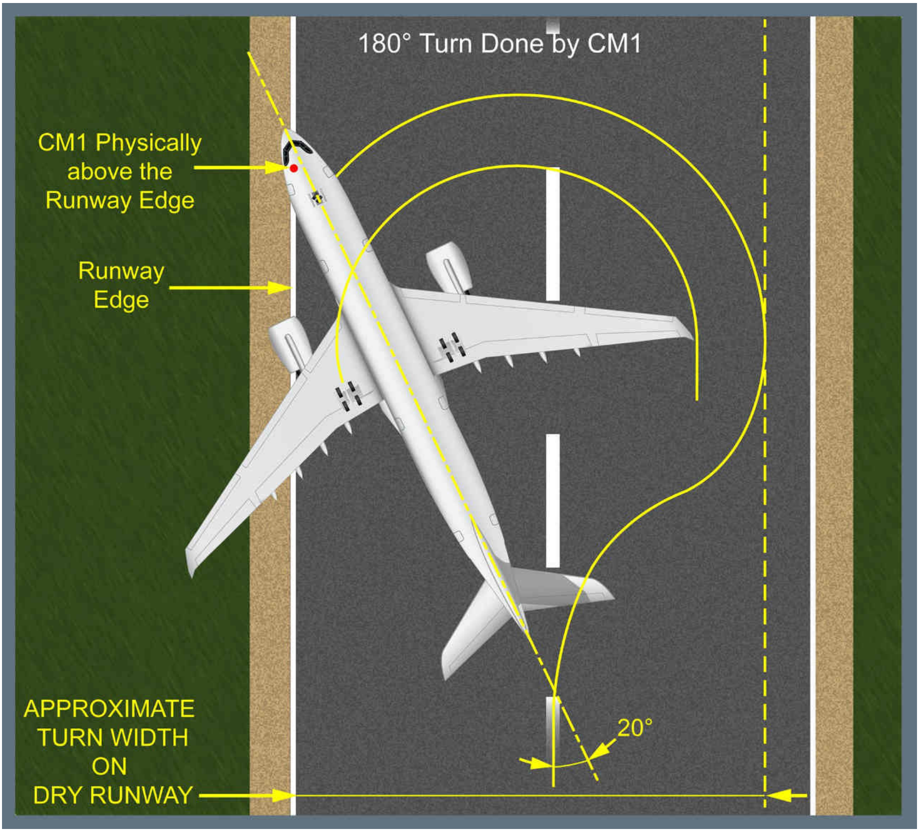
4 **Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU**

With the recommended 180 ° turn technique, on dry runway, with the maximum nosewheel steering of 65 °, the approximate turn width is:

- For the A330-200, 43 m (142 ft) without margin
- For the A330-300, 53 m (174 ft) without margin.

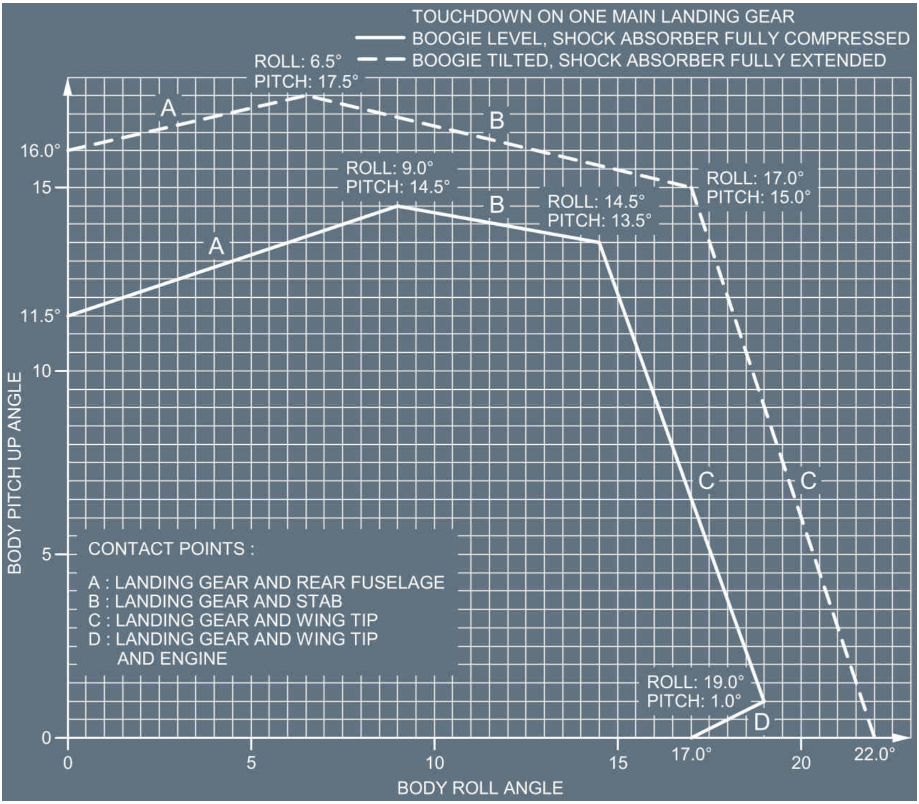
Note: *The flight crew should consider additional margin when the runway is wet or contaminated.*

For more info on the recommended 180 ° turn technique, *Refer to FCTM/PR-NP-SOP-100 180 degrees Turn on Runway*.


180° Turn Done by CM1
CM1 Physically above the Runway Edge
Runway Edge
APPROXIMATE TURN WIDTH ON DRY RUNWAY
20°

GROUND CLEARANCE DIAGRAM

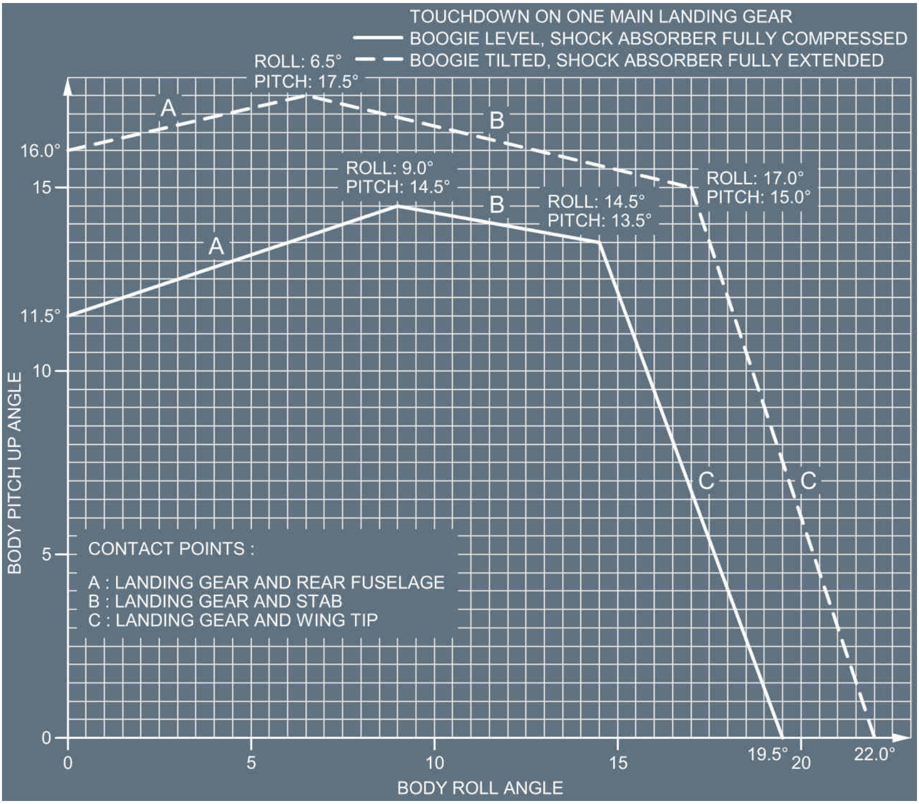
Ident.: DSC-20-40-00018979.0002001 / 19 JAN 16
Applicable to: LV-KHT, LV-KHU



GROUND CLEARANCE DIAGRAM

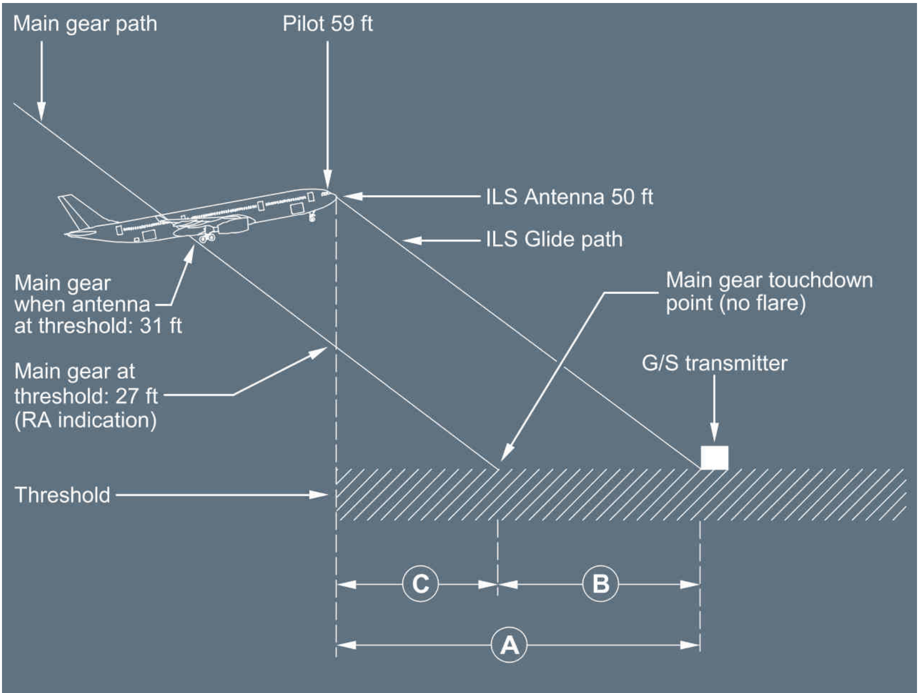
Ident.: DSC-20-40-00018979.0001001 / 19 JAN 16

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO



ILS FINAL APPROACH AND LANDING GEOMETRY

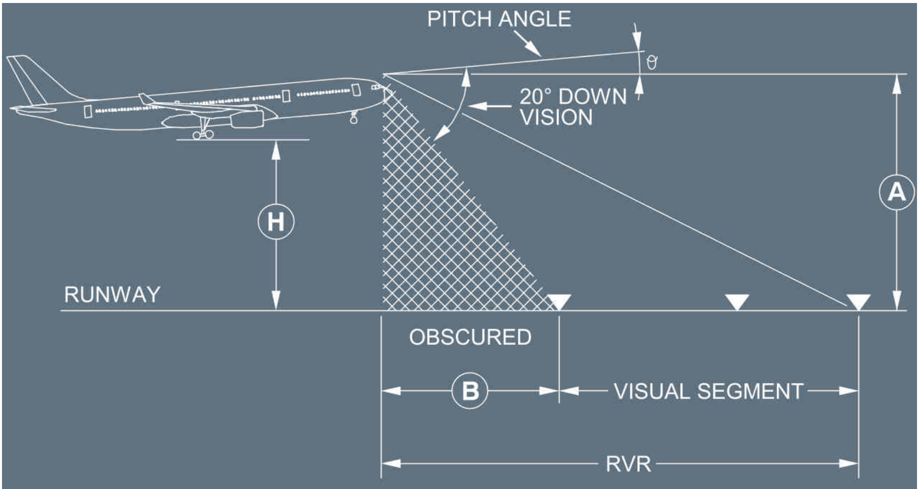
Ident.: DSC-20-50-00011999.0004001 / 09 OCT 12
Applicable to: ALL


Main gear path
Pilot 59 ft
ILS Antenna 50 ft
ILS Glide path
Main gear when antenna at threshold: 31 ft
Main gear touchdown point (no flare)
G/S transmitter
Main gear at threshold: 27 ft (RA indication)
Threshold
C
B
A

CONDITIONS :	GLIDE PATH (°)	Ⓐ	Ⓑ	TOUCHDOWN POINT Ⓒ
- FLAPS FULL - ILS ANTENNA AT 50 ft AT THRESHOLD - NO FLARE - PITCH ANGLE : 5°	2°5	349 m 1145 ft	161 m 530 ft	185 m 615 ft
	3°	291 m 954 ft	140 m 457 ft	152 m 497 ft

MINIMUM VISUAL GROUND SEGMENTS (FLARE PHASE)

Ident.: DSC-20-50-00012001.0005001 / 09 OCT 12
Applicable to: ALL

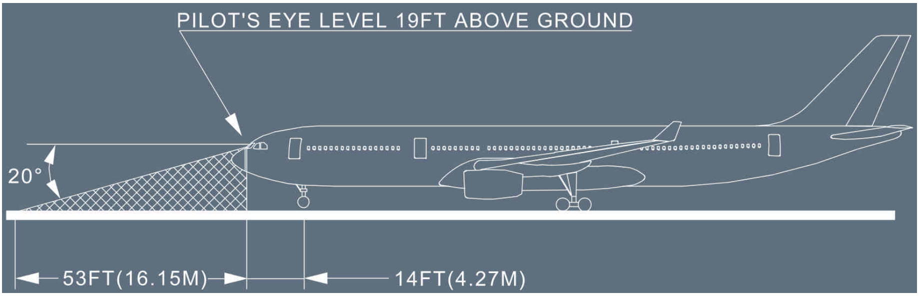

PITCH ANGLE
θ
20° DOWN
VISION
A
H
RUNWAY
OBSCURED
B
VISUAL SEGMENT
RVR

	CAT III		CAT II
H	15 ft (θ = 5°1)	50 ft (θ = 5°)	100 ft (θ = 5°)
VISUAL SEGMENT	60 m (197 ft)		120 m (394 ft)
A	47 ft	82 ft	132 ft
OBSCURED B	54 m (177 ft)	93 m (306 ft)	150 m (493 ft)
MINIMUM RVR	114 m (374 ft)	153 m (503 ft)	270 m (887 ft)

Note: *This drawing illustrates that, for a CAT III landing (60 m minimum visual segment), the minimum RVR is 114 m at 15 ft.*

VISUAL GROUND GEOMETRY

Ident.: DSC-20-60-00011958.0001001 / 17 AUG 10
Applicable to: ALL


PILOT'S EYE LEVEL 19FT ABOVE GROUND
20°
53FT(16.15M)
14FT(4.27M)

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AIRCRAFT SYSTEMS

AIR CONDITIONING / PRESSURIZATION / VENTILATION

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DSC-21-10 Air Conditioning

DSC-21-10-10 General

General ..... A
Architecture ..... B

DSC-21-10-20 Main Components

Air Conditioning Pack ..... A
Pack Schematic ..... B
Pack Flow Control Valve C
Emergency Ram Air ..... D
Mixer Unit ..... E
Hot Air Valves ..... F
Trim Air Valves ..... G
Hot Air X Valve ..... H

DSC-21-10-30 Temperature and Flow Regulation

General ..... A
System Operation ..... B
Pack Controller C
Zone Controller ..... D
Temperature Regulation ..... E
Cabin Temperature Selection ..... F
Cockpit Crew - Individual Heaters ..... G

DSC-21-10-40 System Operation under Failure Condition

General ..... A
Zone Controller ..... B
Pack Controllers C
Air Cycle Machine Failure ..... D
Hot Air Valves Failure ..... E
Trim Air Valve Failure ..... F

DSC-21-10-50 Controls and Indicators

Overhead Panel ..... A
Overhead Panel (Cont'd) ..... B
FWD Attendant Panel C
Additional Attendant Panel ..... D
ECAM BLEED Page ..... E
ECAM COND Page ..... F
ECAM CAB PRESS Page ..... G
ECAM CRUISE Page ..... H
Memo Display I

Continued on the following page

Continued from the previous page

DSC-21-20 Pressurization

DSC-21-20-10 General

General....A
Automatic Operation....B
Manual Operation....C
Schematics....D

DSC-21-20-20 Main Components

Cabin Pressure Controllers....A
Outflow Valves....B
Safety Valves....C
Negative Relief Valve....D
Residual Pressure Control Unit (RPCU)....E
Pressurization Flight Profile....F

DSC-21-20-30 System Operation

Automatic Pressure Control Mode....A
Maximum Differential Pressure Limiter Function....B
Manual Pressure Control Mode....C
Ditching....D
Prevention of Pressurization with a Door not Closed and Locked....E

DSC-21-20-40 Controls and Indicators

Overhead Panel....A
ECAM CAB PRESS Page....B
ECAM CRUISE Page....C
ECAM Door/OXY Page....D
Memo Display....E

DSC-21-30 Ventilation

DSC-21-30-10 General

General....A

DSC-21-30-20 Avionics Ventilation

General....A
Main Components....B
Schematics....C
System Operation....D

DSC-21-30-30 Avionics Ground Cooling

General....A

Continued on the following page

Continued from the previous page

DSC-21-30-40 Battery Ventilation

Battery Ventilation....A

DSC-21-30-50 Lavatory and Galley Ventilation

Lavatory and Galley Ventilation....A

DSC-21-30-70 Pack Bay Ventilation

Pack Bay Ventilation....A

DSC-21-30-80 Controls and Indicators

Overhead Panel....A
ECAM CAB PRESS Page....B

DSC-21-40 Cargo

DSC-21-40-10 General

General....A

DSC-21-40-20 System Operation

Bulk Cargo Compartment....A
FWD Cargo Compartment....B
Schematic....C

DSC-21-40-30 Controls and Indicators

Overhead Cargo Air COND Panel....A
Overhead Maintenance Panel....B
ECAM COND Page....C

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GENERAL

Ident.: DSC-21-10-10-00018213.0008001 / 21 MAR 16
Applicable to: ALL

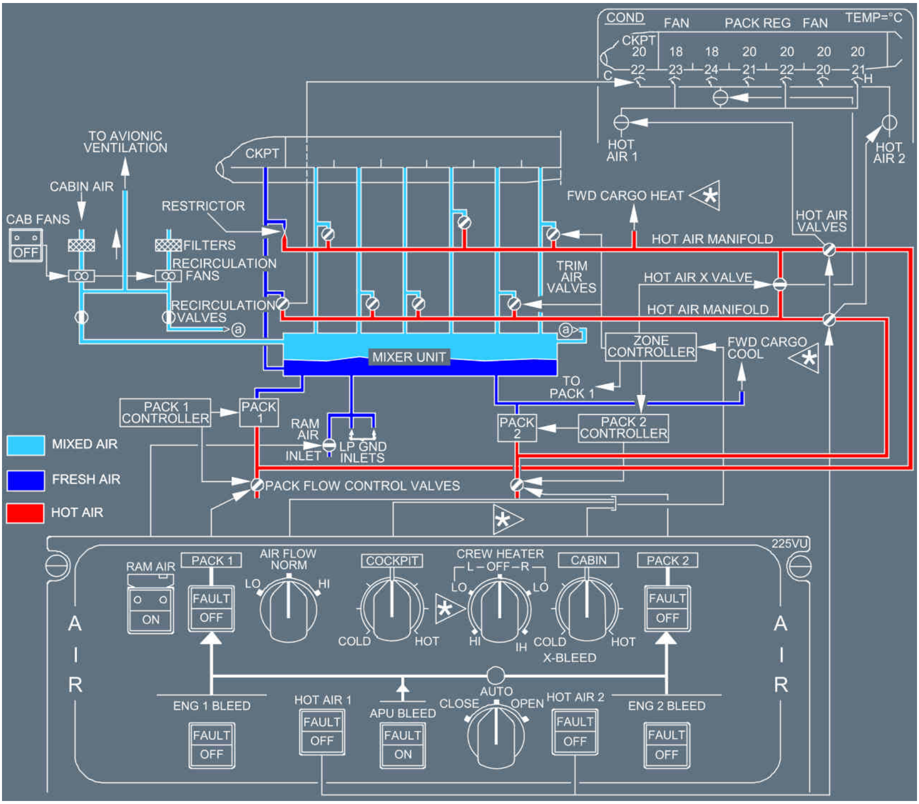
The air conditioning system is fully automatic.
It provides continuous air renewal and maintains a constant selected temperature in the cockpit and cabin zones, which are independently controlled.

Air is supplied by the pneumatic system, via :
- Two pack flow control valves,
- Two packs,
- The mixing unit, which mixes air coming from both the cabin and the packs.

It is then distributed to the cockpit and the cabin.
Temperature regulation is optimized via two hot air pressure regulating valves and the trim air valves, that add hot air tapped upstream of the packs to the mixing unit air, via the two hot air manifolds.
In an emergency, a ram air inlet can provide ambient air to the mixing unit.
Temperature regulation is controlled by a zone controller and two pack controllers. Flight deck and cabin temperature can be selected from the AIR panel in the cockpit.
Electrical heating of side window blow air ⪡ provides individual heating of the cockpit's left or right-hand side.
A control panel is provided on the Forward Attendant Panel (FAP). During cruise, the cabin crew can modify each cabin zone temperature from the control panel, with a limited authority of ± 3 °C (5.4 °F).
Low pressure air is supplied to the mixing unit via a ground connection.

ARCHITECTURE

Ident.: DSC-21-10-10-00000774.0004001 / 22 MAY 12
Applicable to: ALL


COND
FAN
PACK REG
FAN
TEMP=°C
CKPT
20
18
18
20
20
20
20
C
22
23
24
21
22
20
21
H
HOT AIR 1
HOT AIR 2
TO AVIONIC VENTILATION
CKPT
CABIN AIR
CAB FANS
OFF
RESTRICTOR
FILTERS
RECIRCULATION FANS
RECIRCULATION VALVES
a
a
FWD CARGO HEAT
HOT AIR VALVES
HOT AIR MANIFOLD
TRIM AIR VALVES
HOT AIR X VALVE
HOT AIR MANIFOLD
MIXER UNIT
ZONE CONTROLLER
FWD CARGO COOL
TO PACK 1
PACK 1 CONTROLLER
PACK 1
RAM AIR INLET
LP GND INLETS
PACK 2
PACK 2 CONTROLLER
MIXED AIR
FRESH AIR
HOT AIR
PACK FLOW CONTROL VALVES
225VU
RAM AIR
ON
PACK 1
FAULT
OFF
AIR FLOW
NORM
LO
HI
COCKPIT
COLD
HOT
CREW HEATER
L – OFF – R
LO
LO
HI
IH
CABIN
COLD
HOT
PACK 2
FAULT
OFF
X-BLEED
A I R
A I R
ENG 1 BLEED
FAULT
OFF
HOT AIR 1
FAULT
OFF
APU BLEED
FAULT
ON
AUTO
CLOSE
OPEN
HOT AIR 2
FAULT
OFF
ENG 2 BLEED
FAULT
OFF

AIR CONDITIONING PACK

Ident.: DSC-21-10-20-00000775.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

The two packs operate automatically and independently of each other. Pack operation is controlled by the pack controller.
Warm pre-conditioned bleed air enters the cooling path via the pack flow control valve and is ducted to the primary heat exchanger.
Then, the cooled bleed air enters the compressor section of the aircycle machine and is compressed to a higher pressure and temperature.
It is again cooled in the main heat exchanger, and enters the turbine section where it expands. In expanding, it generates power to drive the compressor and cooling air fan.
The removal of energy during this process reduces the air temperature, resulting in a very low air temperature at turbine discharge.
The temperature control valve can modify the pack outlet temperature by adding uncooled air to the turbine outlet flow.
In case of an air cycle machine failure, a by pass valve allows the bleed air to be cooled by the corresponding heat exchanger only.

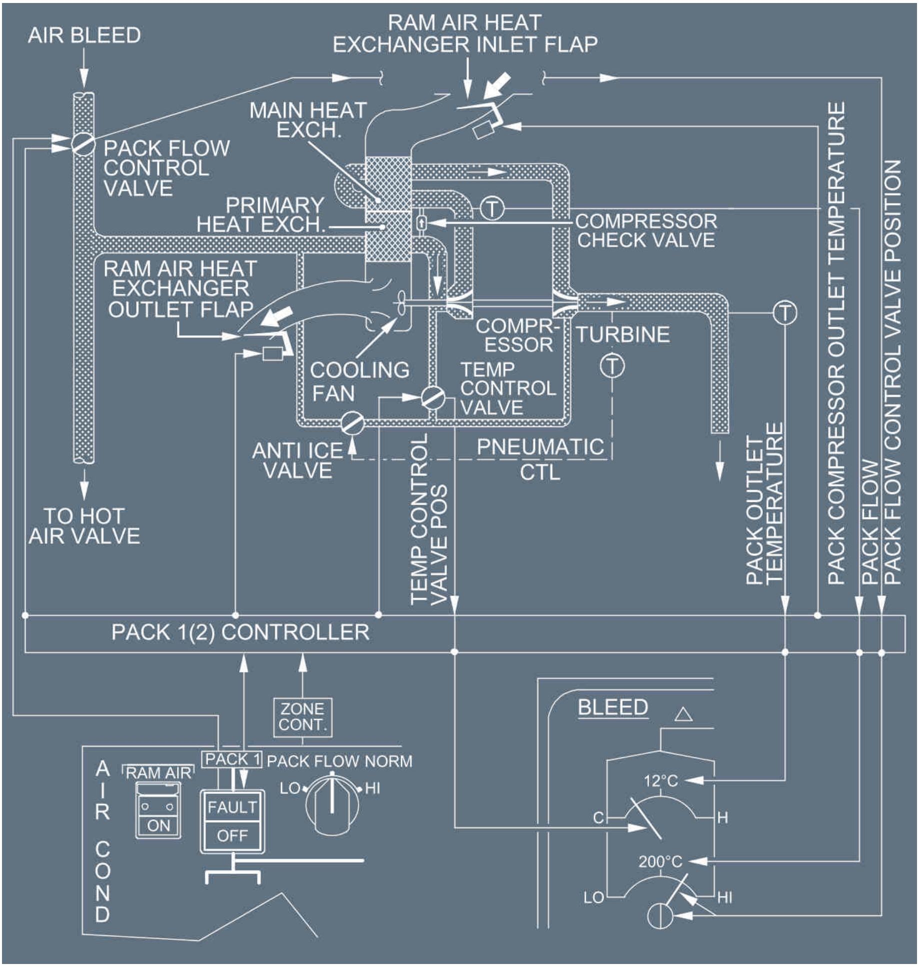
AIR CONDITIONING PACK

Ident.: DSC-21-10-20-00000775.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The two packs operate automatically and independently of each other. Pack operation is controlled by the pack controller.
Warm pre-conditioned bleed air enters the cooling path via the pack flow control valve and is ducted to the primary heat exchanger.
Then, the cooled bleed air enters the compressor section of the aircycle machine and is compressed to a higher pressure and temperature.
It is again cooled in the main heat exchanger, and enters the turbine section where it expands. In expanding, it generates power to drive the compressor and cooling air fan.
The removal of energy during this process reduces the air temperature, resulting in a very low air temperature at turbine discharge.
The temperature control valve can modify the pack outlet temperature by adding uncooled air to the turbine outlet flow.
In case of an air cycle machine failure, bleed air is only cooled by the corresponding heat exchanger only.

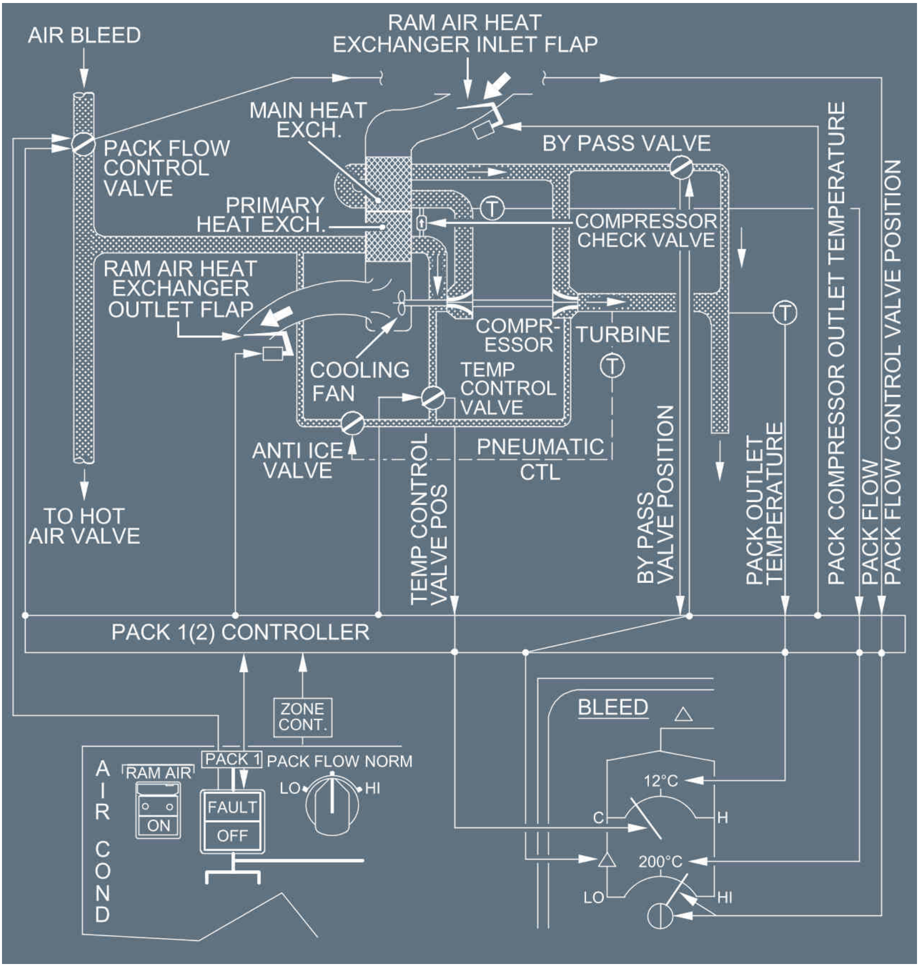
PACK SCHEMATIC

Ident.: DSC-21-10-20-00000777.0005001 / 31 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


AIR BLEED
RAM AIR HEAT EXCHANGER INLET FLAP
MAIN HEAT EXCH.
PACK FLOW CONTROL VALVE
PRIMARY HEAT EXCH.
T
COMPRESSOR CHECK VALVE
RAM AIR HEAT EXCHANGER OUTLET FLAP
COMPR-ESSOR
TURBINE
T
T
COOLING FAN
TEMP CONTROL VALVE
ANTI ICE VALVE
PNEUMATIC CTL
TO HOT AIR VALVE
TEMP CONTROL VALVE POS
PACK OUTLET TEMPERATURE
PACK COMPRESSOR OUTLET TEMPERATURE
PACK FLOW
PACK FLOW CONTROL VALVE POSITION
PACK 1(2) CONTROLLER
ZONE CONT.
AIR COND
RAM AIR
ON
PACK 1
FAULT
OFF
PACK FLOW NORM
LO
HI
BLEED
12°C
C
H
200°C
LO
HI

PACK SCHEMATIC

Ident.: DSC-21-10-20-00000777.0001001 / 09 OCT 12
Applicable to: LV-GKO, LV-GKP


AIR BLEED
RAM AIR HEAT EXCHANGER INLET FLAP
MAIN HEAT EXCH.
PACK FLOW CONTROL VALVE
BY PASS VALVE
PRIMARY HEAT EXCH.
COMPRESSOR CHECK VALVE
RAM AIR HEAT EXCHANGER OUTLET FLAP
COMPR-ESSOR
TURBINE
COOLING FAN
TEMP CONTROL VALVE
ANTI ICE VALVE
PNEUMATIC CTL
TO HOT AIR VALVE
TEMP CONTROL VALVE POS
BY PASS VALVE POSITION
PACK OUTLET TEMPERATURE
PACK COMPRESSOR OUTLET TEMPERATURE
PACK FLOW
PACK FLOW CONTROL VALVE POSITION
T
PACK 1(2) CONTROLLER
ZONE CONT.
AIR COND
RAM AIR
ON
PACK 1
FAULT
OFF
PACK FLOW NORM
LO
HI
BLEED
12°C
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200°C
LO
HI

PACK FLOW CONTROL VALVE

Ident.: DSC-21-10-20-00000778.0001001 / 30 AUG 18
Applicable to: ALL

This valve is pneumatically-operated and electrically-controlled. It regulates the air flow in accordance with signals received from the pack controller.
In the absence of air pressure, a spring keeps the valve closed.
In the absence of electrical supply, the valve is open in a position equivalent to the HIGH selection, provided air supply is available.
The valve closes automatically in case of pack overheating (on ground only), engine starting, operation of the fire or ditching pushbuttons, any unclosed doors at engine start, or insufficient upstream pressure. The valve is controlled from the AIR panel.

EMERGENCY RAM AIR

Ident.: DSC-21-10-20-00000779.0001001 / 11 JAN 17
Applicable to: ALL

An emergency ram air inlet ventilates the cockpit and cabin, if both packs fail.
The emergency ram air inlet valve is controlled by the RAM AIR pb on the AIR COND panel.
This pushbutton opens the ram air valve, provided that ditching is not selected.
The outflow valves open about 50 %, provided that they are under automatic control and ΔP is less than 1 PSI. They do not automatically open if they are under manual control, even if the ΔP is less than 1 PSI. If ΔP is greater than 1 PSI, the check valve, located downstream the ram air door, will not open. No airflow will then be supplied.

MIXER UNIT

Ident.: DSC-21-10-20-00000780.0001001 / 21 MAR 16
Applicable to: ALL

This unit mixes cold fresh air from the packs with the cabin air being recirculated through recirculation fans. The mixer unit is also connected to the emergency ram air inlet and the low pressure ground inlets.

Note: *In case both packs are inoperative, the recirculation valves are partially closed.*

HOT AIR VALVES

Ident.: DSC-21-10-20-00000781.0001001 / 21 MAR 16
Applicable to: ALL

These valves regulate the pressure of hot air, tapped upstream of the packs.

They are pneumatically-operated and electrically-controlled from the HOT AIR 1 and HOT AIR 2 pushbuttons on the AIR panel. In the absence of electrical supply, the hot air valves are closed. In the absence of air pressure, a spring keeps the valve closed.
The valve closes automatically, if the duct overheats.

TRIM AIR VALVES

Ident.: DSC-21-10-20-00000782.0001001 / 21 MAR 16
Applicable to: ALL

These valves are electrically-controlled by the zone controller. Trim air valves, associated with each zone, adjust the temperature by adding hot air from the two hot air manifolds.
For the cockpit supply, only one trim air valve is fitted to regulate air from the hot air manifold 2. Air from the hot air manifold 1 passes through a restrictor.

HOT AIR X VALVE

Ident.: DSC-21-10-20-00000783.0001001 / 21 MAR 16
Applicable to: ALL

A HOT AIR cross-valve is fitted between the two hot air manifolds. The valve is normally closed. It automatically opens, if one hot air supply fails.

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GENERAL

Ident.: DSC-21-10-30-00000784.0001001 / 21 MAR 16
Applicable to: ALL

Temperature regulation is automatic and controlled by one zone controller and two pack controllers.

SYSTEM OPERATION

Ident.: DSC-21-10-30-00020646.0002001 / 17 MAR 17
Applicable to: ALL

SYSTEM OPERATION

The cabin is divided into 3 temperature control zones : FWD, MID and AFT. The length of the three zones is, as far as practicable, adapted to the individual cabin class arrangement by respective programming of the CIDS.
The cockpit cabin temperature selector is used to select prior to flight a common cabin master temperature for all zones.
The common master temperature can be individually adapted for the three cabin zones at any time via the cabin temperature page of the Programming and Indication Modul (PIM) on the forward attendant panel. An individual zone correction up to +/– 3 °C (5.4 °F) can be selected for the FWD, MID or AFT cabin zones in steps of 0.5 °C (0.9 °F).

PACK CONTROLLER

Ident.: DSC-21-10-30-00000785.0003001 / 21 MAR 16
Applicable to: ALL

Each pack controller regulates the temperature of its associated pack, in accordance with a demand signal from the zone controller, by modulating the temperature control valve and the ram air inlet flaps and the ram air outlet flaps.
The ram air inlet and outlet flaps close during takeoff and landing to avoid ingestion of foreign objects.

Note: *During takeoff, the ram air inlet and outlet flaps close when the thrust lever is at or above CL detent.*
During landing, they close as soon as the landing gear is compressed, when the speed is at or above 70 kt.
They open, when the speed is below 70 kt, with a 10 s delay.

The pack controllers also provide flow regulation by modulating the associated pack flow control valve, in accordance with the zone controller demand.

ZONE CONTROLLER

Ident.: DSC-21-10-30-00018214.0004001 / 21 MAR 16
Applicable to: ALL

PACK FLOW CONTROL

The flight crew can use the PACK FLOW selector to adjust the pack flow for the number of passengers and the external conditions. When the selector is in the AUTO position ◁ , the air flow is automatically managed by the pack controller, depending on the number of passengers entered in the MCDU. However, the other positions can be selected to comply with warnings, cautions, or cabin needs.

Whatever the flight crew selects, the system receives a high flow demand for any of the following circumstances :
- Single pack operation, or
- When the APU is supplying bleed air.

Note: Due to ambient conditions, high flow may not be achieved.

ENGINE PRESSURE DEMAND

When the cooling demand in one zone cannot be satisfied, if the bleed pressure is too low, the zone controller sends a pressure demand signal to both engines' Engine Interface Units (EIU), in order to increase the minimum idle and to raise the bleed pressure.

APU FLOW DEMAND

When the APU bleed valve is open, the zone controller signals the APU Electronic Control Box (ECB) to increase the APU flow output when any zone temperature demand cannot be satisfied.

BLEED TEMPERATURE DEMAND

If the cooling demand cannot be satisfied, the zone controller signals the Bleed Monitoring Computer (BMC) to decrease the bleed temperature from normal (200 °C) to reduced setting (150 °C). This reduction is inhibited, if the wing-anti ice is ON.

TEMPERATURE REGULATION

Ident.: DSC-21-10-30-00000787.0001001 / 26 MAY 14
Applicable to: ALL

The zone controller regulates the cabin and cockpit temperature.

BASIC TEMPERATURE REGULATION

The flight crew uses the temperature selectors on the air conditioning panel in the cockpit to select the reference temperature. The flight attendant adjusts the cabin temperature from the Forward Attendant Panel (FAP).
An automatic temperature altitude correction may be added to the cockpit-selected temperature to compensate for the reduction in cabin air humidity and reduction of cabin lining temperatures. The altitude correction is proportional to the flight altitude and is programmable. The initial manufacturer setting is that no altitude correction is added.
The zone controller computes a temperature demand, depending on the selected temperature and the actual temperature.

The actual temperature is measured by sensors in the:
- Cockpit
- Lavatory extraction circuit and galley ventilation system for the cabin.

A signal corresponding to the lowest demanded zone temperature goes to the pack controller, which then makes both packs produce the required outlet temperature.

OPTIMIZED TEMPERATURE REGULATION

The zone controller optimizes temperature by acting on the trim air valves.
The cockpit crew can select temperatures between the range of 18 °C (64 °F) and 30 °C (86 °F).

CABIN TEMPERATURE SELECTION

Ident.: DSC-21-10-30-00020647.0001001 / 17 MAR 17
Applicable to: ALL

CABIN TEMPERATURE SELECTION

The system is designed to minimize flight crew workload. The cockpit and cabin selections should be set only once prior to flight. Throughout the flight the system takes care of cabin temperature regulation and under normal operating conditions there is no need to change the selection during flight.
It is recommended to follow these guidelines :

Note: *Any change of selection makes the system blow either colder or hotter air into the cabin which may result in a temporary discomfort for the passengers. To reach a stabilized cabin temperature again the system needs about 20 min : 10 min cabin temperature adjustment plus 10 min to compensated for furniture and lining heat dissipation. After a selection has been changed allow the cabin temperature to stabilize again before the selection is changed again.*

On ground, prior to flight:

1. The cabin temperature selector in the cockpit (AIR panel) should be set to about the 10 o'clock position (21.5 °C/70.7 °F) for ground and flight operation.
2. The zone correction should be set to zero by pressing the <<RESET TO COCKPIT SELECTED TEMP>> soft key on the cabin temperature page of the PIM.
   The above settings provide a good cabin temperature comfort for most operating conditions.

In flight:

1. The master temperature preselection on the cockpit panel should normally not be changed during flight.
   If a cockpit preselection change is required, the cabin crew should be informed since, in the cabin, there is no automatic indication associated.

   Note: *The PIM cabin temperature page will show the newly-selected cabin temperature (+ zone correction + altitude correction) in each of the cabin zones.*

2. If required, the cabin crew should normally adjust the zone temperature on the forward attendant panel, by no more than 0.5 °C (0.9 °F).

   Note: *1. Generally, the lowest comfortable temperature should be selected.*
   2. It is recommended that the cabin crew judge the required zone temperature, based on the temperature that is felt, rather than on the indicated value.

COCKPIT CREW - INDIVIDUAL HEATERS ◁

Ident.: DSC-21-10-30-00018249.0002001 / 21 MAR 16
Applicable to: ALL

The ambient temperature of the cockpit is regulated via the COCKPIT selector, located on the AIR panel.
To compensate for the sun's effect on cockpit temperature, two electrical heaters are installed : One on each side of the cockpit. These additional heaters are controlled via the HEATER selector or the applicable HEATER CAPT sw ◁ and HEATER F/O sw ◁ on the AIR panel. Each heater includes a protection against overheating.
The cockpit ambient temperature is selected on the AIR panel by the pilot who feels the hottest (the one in direct sunlight). The pilot who feels the coldest can increase the temperature on his side by selecting LO or HI on the HEATER selector or the applicable HEATER CAPT sw ◁ and HEATER F/O sw ◁ .

GENERAL

Ident.: DSC-21-10-40-00018250.0001001 / 21 MAR 16
Applicable to: ALL

Each Controller has a Channel 1 (that is normally in control), and a Channel 2 (that acts as a backup, if Channel 1 fails).

ZONE CONTROLLER

Ident.: DSC-21-10-40-00018252.0002001 / 21 MAR 16
Applicable to: ALL

CHANNEL 1 OR 2 FAILURE

A Channel 1 or 2 failure has no effect on zone temperature regulation.

CHANNELS 1 AND 2 FAILURE

Optimized and backup temperature regulation are lost. The packs deliver a fixed pack outlet temperature of 20 °C (68 °F). A Channel 1 and 2 failure removes all information from the COND SD page, which then displays “PACK REG”. Flow selection from the PACK FLOW selector is lost.

Note: *"PACK REG" indication on COND SD page is not applicable to A340-500/600 aircraft.*

PACK CONTROLLERS

Ident.: DSC-21-10-40-00018253.0004001 / 21 MAR 16
Applicable to: ALL

CHANNEL 1 OR 2 FAILURE

A Channel 1 or 2 failure has no effect on pack regulation.

CHANNELS 1 AND 2 FAILURE

The corresponding anti-ice valve regulates the pack outlet temperature between approximately 9 °C and 15 °C (respectively 48 °F and 59 °F). The ECAM signals, associated with the corresponding pack, are lost. The flow control valve pneumatically regulates the pack flow to approximately 120 % of the NORM flow.

AIR CYCLE MACHINE FAILURE

Ident.: DSC-21-10-40-00000812.0003001 / 31 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

If the Air Cycle Machine (ACM) fails (compressor/turbine seizure), the affected pack may be operated in the heat-exchanger cooling mode. Warm pre-conditioned bleed air enters the cooling path, via the pack flow control valve, and goes to the primary heat exchanger. Then, the compressor check valve opens, and air is cooled only by the heat exchanger. The ACM seizure reduces the pack flow.

As in normal pack operation :

- The pack controller regulates temperature, in accordance with zone controller demand, by modulating the temperature control valve and the ram air inlet and outlet flaps.
- The zone controller regulates the flow of hot air, through the trim air valves, to optimize cockpit/cabin temperature regulation. Hot air flow is lower than in normal pack operation, because the pack flow is reduced.

Note: *A pack with a seized ACM must be switched off on ground, due to the unavailability of RAM air cooling.*

AIR CYCLE MACHINE FAILURE

Ident.: DSC-21-10-40-00000812.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

If the Air Cycle Machine (ACM) fails (compressor/turbine seizure), the affected pack may be operated in the heat-exchanger cooling mode. Warm pre-conditioned bleed air enters the cooling path, via the pack flow control valve, and goes to the primary heat exchanger. Then, the compressor check valve and the bypass valve open, and air is cooled only by the heat exchanger. The ACM seizure reduces the pack flow.

As in normal pack operation :

- The pack controller regulates temperature, in accordance with zone controller demand, by modulating the temperature control valve and the ram air inlet and outlet flaps.
- The zone controller regulates the flow of hot air, through the trim air valves, to optimize cockpit/cabin temperature regulation. Hot air flow is lower than in normal pack operation, because the pack flow is reduced.

Note: *A pack with a seized ACM must be switched off on ground, due to the unavailability of RAM air cooling.*

HOT AIR VALVES FAILURE

Ident.: DSC-21-10-40-00000813.0001001 / 21 MAR 16
Applicable to: ALL

One or both valves failed open	:	No effect.
One valve failed closed	:	No effect (HOT AIR X valve opens)
Both valves failed closed	:	Optimized regulation is lost. Trim air valves are driven to full closed position. Packs only regulate the temperature.

TRIM AIR VALVE FAILURE

Ident.: DSC-21-10-40-00000814.0001001 / 21 MAR 16
Applicable to: ALL

Failed closed	:	Optimized temperature regulation of half of the corresponding zone is lost.
Failed open	:	Corresponding hot air valve closes. Optimized temperature regulation of half of each zone is lost.

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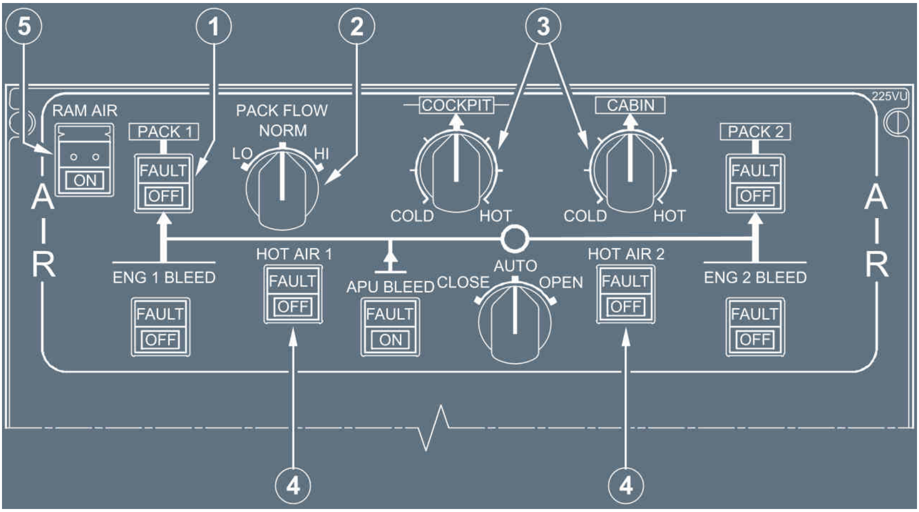
OVERHEAD PANEL

Ident.: DSC-21-10-50-00000815.0009001 / 11 JAN 17
Applicable to: LV-GKO, LV-GKP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RAM AIR
ON
PACK 1
FAULT
OFF
PACK FLOW
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HI
COCKPIT
CABIN
COLD
HOT
COLD
HOT
225VU
PACK 2
FAULT
OFF
A
I
R
A
I
R
ENG 1 BLEED
FAULT
OFF
HOT AIR 1
FAULT
OFF
APU BLEED
FAULT
ON
CLOSE
AUTO
OPEN
HOT AIR 2
FAULT
OFF
ENG 2 BLEED
FAULT
OFF
4
4

(1) PACK pb

On : The pack flow control valve is automatically controlled.

It opens except in the following cases:

- Upstream pressure below minimum
- Compressor outlet overheat
- Engine start sequence:
  1. One valve (or both, if the crossbleed valve is open) closes when:
     - The MODE selector is set to IGN, when on ground (valves reopen if MASTER switch or MAN START pushbutton are not set to ON within 30 s);
     - The MODE selector is set to IGN (or CRANK) and when on either engine:
       - The MASTER switch is set to ON (or MAN START pushbutton is set to ON) and,
       - The start valve is open and
       - N2 < 50 %.
  2. On ground, the valve reopening is delayed 1 min to avoid an extra pack closure cycle during subsequent engine start:
- Any door is not closed and locked, aircraft on ground and any engine running
- Fire pushbutton pressed for the engine on the related side
- Ditching is selected.

Note: *If there is no electrical power, the flow control valves remain open and permit NORM flow.*

OFF : The pack flow control valve closes provided it is electrically-supplied.

FAULT lt : The amber light and associated ECAM caution come on, when the pack flow control valve position disagrees with the selected position, or in the case of compressor outlet overheat or pack outlet overheat.

(2) PACK FLOW selector

Enables pack flow selection, depending on the number of passengers and ambient conditions (smoke removal, hot or wet conditions) : LO (80 %) - NORM (100 %) - HI (120 %). In case one bleed fails, the flow is limited to 80 %. Any selection is irrelevant in single pack operation, or with APU bleed supply. In these cases, a 125 % airflow is automatically selected.

Note: *The pack flow values given in percentage of the normal flow assume that the cargo cooling selector* ❄ *is on the OFF position or not installed.*

(3) Zone temperature selector

- 12 o'clock position: 24 °C (76 °F)
- COLD position: 18 °C (64 °F)
- HOT position: 30 °C (86 °F).

(4) HOT AIR 1 (or 2) pushbutton

On : The valve regulates hot air pressure.

OFF : The valve closes. The FAULT circuit is reset.

FAULT lt : The amber light and associated ECAM caution come on, when a duct overheat is detected (88 °C/190 °F). The valve, and the associated trim air valves close automatically. The FAULT light goes off, when the temperature drops below 70 °C (158 °F), and the flight crew selects OFF.

(5) RAM AIR pushbutton (guarded)

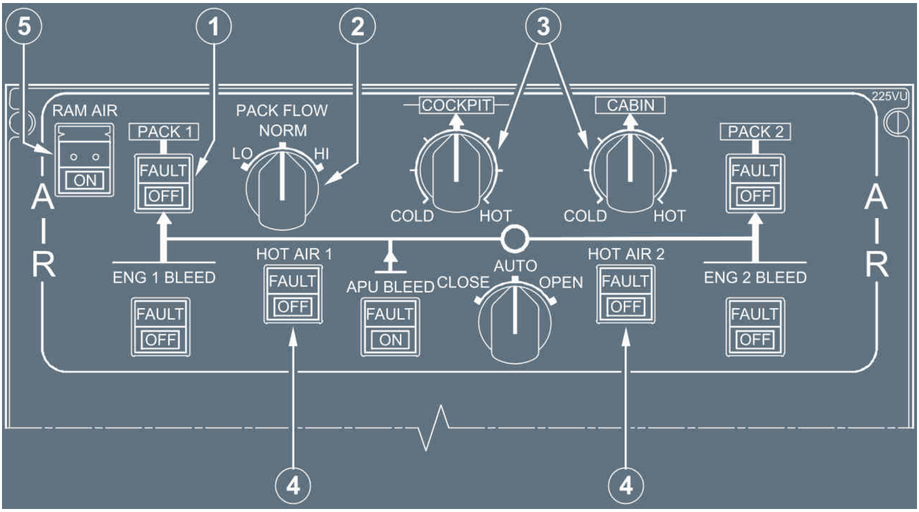
ON : The ON light comes on white.

If the DITCHING pb, on the CABIN PRESS panel, is in normal position:
- The emergency ram air inlet opens
- If $\Delta P < 1$ PSI: Each outflow valve opens to about 50 % when under automatic control. They do not automatically open when under manual control. The emergency ram air flow is directly supplied to the mixer unit
- If $\Delta P \geq 1$ PSI: Each outflow valve remains normally-controlled. No emergency ram air flows in.

Off : The emergency ram air inlet closes, and the outflow valves return to the normal position.

OVERHEAD PANEL

Ident.: DSC-21-10-50-00000815.0010001 / 11 JAN 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF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225VU
RAM AIR
ON
PACK 1
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PACK FLOW
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COLD
HOT
CABIN
COLD
HOT
PACK 2
FAULT
OFF
AIR
AIR
ENG 1 BLEED
FAULT
OFF
HOT AIR 1
FAULT
OFF
APU BLEED
FAULT
ON
AUTO
CLOSE
OPEN
HOT AIR 2
FAULT
OFF
ENG 2 BLEED
FAULT
OFF
④
④

(1) PACK pb

On : The pack flow control valve is automatically controlled.

It opens, except in the following cases:

- Upstream pressure below minimum
- Compressor outlet overheat
- Engine start sequence:
  1. One valve (or both, if the crossbleed valve is open) closes when:
     - The MODE selector is set to IGN, when on ground (valves reopen if MASTER switch or MAN START pushbutton are not set to ON within 30 s);
     - The MODE selector is set to IGN (or CRANK) and when (on either engine) :
       - The MASTER switch is set to ON (or MAN START pushbutton is set to ON) and,
       - The start valve is open and
       - N2 < 50 %.
  2. On ground, reopening of the valves is delayed 1 min to avoid an extra pack closure cycle during subsequent engine start:
- Any door is not closed and locked, aircraft on ground, and any engine running
- Fire pushbutton pressed for the engine on the related side
- Ditching is selected.

Note: *If there is no electrical power, the flow valves remain open and permit NORM flow.*

OFF : The pack flow control valve closes, provided it is electrically-supplied.

FAULT lt : The amber light and associated ECAM caution come on, when the pack flow control valve position disagrees with the selected position, or in the case of compressor outlet overheat or pack outlet overheat.

(2) PACK FLOW selector

Enables pack flow selection, depending on the number of passengers and ambient conditions (smoke removal, hot or wet conditions). LO (80 %) – NORM (100 %) – HI (120 %). In case one bleed fails, the flow is limited to 80 %. Any selection is irrelevant in single pack operation, or with APU bleed supply. In these cases, a 125 % airflow is automatically selected.

Note: *The pack flow values given in percentage of the normal flow assume that the cargo cooling selector ◁ is on the OFF position or not installed.*

(3) Zone temperature selector

- 12 o'clock position: 24 °C (76 °F)
- COLD position: 18 °C (64 °F)
- HOT position: 30 °C (86 °F).

(4) HOT AIR 1 (or 2) pushbutton

On : The valve regulates hot air pressure.

OFF : The valve closes. The FAULT circuit is reset.
Forward cargo heating is lost, if HOT AIR 1 is affected.

FAULT lt : The amber light and associated ECAM caution come on, when a duct overheat is detected (88 °C/190 °F). The valve, and the associated trim air valves close automatically. The FAULT light goes off, when the temperature drops below 70 °C (158 °F), and the flight crew selects OFF.

(5) RAM AIR pushbutton (guarded)

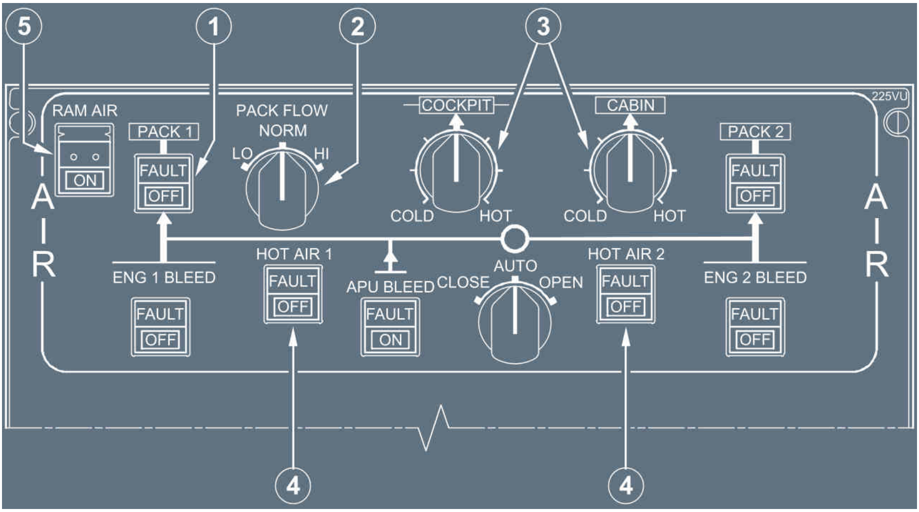
ON : The ON light comes on white.

If the DITCHING pb, on the CABIN PRESS panel, is in the normal position:
- The emergency ram air inlet opens
- If $\Delta P < 1$ PSI: Each outflow valve opens to about 50 % when under automatic control. They do not automatically open when under manual control. The emergency ram air flow is directly supplied to the mixer unit
- If $\Delta P \geq 1$ PSI: Each outflow valve remains normally-controlled. No emergency ram air flows in.

Off : The emergency ram air inlet closes, and the outflow valves return to the normal position.

OVERHEAD PANEL

Ident.: DSC-21-10-50-00000815.0012001 / 11 JAN 17
Applicable to: LV-KHT, LV-KHU


5
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225VU
RAM AIR
ON
PACK 1
FAULT
OFF
PACK FLOW
NORM
LO
HI
COCKPIT
CABIN
COLD
HOT
COLD
HOT
PACK 2
FAULT
OFF
AIR
AIR
ENG 1 BLEED
FAULT
OFF
HOT AIR 1
FAULT
OFF
APU BLEED
FAULT
ON
CLOSE
AUTO
OPEN
HOT AIR 2
FAULT
OFF
ENG 2 BLEED
FAULT
OFF
4
4

(1) PACK pb

On : The pack flow control valve is automatically controlled.

It opens, except in the following cases:

- Upstream pressure below minimum
- Compressor outlet overheat
- Engine start sequence:
  1. One valve (or both, if the crossbleed valve is open) closes when:
     - The MODE selector is set to IGN, when on ground (valves reopen if MASTER switch or MAN START pushbutton are not set to ON within 30 s) :
     - The MODE selector is set to IGN (or CRANK) and when (on either engine) :
       - The MASTER switch is set to ON (or MAN START pushbutton is set to ON) and,
       - The start valve is open and
       - N3 < 50 %.
  2. On ground, reopening of the valves is delayed 1 min to avoid a supplementary pack closure cycle during subsequent engine start:
- Any door is not closed and locked, aircraft on ground, and any engine running
- Fire pushbutton pressed for the engine on the related side
- Ditching is selected.

Note: If there is no electrical power, the flow valves remain open and permit NORM flow.

OFF : The pack flow control valve closes, provided it is electrically-supplied.

FAULT lt : The amber light and associated ECAM caution come on, when the pack flow control valve position disagrees with the selected position, or in the case of compressor outlet overheat or pack outlet overheat.

(2) PACK FLOW selector

Enables pack flow selection, depending on the number of passengers and ambient conditions (smoke removal, hot or wet conditions). LO (80 %) – NORM (100 %) – HI (120 %). In case one bleed fails, the flow is limited to 80 %. Any selection is irrelevant in single pack operation, or with APU bleed supply. In these cases, a 125 % airflow is automatically selected.

Note: The pack flow values given in percentage of the normal flow assume that the cargo cooling selector ◁ is on the OFF position or not installed.

(3) Zone temperature selector

- 12 o'clock position: 24 °C (76 °F)
- COLD position: 18 °C (64 °F)
- HOT position: 30 °C (86 °F).

(4) HOT AIR 1 (or 2) pushbutton

On : The valve regulates hot air pressure.

OFF : The valve closes. The FAULT circuit is reset.
Forward cargo heating is lost, if HOT AIR 1 is affected.

FAULT lt : The amber light and associated ECAM caution come on, when a duct overheat is detected (88 °C/190 °F). The valve, and the associated trim air valves close automatically. The FAULT light goes off, when the temperature drops below 70 °C (158 °F), and the flight crew selects OFF.

(5) RAM AIR pushbutton (guarded)

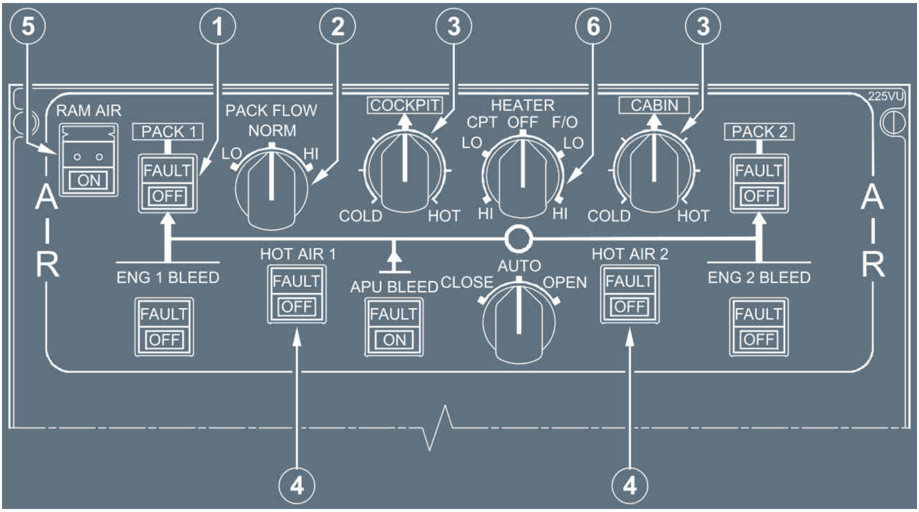
ON : The ON light comes on white.

If the DITCHING pb, on the CABIN PRESS panel, is in the normal position:
- The emergency ram air inlet opens
- If $\Delta P < 1$ PSI: Each outflow valve opens to about 50 % when under automatic control. They do not automatically open when under manual control. The emergency ram air flow is directly supplied to the mixer unit
- If $\Delta P \geq 1$ PSI: Each outflow valve remains normally-controlled. No emergency ram air flows in.

Off : The emergency ram air inlet closes, and the outflow valves return to the normal position.

OVERHEAD PANEL

Ident.: DSC-21-10-50-00000815.0018001 / 11 JAN 17
Applicable to: LV-KAN, LV-KAO


5
1
2
3
6
3
225VU
RAM AIR
ON
PACK 1
FAULT
OFF
PACK FLOW
NORM
LO
HI
COCKPIT
COLD
HOT
HEATER
CPT
OFF
F/O
LO
LO
HI
HI
CABIN
COLD
HOT
PACK 2
FAULT
OFF
AIR
AIR
ENG 1 BLEED
FAULT
OFF
HOT AIR 1
FAULT
OFF
APU BLEED
FAULT
ON
CLOSE
AUTO
OPEN
HOT AIR 2
FAULT
OFF
ENG 2 BLEED
FAULT
OFF
4
4

(1) PACK pb

On : The pack flow control valve is automatically controlled.

It opens, except in the following cases:

- Upstream pressure below minimum
- Compressor outlet overheat
- Engine start sequence:
  1. One valve (or both, if the crossbleed valve is open) closes when:
     - The MODE selector is set to IGN, when on ground (valves reopen if MASTER switch or MAN START pushbutton are not set to ON within 30 s);
     - The MODE selector is set to IGN (or CRANK) and when (on either engine) :
       - The MASTER switch is set to ON (or MAN START pushbutton is set to ON) and,
       - The start valve is open and
       - N2 < 50 %.
  2. On ground, reopening of the valves is delayed 1 min to avoid an extra pack closure cycle during subsequent engine start:
- Any door is not closed and locked, aircraft on ground, and any engine running
- Fire pushbutton pressed for the engine on the related side
- Ditching is selected.

Note: *If there is no electrical power, the flow valves remain open and permit NORM flow.*

OFF : The pack flow control valve closes, provided it is electrically-supplied.

FAULT lt : The amber light and associated ECAM caution come on, when the pack flow control valve position disagrees with the selected position, or in the case of compressor outlet overheat or pack outlet overheat.

(2) PACK FLOW selector

Enables pack flow selection, depending on the number of passengers and ambient conditions (smoke removal, hot or wet conditions). LO (80 %) – NORM (100 %) – HI (120 %). In case one bleed fails, the flow is limited to 80 %. Any selection is irrelevant in single pack operation, or with APU bleed supply. In these cases, a 125 % airflow is automatically selected.

Note: *The pack flow values given in percentage of the normal flow assume that the cargo cooling selector* ◁ *is on the OFF position or not installed.*

(3) Zone temperature selector

- 12 o'clock position: 24 °C (76 °F)
- COLD position: 18 °C (64 °F)
- HOT position: 30 °C (86 °F).

(4) HOT AIR 1 (or 2) pushbutton

On : The valve regulates hot air pressure.

OFF : The valve closes. The FAULT circuit is reset.
Forward cargo heating is lost, if HOT AIR 1 is affected.

FAULT lt : The amber light and associated ECAM caution come on, when a duct overheat is detected (88 °C/190 °F). The valve, and the associated trim air valves close automatically. The FAULT light goes off, when the temperature drops below 70 °C (158 °F), and the flight crew selects OFF.

(5) RAM AIR pushbutton (guarded)

ON : The ON light comes on white.

If the DITCHING pb, on the CABIN PRESS panel, is in the normal position:
- The emergency ram air inlet opens
- If $\Delta P < 1$ PSI: Each outflow valve opens to about 50 % when under automatic control. They do not automatically open when under manual control. The emergency ram air flow is directly supplied to the mixer unit
- If $\Delta P \geq 1$ PSI: Each outflow valve remains normally-controlled. No emergency ram air flows in.

Off : The emergency ram air inlet closes, and the outflow valves return to the normal position.

(6) HEATER selector

OFF: Both heaters are OFF. Blow air temperature is provided according to the COCKPIT selector position.

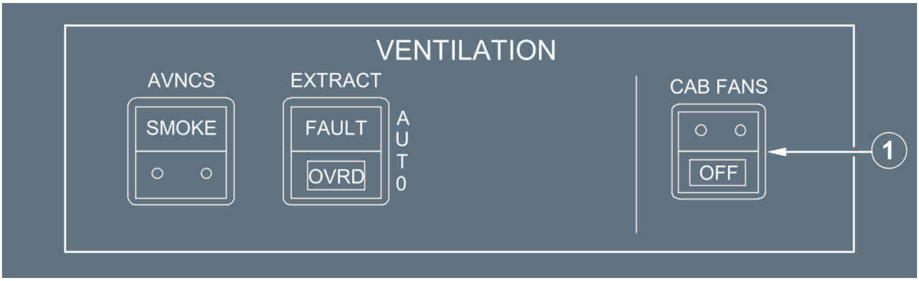
LO : Blow air temperature increases by 12.5 °C(22.5 °F).

HI : Blow air temperature increases by 25 °C(45 °F).

Note: Only one heater operates at a time: Either on the Captain (L) or F/O (R) side.

OVERHEAD PANEL (CONT'D)

Ident.: DSC-21-10-50-00000816.0003001 / 22 MAY 12
Applicable to: ALL



(1) CAB FANS pb

On : The two cabin fans run. The air from the cabin is blown to the avionics compartment and also to the mixer unit of the conditioning systems.

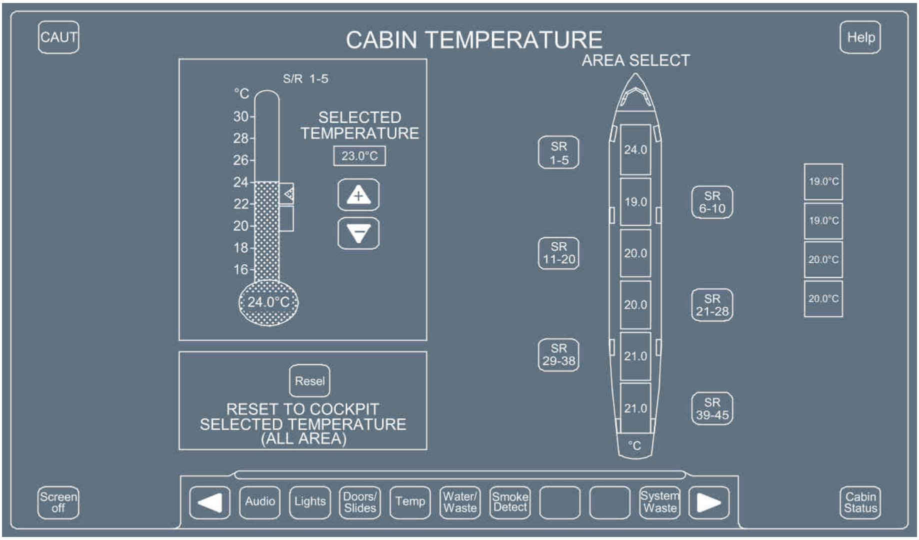
OFF : The two cabin fans stop.

Note: If a fan failure occurs, the ECAM caution is displayed.

FWD ATTENDANT PANEL

Ident.: DSC-21-10-50-00000817.0004001 / 22 MAY 12
Applicable to: ALL

Allows fine-tuning of individual zone temperature (± 3 °C/± 5.4 °F).


CAUT
CABIN TEMPERATURE
Help
AREA SELECT
S/R 1-5
°C
30
28
26
24
22
20
18
16
24.0°C
SELECTED TEMPERATURE
23.0°C
Resel
RESET TO COCKPIT SELECTED TEMPERATURE (ALL AREA)
SR 1-5
SR 11-20
SR 29-38
24.0
19.0
20.0
20.0
21.0
21.0
°C
SR 6-10
SR 21-28
SR 39-45
19.0°C
19.0°C
20.0°C
20.0°C
Screen off
Audio
Lights
Doors/ Slides
Temp
Water/ Waste
Smoke Detect
System Waste
Cabin Status

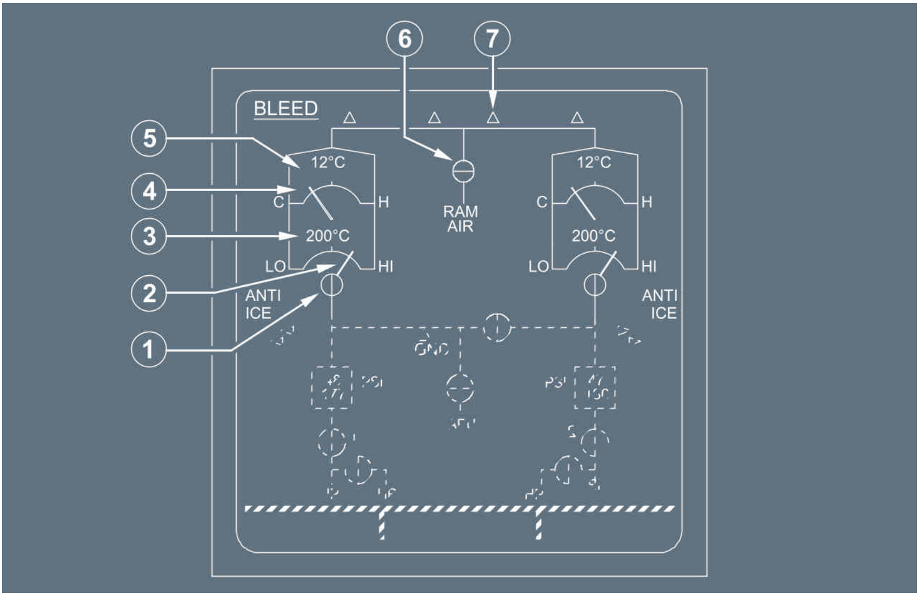
ADDITIONAL ATTENDANT PANEL

Ident.: DSC-21-10-50-00000818.0002001 / 21 MAR 16
Applicable to: ALL

Additional attendant panels can be installed in different locations.
The temperature setting of the related zone can be changed (± 3 °C/± 5.4 °F).

ECAM BLEED PAGE

Ident.: DSC-21-10-50-00000819.0005001 / 31 AUG 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



(1) Pack flow control valve

Inline - Green	:	The valve is open.
Crossline - Amber	:	The valve is closed.

(2) Pack flow indication
The needle position (green) represents the actual flow rate. The 12 o'clock position corresponds to a 100 % airflow

LO : 80 % airflow

HI : 120 % airflow

(3) Pack compressor outlet temperature indication
It normally appears in green.
But' it appears in amber, if the temperature is higher than 260 °C.
It remains amber, as long as the temperature is not lower than 180 °.

(4) Temperature control valve position indication

It appears in green.

C : The valve is closed.

H : The valve is fully open.

(5) Pack outlet temperature indication

It normally appears in green.

But, it appears in amber, if the temperature is higher than 95 °C. It remains amber as long as the temperature is not lower than 60 °C.

(6) EMERGENCY RAM AIR inlet indication

Crossline - Green	The flap is normally closed.
In Transit - Amber	The flap is partially open.
Inline - Amber	If open on ground, or if the flap position disagrees with the position of the RAM AIR pushbutton (OFF).
Inline - Green	The flap is fully open.
Crossline - Amber	The flap is closed, and the RAM AIR pushbutton is in the ON position.

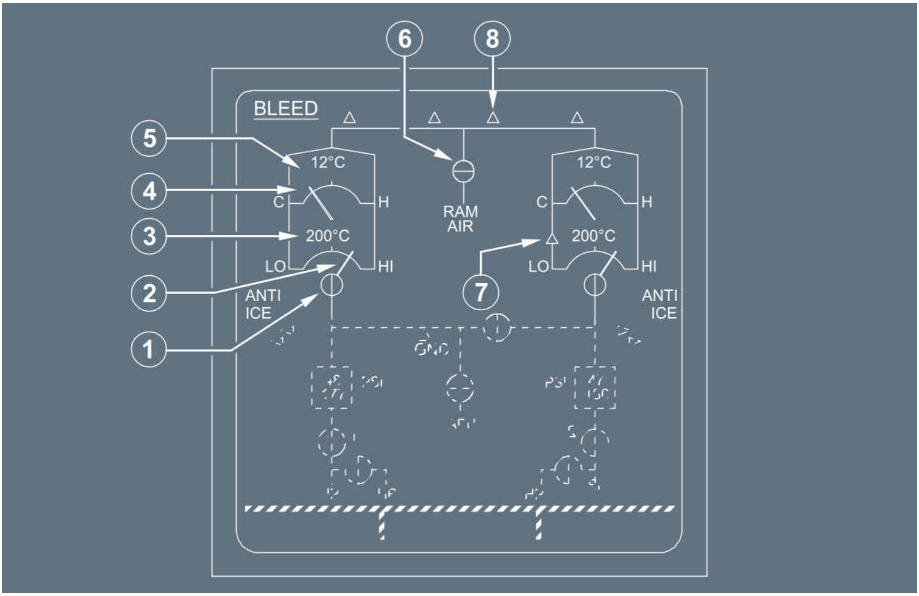
(7) Bleed users' indication

It normally appears in green.

But, it appears in amber, when the RAM AIR flap and the two packs are fully closed.

ECAM BLEED PAGE

Ident.: DSC-21-10-50-00000819.0003001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP



(1) Pack flow control valve

Inline - Green	:	The valve is open.
Crossline - Amber	:	The valve is closed.

(2) Pack flow indication

The needle position (green) represents the actual flow rate. The 12 o'clock position corresponds to a 100 % airflow

LO : 80 % airflow

HI : 120 % airflow

(3) Pack compressor outlet temperature indication

It normally appears in green.
But' it appears in amber, if the temperature is higher than 260 °C.
It remains amber, as long as the temperature is not lower than 180 °.

(4) Temperature control valve position indication

It appears in green.

C : The valve is closed.

H : The valve is fully open.

(5) Pack outlet temperature indication

It normally appears in green.
But, it appears in amber, if the temperature is higher than 95 °C. It remains amber as long as the temperature is not lower than 60 °C.

(6) EMERGENCY RAM AIR inlet indication

Crossline - Green	The flap is normally closed.
In Transit - Amber	The flap is partially open.
Inline - Amber	If open on ground, or if the flap position disagrees with the position of the RAM AIR pushbutton (OFF).
Inline - Green	The flap is fully open.
Crossline - Amber	The flap is closed, and the RAM AIR pushbutton is in the ON position.

(7) Bypass valve indication

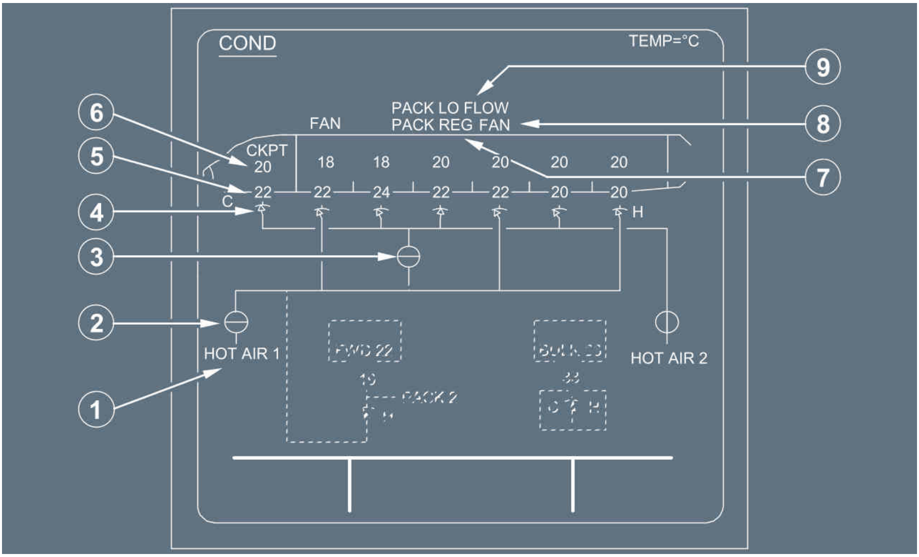
Triangle - Green	The bypass valve is normally open.
No Display	The bypass valve is fully closed.

(8) Bleed users' indication

It normally appears in green.
But, it appears in amber, when the RAM AIR flap and the two packs are fully closed.

ECAM COND PAGE

Ident.: DSC-21-10-50-00000820.0004001 / 16 MAY 17
Applicable to: ALL


COND
TEMP=°C
FAN
PACK LO FLOW
PACK REG FAN
CKPT
20
18
18
20
20
20
20
22
22
24
22
22
20
20
C
H
HOT AIR 1
HOT AIR 2
FWD 22
19
PACK 2
H
BULK 23
33
C
H
1
2
3
4
5
6
7
8
9

(1) HOT AIR indication
Normally green.
Becomes amber if the flow control valve is fully closed.

(2) Hot air valve indication

In line green : normally open (not fully closed).

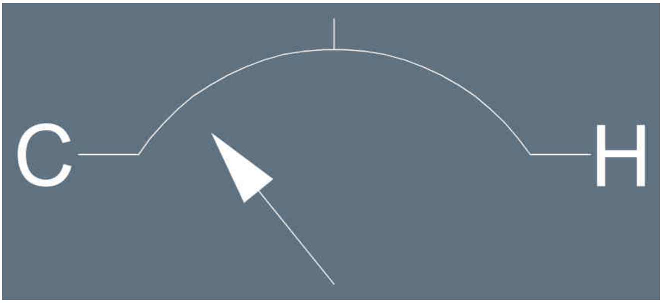
Crossline green : normally closed (fully closed).

Crossline amber :
- Valve is abnormally closed, or
- Flow Control Valve 1(2) is closed, or
- The respective HOT AIR pb is OFF, or
- There is a duct overheat for the related Trim Air Valve.

In line amber : not fully closed and controlled closed.

(3) Hot air x valve indication
Identical to the HOT AIR valve indication

(4) Trim air valve position indication



The arrow is normally green. It is replaced by amber crosses (“XX”) if the valve fails.

C : The valve is fully closed.

H : The valve is fully open.

Note: The number of trim air valves vary, depending on the cabin configuration.

(5) Zone duct temperature indication
It is normally in green.
It becomes amber above 88 °C.
It remains amber, until the temperature is below 70 °C.

(6) Zone temperature indication
It is in green.

Note: The temperature of the cockpit and of the cabin zones 1, 3 and 5 are also displayed on the ECAM CRUISE page.

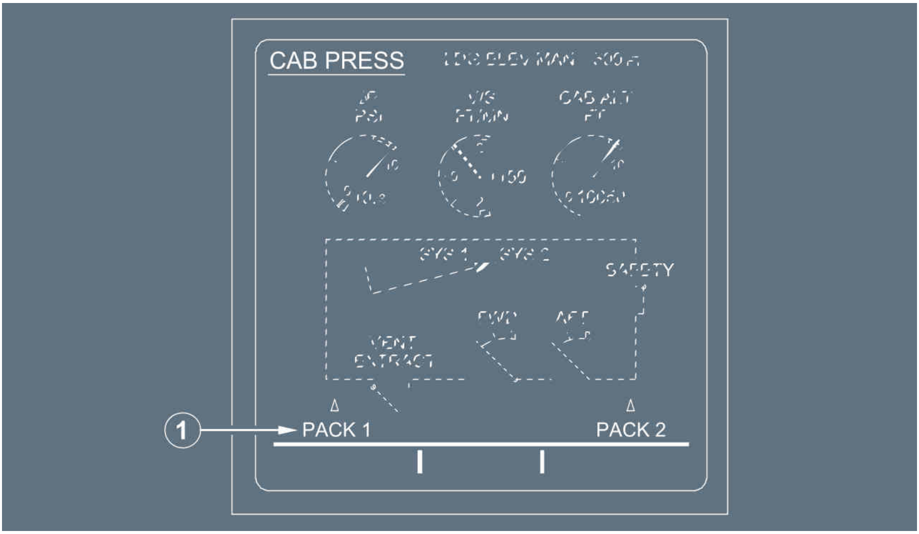
(7) PACK REG indication
It is in green when, the zone controller is inoperative (both channels fail).
Temperature is regulated by the packs only.

(8) FAN indication
It is in amber, if the fan fails, or if it is selected OFF, via the CAB FANS pb.

(9) PACK LO FLOW indication
It pulses in green, when the flow is insufficient to reach the selected temperature.
This indicates that the zone controller requests an increase in flow.

ECAM CAB PRESS PAGE

Ident.: DSC-21-10-50-00000821.0001001 / 22 MAY 12
Applicable to: ALL


CAB PRESS
LDG ELEV MAN
ΔP
PSI
V/S
FT/MIN
CAB ALT
FT
SYS 1
SYS 2
SAFETY
FWD
AFT
VENT
EXTRACT
1
Δ
PACK 1
Δ
PACK 2

(1) PACK indication

pack flow control valve open :

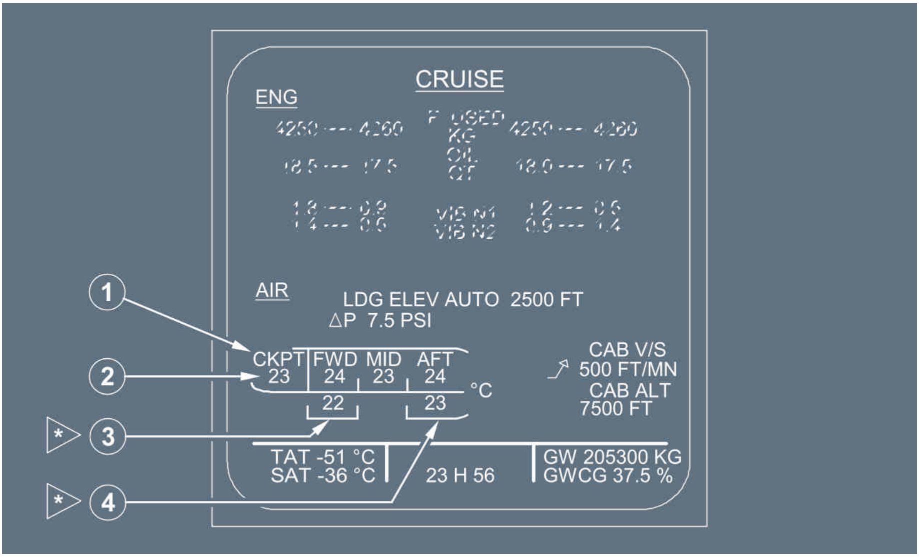
Δ	Green
PACK 1	White

pack flow control valve closed :

Δ	Amber
PACK 1	Amber

ECAM CRUISE PAGE

Ident.: DSC-21-10-50-00018215.0011001 / 21 MAR 16
Applicable to: ALL


CRUISE
ENG
4250 --- 4260
F USED
KG
4250 --- 4260
18.5 --- 17.5
OIL
QT
18.0 --- 17.5
1.8 --- 0.9
1.4 --- 0.6
VIB N1
VIB N2
1.2 --- 0.6
0.9 --- 1.4
AIR
LDG ELEV AUTO 2500 FT
ΔP 7.5 PSI
CKPT
23
FWD
24
MID
23
AFT
24
°C
22
23
CAB V/S
500 FT/MN
CAB ALT
7500 FT
TAT -51 °C
SAT -36 °C
23 H 56
GW 205300 KG
GWCG 37.5 %
1
2
*
3
*
4

(1) Zone indication

(2) Cockpit and cabin zones air temperature
Temperatures of zones 1, 3 and 5 of the cabin are displayed.

(3) Forward cargo compartment temperature ◁*

(4) Bulk cargo compartment temperature ◁*

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-21-10-50-A-00017067.0001001 / 21 MAR 16

PACK FLOW HI :	This memo appears in green, when the PACK FLOW selector is in the HI position.

Ident.: DSC-21-10-50-A-00017065.0001001 / 21 MAR 16

PACK FLOW LO :	This memo appears in green, when the PACK FLOW selector is in the LO position.

Ident.: DSC-21-10-50-A-00017064.0001001 / 21 MAR 16

RAM AIR	:	This memo appears in green, if the RAM AIR pb-sw is ON. This memo becomes amber in flight phases 1 and 2.

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GENERAL

Ident.: DSC-21-20-10-00018216.0007001 / 21 MAR 16
Applicable to: ALL

In normal operation, pressurization control is fully automatic.

The system consists of :
- Two Cabin Pressure Controllers (CPC)
- One Residual Pressure Control Unit (RPCU) ◁
- Two outflow valves, with actuators that incorporate three motors (two for automatic operation, one for manual operation)
- One control panel
- Three safety valves
- One negative relief valve

Any one of the three independent electric motors can power the outflow valves.
Normally, one of the two cabin pressure controllers operates the outflow valves by means of its associated automatic motor. In case of ditching, an override switch on the control panel allows the flight crew to close the outflow valves, and all valves below the flotation line.

AUTOMATIC OPERATION

Ident.: DSC-21-20-10-00000792.0002001 / 21 NOV 11
Applicable to: ALL

The system can be fully or semi-automatic.
In fully-automatic operation :
Cabin pressurization is achieved from internal or external schedules, when appropriate FMGES inputs are available.
In automatic operation, a ΔP limiting function monitors differential pressure.
When FMGES data are not available, the crew needs to select the landing field elevation. The pressurization system then uses the manually-selected landing field elevation for internal schedules.

Note: *In semi-automatic operation, one outflow valve is controlled automatically and the other is controlled manually.*

MANUAL OPERATION

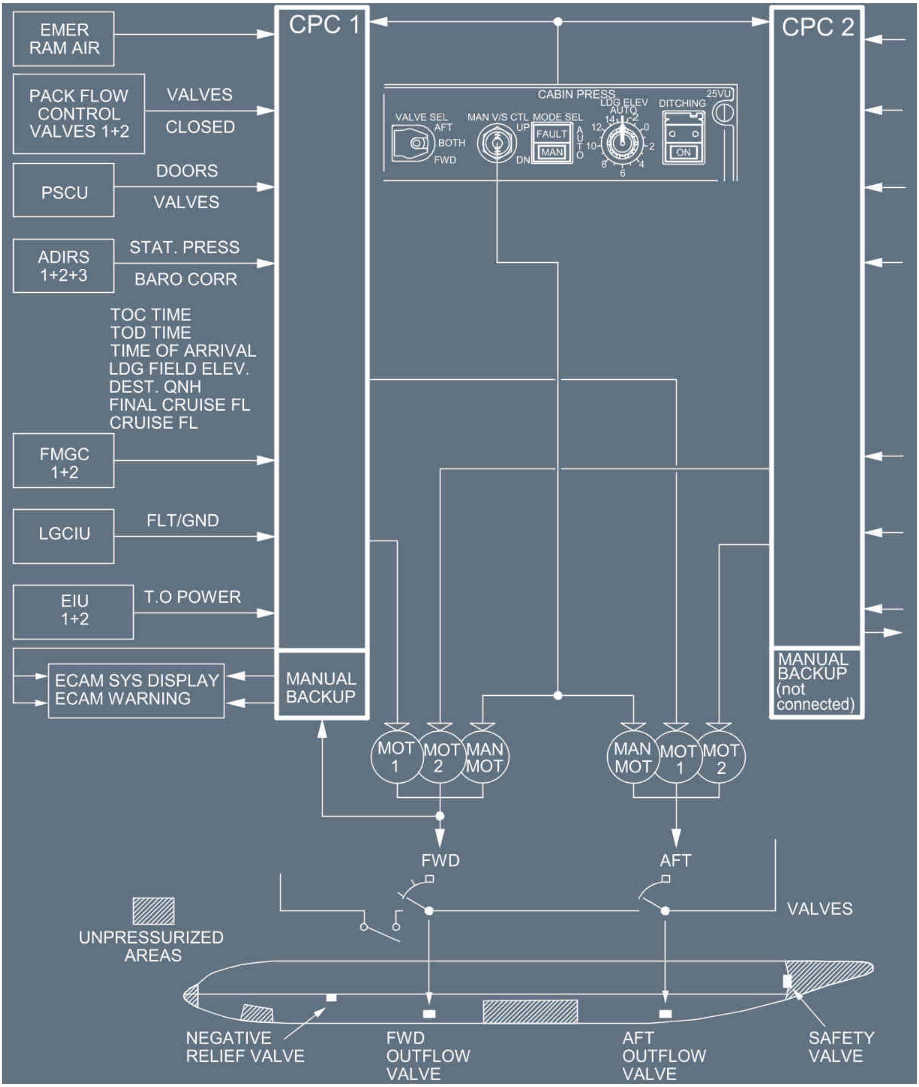
Ident.: DSC-21-20-10-00000793.0001001 / 21 MAR 16
Applicable to: ALL

In manual mode, the flight crew controls the cabin altitude via the manual motor of the outflow valves, by operating controls on the pressurization control panel.
Manual operation has priority over all other modes.

SCHEMATICS

Ident.: DSC-21-20-10-00000794.0003001 / 21 NOV 11

Applicable to: ALL


EMER
RAM AIR
PACK FLOW
CONTROL
VALVES 1+2
VALVES
CLOSED
PSCU
DOORS
VALVES
ADIRS
1+2+3
STAT. PRESS
BARO CORR
TOC TIME
TOD TIME
TIME OF ARRIVAL
LDG FIELD ELEV.
DEST. QNH
FINAL CRUISE FL
CRUISE FL
FMGC
1+2
LGCIU
FLT/GND
EIU
1+2
T.O POWER
ECAM SYS DISPLAY
ECAM WARNING
CPC 1
MANUAL
BACKUP
CPC 2
MANUAL
BACKUP
(not
connected)
CABIN PRESS
25VU
VALVE SEL
AFT
BOTH
FWD
MAN V/S CTL
UP
DN
MODE SEL
FAULT
MAN
AUTO
LDG ELEV
AUTO
14
12
10
8
6
4
2
0
DITCHING
ON
MOT
1
MOT
2
MAN
MOT
MAN
MOT
MOT
1
MOT
2
FWD
AFT
VALVES
UNPRESSURIZED
AREAS
NEGATIVE
RELIEF VALVE
FWD
OUTFLOW
VALVE
AFT
OUTFLOW
VALVE
SAFETY
VALVE

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CABIN PRESSURE CONTROLLERS

Ident.: DSC-21-20-20-00000795.0002001 / 15 FEB 11
Applicable to: ALL

Two identical, independent, automatic controllers are used for cabin pressure control. They receive signals from the Air Data Inertial Reference System (ADIRS), the Flight Management Guidance and Envelope Computer (FMGEC), the Engine Interface Unit (EIU), the Landing Gear Control Interface Unit (LGCIU), the Proximity Switch Control Unit (PSCU) and the pack flow control valves. They perform the automatic cabin pressure control. They generate signals for the ECAM. In automatic mode, one controller is active, the other is on standby.
For operation in manual mode, each controller has a backup section, which is powered by an independent power supply in the controller N° 1 position. This section also has a pressure sensor that generates the cabin altitude and pressure signal for the ECAM, when MAN mode is selected.
The controllers communicate with each other via a cross-channel link.

OUTFLOW VALVES

Ident.: DSC-21-20-20-00000796.0002001 / 21 MAR 16
Applicable to: ALL

Two outflow valves are located below the flotation line. Each outflow valve assembly consists of a flush, skin-mounted, rectangular frame, carrying inward and outward opening flaps linked to the actuator. The actuator contains the drives of two electric motors, and the drive of a third electric motor. Either of two electric motors operates the valve in automatic mode, and a third electric motor operates it in manual mode. To allow an easy and smooth control of the cabin's vertical speed in manual mode, the outflow valves move at a slower speed than in automatic mode.
In automatic mode, the operating controller signals the position of the valve to the ECAM.
In manual mode, the backup section of the N° 1 controller signals the position of the valve to the ECAM.
The outflow valves automatically close, if the cabin altitude reaches 15 000 ft, provided that the valves are in automatic mode.
When one pack is OFF and ΔP is above 4 PSI, the aft outflow valve closes and the forward outflow valve controls the cabin pressure.

Note: *When the RAM AIR pushbutton is ON, and ΔP is below 1 PSI, the system drives the outflow valves about 50 % open if it is under automatic control. If the system is under manual control, the outflow valves do not automatically open, even if ΔP is below 1 PSI.*

SAFETY VALVES

Ident.: DSC-21-20-20-00000797.0002001 / 21 MAR 16
Applicable to: ALL

Three independent pneumatic safety valves prevent the cabin pressure from going too high (8.85 PSI above external ambient pressure) or too low (0.73 PSI below external ambient pressure). They are on the rear pressure bulkhead, above the flotation line.

NEGATIVE RELIEF VALVE

Ident.: DSC-21-20-20-00018212.0001001 / 21 MAR 16
Applicable to: ALL

The negative relief valve is installed below the floor level, aft of left door n° 1, above the floatation line.
It assists the safety valves in preventing the cabin pressure from going too low.

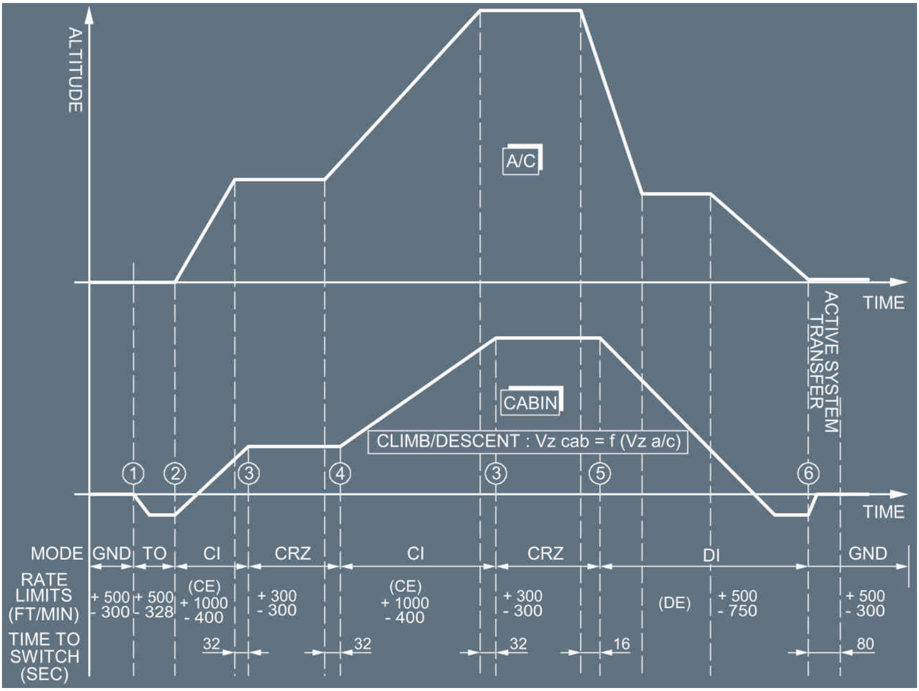
RESIDUAL PRESSURE CONTROL UNIT (RPCU)

Ident.: DSC-21-20-20-00018211.0001001 / 04 DEC 18
Applicable to: ALL

The Residual Pressure Control Unit (RPCU) automatically depressurizes the aircraft in case of abnormal residual pressure on ground. The RPCU may automatically open the forward, and respectively aft, outflow valves, when:
- The forward, and respectively aft, outflow valves are not fully open, and
- Both Cabin Pressure Controllers (CPC) are failed, or manual mode is selected, and
- The aircraft is on ground, and
- All engines are shutdown, or all ADIRS indicate an airspeed below 100 kt.

PRESSURIZATION FLIGHT PROFILE

Ident.: DSC-21-20-20-00003943.0001001 / 22 MAY 12
Applicable to: ALL


ALTITUDE
A/C
TIME
ACTIVE SYSTEM TRANSFER
CABIN
CLIMB/DESCENT : Vz cab = f (Vz a/c)
①
②
③
④
③
⑤
⑥
TIME
MODE
GND
TO
CI
CRZ
CI
CRZ
DI
GND
RATE LIMITS (FT/MIN)
+ 500 - 300
+ 500 - 328
(CE) + 1000 - 400
+ 300 - 300
(CE) + 1000 - 400
+ 300 - 300
(DE)
+ 500 - 750
+ 500 - 300
TIME TO SWITCH (SEC)
32
32
32
16
80

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AUTOMATIC PRESSURE CONTROL MODE

Ident.: DSC-21-20-30-00000801.0003001 / 21 NOV 11
Applicable to: LV-GKO, LV-GKP

- Two identical, independent, automatic systems (each consisting of a controller and its associated motors) control cabin pressure.
  Either system controls the two outflow valves.
  Only one controller operates at a time.

  An automatic transfer occurs:
  - 80 s after each landing.
  - If the operating system fails.
- The controller normally uses the landing elevation and the QNH from the FMGEC, and the pressure altitude from the ADIRS.
  If FMGEC data are unavailable, the controller uses the Captain BARO Reference from the ADIRS and the LDG ELEV selection.
- Pressurization is assumed through the following modes:

GROUND (GND)

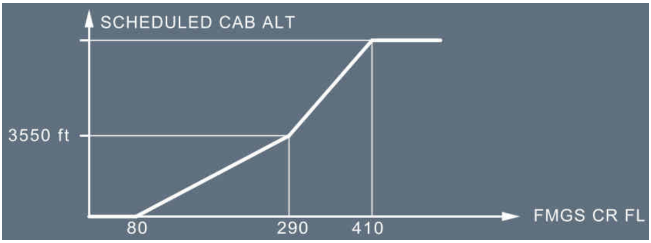
Before takeoff, and 80 s after landing, the system keeps the outflow valves fully open to ensure there is no residual pressure differential inside the aircraft.
At touchdown, to release the remaining cabin overpressure, a depressurization sequence controls the cabin V/S at +500 ft/min.

TAKEOFF (TO)

To avoid a pressure surge at rotation, the controller prepressurizes the aircraft at a rate of -328 ft/min until the pressure differential reaches 0.1 PSI. At lift off, the controller initiates the climb phase.

CLIMB IN INTERNAL MODE (CI)

CAB V/S varies, according to a preprogrammed law, in order to reach the scheduled CAB ALT at the top of climb defined by the FMGES cruise FL.
The CAB V/S is limited to 1 000 ft/min.



The LDG ELEV selector has no effect in climb.
If the FMGES CR FL is not available, the CPCS uses the FL 410 default value.

CLIMB IN EXTERNAL MODE (CE)

CAB ALT varies according to FMGES estimated times and planned cruise FL.
The cabin climb rate is limited to 1 000 ft/min.

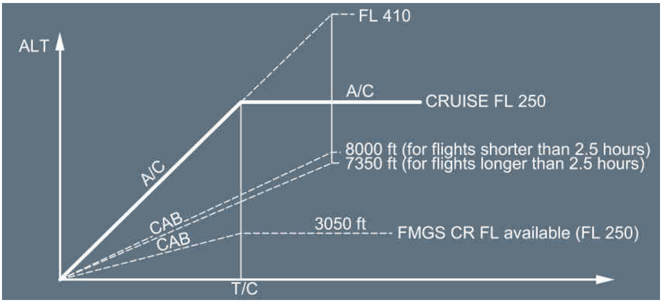
CRUISE (CRZ)

As long as the aircraft remains in level flight, the CPC maintains the cabin altitude at the value reached at top of climb.

The cabin altitude cannot exceed:
- 7 350 ft for flights longer than 2.5 h, or
- 8 000 ft for flights shorter than 2.5 h.

However, if the flight crew sets (manually or in the FMGES) a LDG ELEV higher than the current cabin altitude, the cabin altitude cannot exceed 8 000 ft.

Note: If the takeoff runway is higher than 8 000 ft, the cabin altitude during climb is controlled to 8 000 ft.



DESCENT IN INTERNAL MODE (DI)

Pressure rate is optimized so that cabin pressure reaches landing field pressure +0.1 PSI just prior to landing. The cabin descent rate is limited to 750 ft/min.

DESCENT IN EXTERNAL MODE (DE)

CAB altitude varies according to FMGES-estimated times, and cabin pressure reaches landing field pressure +0.1 PSI just prior to landing.
The cabin descent rate is limited to 750 ft/min.

ABORT (AB)

The abort mode prevents the cabin altitude from climbing, if the aircraft does not climb after takeoff.
Cabin pressure is set back to the takeoff altitude +0.1 PSI.

GROUND (AFTER LANDING) (GND)

At touchdown, to release the remaining ∆P a depressurized sequence controls the cabin vertical speed at +500 ft/min.
80 s after landing the outflow valves are controlled fully open to ensure there is no residual ∆P in the aircraft.

AUTOMATIC PRESSURE CONTROL MODE

Ident.: DSC-21-20-30-00000801.0010001 / 21 NOV 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

- Two identical, independent, automatic systems (each consisting of a controller and its associated motors) control cabin pressure.
  Either system controls the two outflow valves.
  Only one controller operates at a time.

  An automatic transfer occurs:
  - 80 s after each landing.
  - If the operating system fails.
- The controller normally uses the landing elevation and the QNH from the FMGEC, and the pressure altitude from the ADIRS.
  If FMGEC data are unavailable, the controller uses the Captain BARO Reference from the ADIRS and the LDG ELEV selection.
- Pressurization is assumed through the following modes:

GROUND (GND)

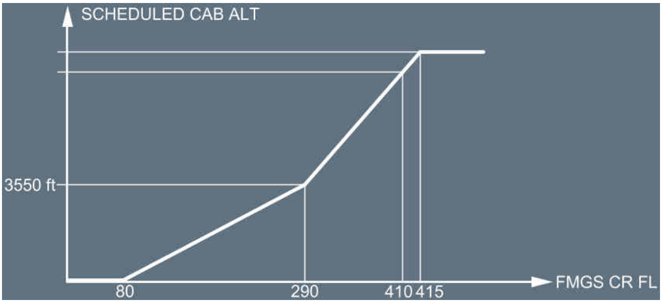
Before takeoff, and 80 s after landing, the system keeps the outflow valves fully open to ensure there is no residual pressure differential inside the aircraft.
At touchdown, to release the remaining cabin overpressure, a depressurization sequence controls the cabin V/S at +500 ft/min.

TAKEOFF (TO)

To avoid a pressure surge at rotation, the controller prepressurizes the aircraft at a rate of -328 ft/min until the pressure differential reaches 0.1 PSI. At lift off, the controller initiates the climb phase.

CLIMB IN INTERNAL MODE (CI)

CAB V/S varies, according to a preprogrammed law, in order to reach the scheduled CAB ALT at the top of climb defined by the FMGES cruise FL.
The CAB V/S is limited to 1 000 ft/min.



The LDG ELEV selector has no effect in climb.
FL 415 is the FMGES CR FL corresponding to the maximum operating altitude.
If the FMGES CR FL is not available, the CPCS uses the FL 410 default value.

CLIMB IN EXTERNAL MODE (CE)

CAB ALT varies according to FMGES estimated times and planned cruise FL.
The cabin climb rate is limited to 1 000 ft/min.

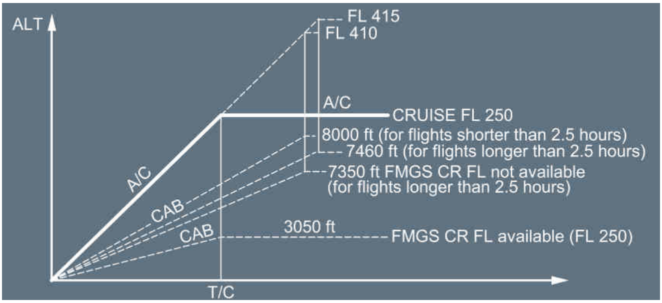
CRUISE (CRZ)

As long as the aircraft remains in level flight, the CPC maintains the cabin altitude at the value reached at top of climb.

The cabin altitude cannot exceed:
- 7 460 ft for flights longer than 2.5 h, or
- 8 000 ft for flights shorter than 2.5 h.

However, if the flight crew sets (manually or in the FMGES) a LDG ELEV higher than the current cabin altitude, the cabin altitude cannot exceed 8 000 ft

Note: *If the takeoff runway is higher than 8 000 ft, the cabin altitude during climb is controlled to 8 000 ft.*


ALT
FL 415
FL 410
A/C
CRUISE FL 250
8000 ft (for flights shorter than 2.5 hours)
7460 ft (for flights longer than 2.5 hours)
7350 ft FMGS CR FL not available
(for flights longer than 2.5 hours)
A/C
CAB
CAB
3050 ft
FMGS CR FL available (FL 250)
T/C

DESCENT IN INTERNAL MODE (DI)

Pressure rate is optimized so that cabin pressure reaches landing field pressure +0.1 PSI just prior to landing. The cabin descent rate is limited to 750 ft/min.

DESCENT IN EXTERNAL MODE (DE)

CAB altitude varies according to FMGES-estimated times, and cabin pressure reaches landing field pressure +0.1 PSI just prior to landing.
The cabin descent rate is limited to 750 ft/min.

ABORT (AB)

The abort mode prevents the cabin altitude from climbing, if the aircraft does not climb after takeoff.
Cabin pressure is set back to the takeoff altitude +0.1 PSI.

GROUND (AFTER LANDING) (GND)

At touchdown, to release the remaining ΔP a depressurized sequence controls the cabin vertical speed at +500 ft/min.
80 s after landing the outflow valves are controlled fully open to ensure there is no residual ΔP in the aircraft.

MAXIMUM DIFFERENTIAL PRESSURE LIMITER FUNCTION

Ident.: DSC-21-20-30-00000800.0001001 / 21 NOV 11
Applicable to: ALL

This function is only available in automatic mode. If the differential pressure is above 8.70 PSI, the CPC maintains the Δp constant, to avoid over-pressurization. As a result, the outflow valves open and the CAB V/S increases. Once the differential pressure has decreased below the threshold, normal automatic control of the valves resumes; this generally causes the valves to go towards the closed position.

CAUTION	Except for the outflow valve position indication and the Δp value on the ECAM PRESS page, there is no indication in the cockpit that the limiter function is activated. Once the Δp limiter function has opened the valves, do not counteract the automatic operation by trying to close the valves in manual mode. Due to the slow movement of the outflow valves in manual mode, the valves cannot be closed fast enough and the cabin altitude quickly increases above 20 000 ft (even if an emergency descent is initiated simultaneously). The automatic mode provides the safest and the quickest way to reduce differential pressure, and recover normal pressure control.

MANUAL PRESSURE CONTROL MODE

Ident.: DSC-21-20-30-00000802.0001001 / 03 MAY 23
Applicable to: ALL

If both automatic systems fail, the flight crew may use the CABIN PRESS control panel to take over manual control of cabin pressurization:

- Press the MODE SEL pushbutton to select MAN, and
- Push the MAN V/S CTL toggle switch to the UP or DN position to increase or decrease cabin altitude.

Depending on the VALVE SEL position, the flight crew manually controls both, or only one, outflow valve(s).
If only one outflow valve is selected, the other one remains under automatic control.

Note: 1. *Due to the slow operation of the outflow valves in manual mode, and the limited resolution of the outflow valves position on the ECAM, the change of the outflow valves position can take up to 5 s on the CAB PRESS SD page.*
2. *ΔP and CAB ALT indications on the CAB PRESS SD page are replaced by "XX" in CPCS MAN mode for cabin altitude below -2 060 ft or above 26 250 ft.*
3. *As the pressurization system is manually controlled, in the case no RPCU is installed, the outflow valves do not automatically open at touchdown. If the RPCU is installed, the outflow valves open automatically.*

DITCHING

Ident.: DSC-21-20-30-00000803.0004001 / 21 MAR 16
Applicable to: ALL

To prepare for ditching, the flight crew must press the DITCHING pushbutton on the CABIN PRESS control panel to close the outflow valves, the emergency ram air inlet, the avionics ventilation overboard valve, and the pack flow control valves.

PREVENTION OF PRESSURIZATION WITH A DOOR NOT CLOSED AND LOCKED

Ident.: DSC-21-20-30-00000804.0001001 / 21 MAR 16
Applicable to: ALL

On ground, at takeoff power application, if at least one door is not closed and locked, the CPC will remain in ground mode (outflow valves open).

Note: *As a backup, the zone controller closes the pack valves (Refer to DSC-21-10-30 Zone Controller).*

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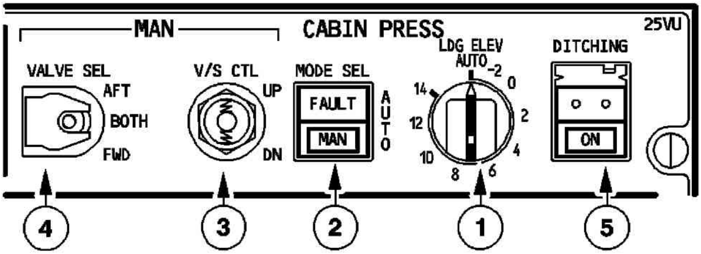
OVERHEAD PANEL

Ident.: DSC-21-20-40-00000805.0005001 / 08 OCT 12
Applicable to: ALL



(1) LDG ELEV selector

AUTO : The pressurization system uses the FMGEC data to construct an optimized pressure schedule.
To leave the AUTO position, pull out and turn the selector.

Other positions : The pressurization schedule does not use the landing elevation from the FMGEC, but instead uses the landing elevation selected with this knob (from -2 000 to 14 000 ft) as its reference.

Note: *The LDG ELEV selector scale is only given as an indication (refer to the ECAM information for accurate adjustment)*

(2) MODE SEL pb

AUTO : Automatic mode is operating. One of the two systems controls the outflow valves.

MAN : This legend appears in white, and FAULT does not come on. The flight crew then uses the MAN V/S CTL selector to control the system.

Note: *Switching the MODE SEL pb to MAN, for at least 3 s, then returning it to AUTO will select the other system.*

FAULT lt : This legend appears in amber and the ECAM caution only comes on when both automatic systems are faulty.

Note: *The pilot may notice variations (up to ± 1 000 ft) in the CAB ALT indication on the ECAM PRESS page, when the system switches from the cabin pressure control AUTO mode to MAN mode, due to reduced resolution of the backup pressure sensor.*

(3) V/S CTL sw

The switch is springloaded to neutral and controls the outflow valve position selected through the VALVE SEL. It controls the MAN motor, when the MODE SEL pb is in the MAN position.

UP : The valve(s) move(s) towards the open position.

DN : The valve(s) move(s) towards the closed position.

(4) VALVE SEL selector

AFT	The aft outflow valve can be manually controlled. The forward outflow valve remains under automatic control.
BOTH (guarded position)	Both outflow valves can be manually controlled.
FWD	The forward outflow valve can be manually controlled. The aft outflow valve remains under automatic control.

(5) DITCHING pb (guarded)

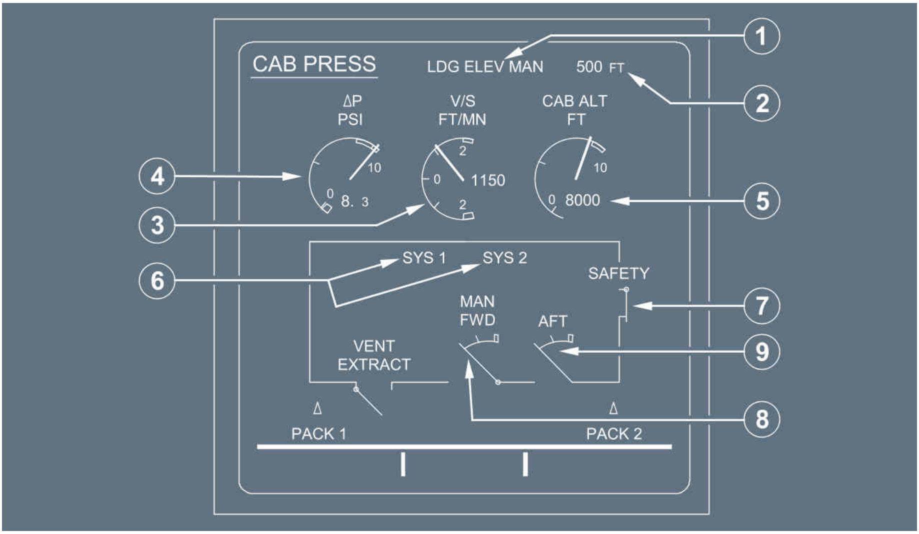
Normal	The system functions normally.
ON	The outflow valves, emergency ram air inlet, avionics ventilation overboard valve, cargo compartment isolation valves and pack flow control valves close. The cargo extract fans stop automatically. The ON light appears in white.

Note: The outflow valve(s) will not close automatically, if it (they) is (are) under manual control.

CAUTION	On ground, if the DITCHING pb is set to ON, with the low pressure ground cart connected and all doors closed, a differential pressure will build up.

ECAM CAB PRESS PAGE

Ident.: DSC-21-20-40-00000806.0003001 / 22 MAY 12
Applicable to: LV-KHT, LV-KHU


CAB PRESS
LDG ELEV MAN
500 FT
ΔP
PSI
V/S
FT/MN
CAB ALT
FT
10
0
8. 3
2
0
1150
2
10
0
8000
SYS 1
SYS 2
SAFETY
MAN
FWD
AFT
VENT
EXTRACT
PACK 1
PACK 2
1
2
3
4
5
6
7
8
9

(1) LDG ELEV AUTO / MAN
The LDG ELEV indication is always white.

AUTO : appears in green when the LDG ELEV selector is in AUTO.
Becomes amber if the landing elevation is not transmitted by the FMGES.

MAN : appears in green when the LDG ELEV selector is not in AUTO.
Neither appear when the MODE SEL pb-sw is in MAN and the VALVE SEL selector is in BOTH, or when the LDG ELEV selector is faulty.

(2) Landing Elevation
Landing elevation selected either automatically by the FMGES or manually by the pilot appears in green. (But not when the MODE SEL pb is in MAN position and the VALVE SEL is in BOTH position).

(3) V/S FT/MIN (cabin vertical speed)
The analog and digital presentation appear in green when V/S is in the normal range.
The digital indication pulses, when the V/S is more than 1 800 ft/min in either climb or descent.

(4) ΔP PSI (Cabin differential pressure)
The analog and digital presentations appear in green when ΔP is the normal range.

They appear in amber when ΔP ≤ -0.2 PSI or ≥ 8.85 PSI.
The digital presentation pulses if ΔP > 1.5 PSI (resets at 1 PSI) during flight phase 7.

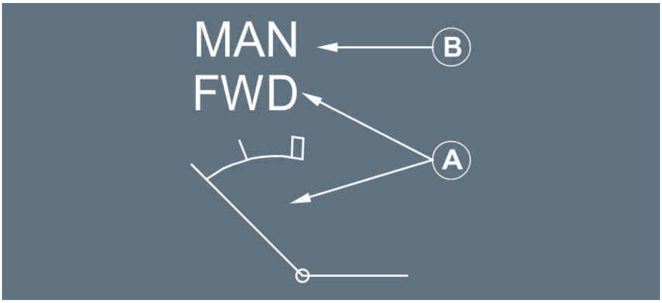
(5) CAB ALT FT (cabin altitude)
The analog and digital presentations appear in green, in normal range.
They appear in red if the cabin altitude goes above 9 550 ft.
The digital presentation pulses if the cabin altitude is between 8 800 ft and 9 550 ft.

(6) Active system indication (SYS 1 or SYS 2 or MAN)
SYS 1 or SYS 2 appears in green when active and in amber when faulty. When either system is inactive, its title does not appear.

(7) Safety valve position
SAFETY appears in white and the diagram in green when the three safety valves are fully closed.
SAFETY and the diagram appear in amber when at least one valve is not closed.

Note: The safety valves open when the cabin differential pressure is between 8.75 and 8.95 PSI.

(8) Forward outflow valve position



(A) When the valve is operating, normally, the needle appears in green and FWD appears in white.

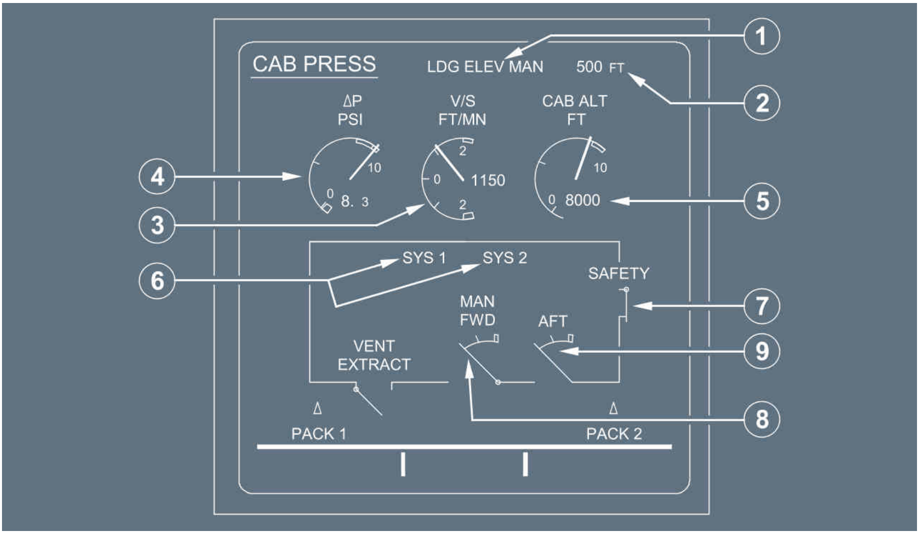
Both become amber when the valve:
- Opens more than 95 % during flight, or
- Fails under automatic control.

(B) When the valve is under manual control MAN appears in green.

(9) Aft outflow valve position
Identical to the forward outflow valve.

ECAM CAB PRESS PAGE

Ident.: DSC-21-20-40-00000806.0004001 / 02 SEP 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


CAB PRESS
LDG ELEV MAN
500 FT
ΔP
PSI
V/S
FT/MN
CAB ALT
FT
10
0
8. 3
2
0
1150
2
10
0
8000
SYS 1
SYS 2
SAFETY
MAN
FWD
AFT
VENT
EXTRACT
PACK 1
PACK 2
1
2
3
4
5
6
7
8
9

(1) LDG ELEV AUTO / MAN
The LDG ELEV indication is always white.

AUTO : appears in green when the LDG ELEV selector is in AUTO.
Becomes amber if the landing elevation is not transmitted by the FMGES.

MAN : appears in green when the LDG ELEV selector is not in AUTO.
Neither appear when the MODE SEL pb-sw is in MAN and the VALVE SEL selector is in BOTH, or when the LDG ELEV selector is faulty.

(2) Landing Elevation
Landing elevation selected either automatically by the FMGES or manually by the pilot appears in green. (But not when the MODE SEL pb is in MAN position and the VALVE SEL is in BOTH position).

(3) V/S FT/MIN (cabin vertical speed)
The analog and digital presentation appear in green when V/S is in the normal range.
The digital indication pulses, when the V/S is more than 1 800 ft/min in either climb or descent.

(4) ΔP PSI (Cabin differential pressure)
The analog and digital presentations appear in green when ΔP is the normal range.

They appear in amber when ∆P ≤ -0.2 PSI or ≥ 8.85 PSI.
The digital presentation pulses if ∆P > 1.5 PSI (resets at 1 PSI) during flight phase 7.

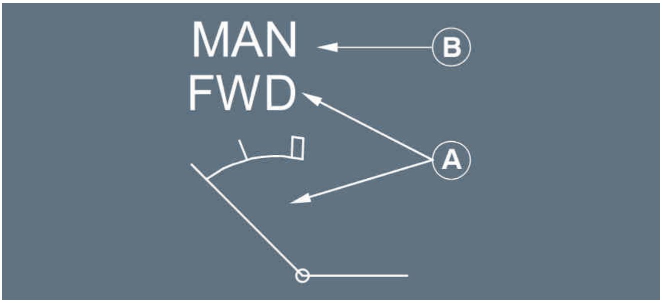
(5) CAB ALT FT (cabin altitude)
The analog and digital presentations appear in green, in normal range.
They appear in red if the cabin altitude goes above 9 550 ft.
The digital presentation pulses if the cabin altitude is between 8 800 ft and 9 550 ft.

(6) Active system indication (SYS 1 or SYS 2 or MAN)
SYS 1 or SYS 2 appears in green when active and in amber when faulty. When either system is inactive, its title does not appear.

(7) Safety valve position
SAFETY appears in white and the diagram in green when the three safety valves are fully closed.
SAFETY and the diagram appear in amber when at least one valve is not closed.

Note: The safety valves open when the cabin differential pressure is between 8.75 and 8.95 PSI.

(8) Forward outflow valve position



(A) When the valve is operating, normally, the needle appears in green and FWD appears in white.

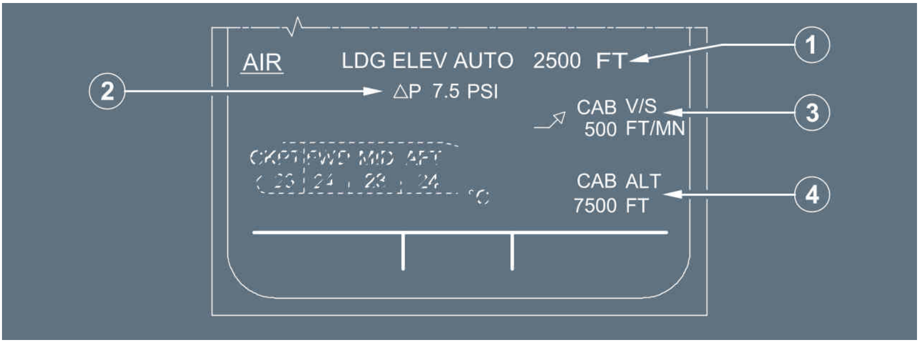
Both become amber when the valve:
- Opens more than 95 % during flight under automatic control, or
- Fails under automatic control.

(B) When the valve is under manual control MAN appears in green.

(9) Aft outflow valve position
Identical to the forward outflow valve.

ECAM CRUISE PAGE

Ident.: DSC-21-20-40-00000807.0001001 / 21 MAR 16
Applicable to: ALL

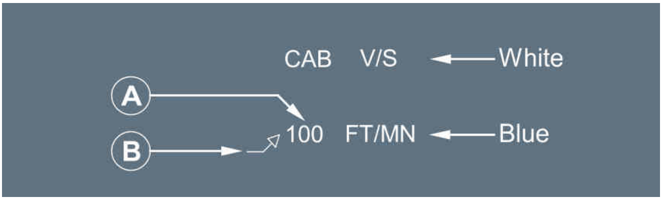

AIR
LDG ELEV AUTO 2500 FT
ΔP 7.5 PSI
CAB V/S
500 FT/MN
CKPT FWD MID AFT
23 24 23 24
°C
CAB ALT
7500 FT
1
2
3
4

(1) LDG ELEV AUTO/MAN
Identical to the CAB PRESS page.

(2) ΔP indication

- It is normally in green.
- It pulses green between 1.5 and 8.85 PSI, when the aircraft is in final approach.
- It becomes amber below -0.2 PSI, or above +8.85 PSI.

(3) CAB V/S FT/MN (cabin vertical speed indication)
In AUTO PRESS mode


CAB V/S
White
A
B
100 FT/MN
Blue

(A) Absolute value of cabin vertical speed is normally green.
It pulses green above 1 800 ft/min or below – 1 800 ft/min.

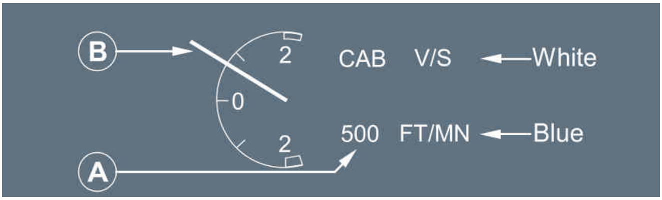
(B)

↗ : displayed green when the cabin vertical speed is between 25 and 1 800 ft/min.
pulsing green when the cabin vertical speed is above 1 800 ft/min.

↘ : displayed green when the cabin vertical speed is between -1 800 and -25 ft/min.
pulsing green when the cabin vertical speed is below -1 800 ft/min.

nothing is displayed when the cabin vertical speed is between -25 and +25 ft/min.

In MAN PRESS mode (MODE SEL pushbutton at MAN and VALVE SEL at BOTH position):



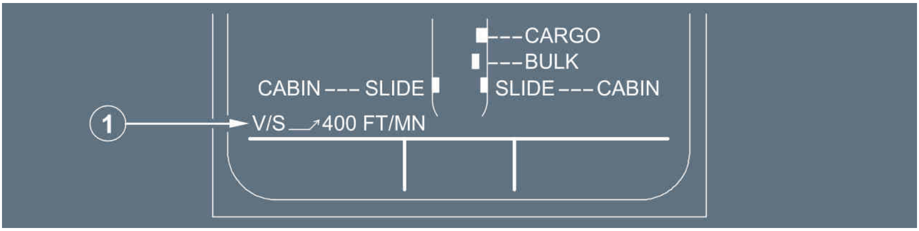
(A) Identical to AUTO PRESS mode, but minus sign is added for negative values.

(B) The needle for the cabin vertical speed indication is normally green.
It pulses green below -1 800 ft/min or above +1 800 ft/min.

(4) CAB ALT FT (cabin altitude indication)
Refer to CAB ALT value on CAB PRESS page.

ECAM DOOR/OXY PAGE

Ident.: DSC-21-20-40-00000808.0001001 / 09 OCT 12
Applicable to: ALL



(1) V/S (cabin vertical speed)
Identical with cabin vertical speed indication on cruise page when in AUTO PRESS mode.

MEMO DISPLAY

Ident.: DSC-21-20-40-00017068.0001001 / 21 MAR 16
Applicable to: ALL

MAN LDG ELEV : This memo appears in green, if the LDG ELEV selector is not in the AUTO position. This memo becomes amber in flight phases 1 and 2.

GENERAL

Ident.: DSC-21-30-10-00018210.0001001 / 21 MAR 16
Applicable to: ALL

The ventilation system includes the avionics ground cooling ◁✻ and ventilation for :
- The avionics,
- The batteries,
- The lavatories and galleys,
- The pack bay.

Note: *Refer to DSC-21-40-10 General for a description of the cargo ventilation.*

Two computers are provided:
- The Avionic Equipments Ventilation Controller (AEVC), and
- The Ventilation Controller.

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GENERAL

Ident.: DSC-21-30-20-00000826.0001001 / 21 MAR 16
Applicable to: ALL

The avionics ventilation system is fully automatic.
It cools the electrical and electronic components, in the electronic bay and flight deck (including the instruments).
It uses air recirculated from the cabin, and extracts air from the different panels and equipments racks.

MAIN COMPONENTS

Ident.: DSC-21-30-20-00000825.0001001 / 21 MAR 16
Applicable to: ALL

TWO CABIN FANS

Two electric fans operate continuously, as long as the aircraft's electrical system is supplied.
These fans can be simultaneously cut off via the CABIN FAN pushbutton.
They make circulate the air around the avionics equipment, and blow to the mixer unit of the air conditioning system through the recirculation valves.

RECIRCULATION VALVES

The recirculation valves are normally open, and are partially closed automatically by the ventilation controller, when both packs are OFF (provided that both CABIN FANS are ON) to ensure sufficient air flow to avionic.

EXTRACT FAN

The extract fan operates continuously, as long as the aircraft's electrical system is supplied, and it blows air through the underfloor extract or overboard extract valve.

UNDERFLOOR AND OVERBOARD EXTRACT VALVES

These valves are fitted with actuators, controlled by the Avionics Equipment Ventilation Computer (AEVC), or by the EXTRACT pushbutton from the flight deck.
Air is blown overboard through the overboard extract valve.
Through the underfloor extract valve, air is blown under the forward cargo compartment, then overboard through the outflow valve.

COOLING EFFECT DETECTOR (CED)

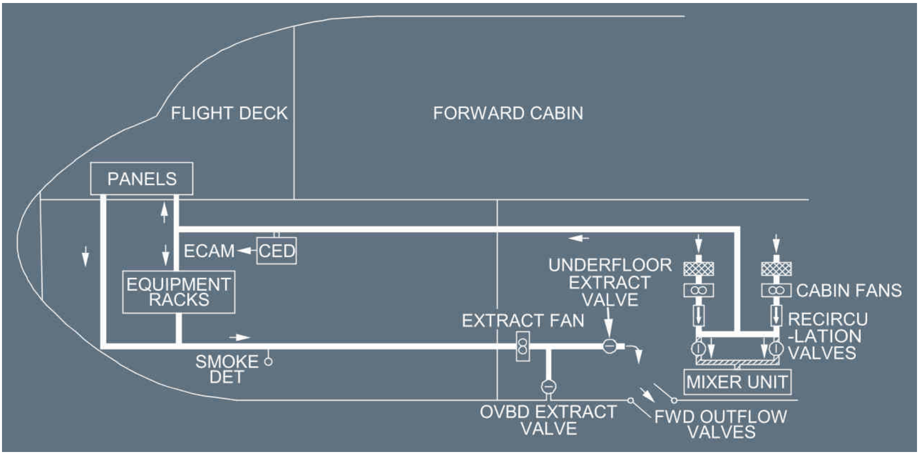
This detector triggers an ECAM caution when the cooling capacity (flow and temperature) of the blown air is abnormal. On ground, it also activates the external horn and the external warning light.

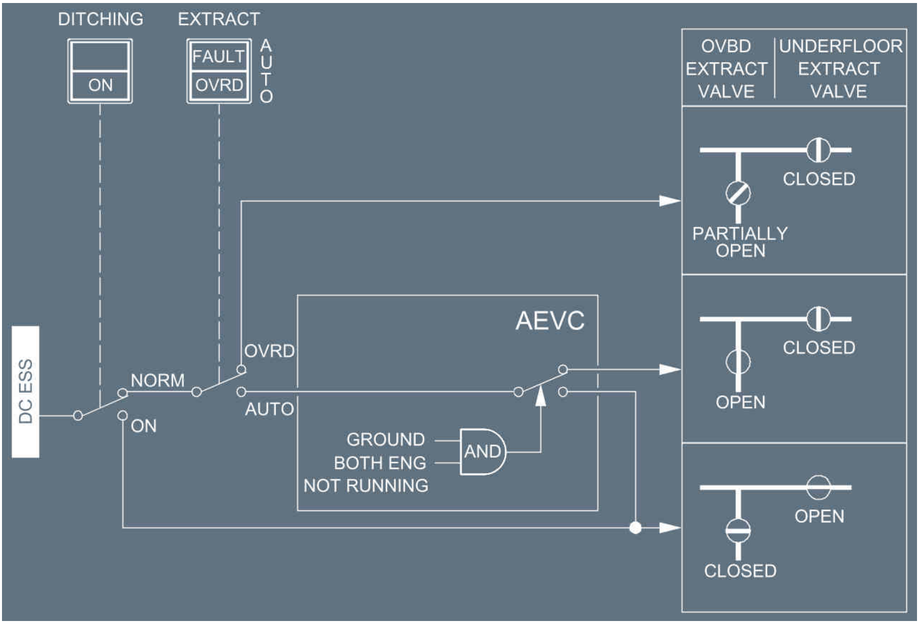
AVIONICS EQUIPMENT VENTILATION COMPUTER (AEVC)

This Computer controls the position of the underfloor and OVBD extract valves.

SCHEMATICS

Ident.: DSC-21-30-20-00000827.0005001 / 09 OCT 12
Applicable to: ALL


FLIGHT DECK
FORWARD CABIN
PANELS
ECAM
CED
EQUIPMENT RACKS
UNDERFLOOR EXTRACT VALVE
CABIN FANS
EXTRACT FAN
RECIRCU -LATION VALVES
SMOKE DET
MIXER UNIT
OVBD EXTRACT VALVE
FWD OUTFLOW VALVES


DITCHING
ON
EXTRACT
FAULT
OVRD
AUTO
OVBD EXTRACT VALVE
UNDERFLOOR EXTRACT VALVE
CLOSED
PARTIALLY OPEN
AEVC
OVRD
CLOSED
OPEN
DC ESS
NORM
ON
AUTO
GROUND
BOTH ENG
NOT RUNNING
AND
OPEN
CLOSED

SYSTEM OPERATION

Ident.: DSC-21-30-20-00000828.0004001 / 21 MAR 16
Applicable to: ALL

The cabin and the extract fans operate continuously. Air, recirculated from the cabin, is provided to the avionics compartment and the flight deck instrument panels.

Note: *In case of failure of two cabin fans, fresh air is blown from the packs.*

In normal operation, fresh air is blown by the extract fan :

- On ground, engines not running : Through the OVBD extract valve (the underfloor extract valve is closed).
- In flight, or on ground, with engines running : Through the underfloor extract valve (the OVBD extract valve is closed).

If OVRD is selected on the EXTRACT pushbutton, air is blown through the OVBD extract valve which is partially open (the underfloor extract valve is closed).
When the DITCHING pushbutton is ON, the OVBD extract valve is closed and the underfloor extract valve is open, whatever the position of the EXTRACT pushbutton.

Intentionally left blank

GENERAL

Ident.: DSC-21-30-30-00018209.0001001 / 21 MAR 16
Applicable to: ALL

The avionics ground cooling ◁ is fully automatic.
On ground, it ensures the cooling of the avionics ventilation air, in case of extremely hot outside air.
The cooling system is integrated in the avionics ventilation system, but operates independently.

Intentionally left blank

BATTERY VENTILATION

Ident.: DSC-21-30-40-00000829.0001001 / 21 MAR 16
Applicable to: ALL

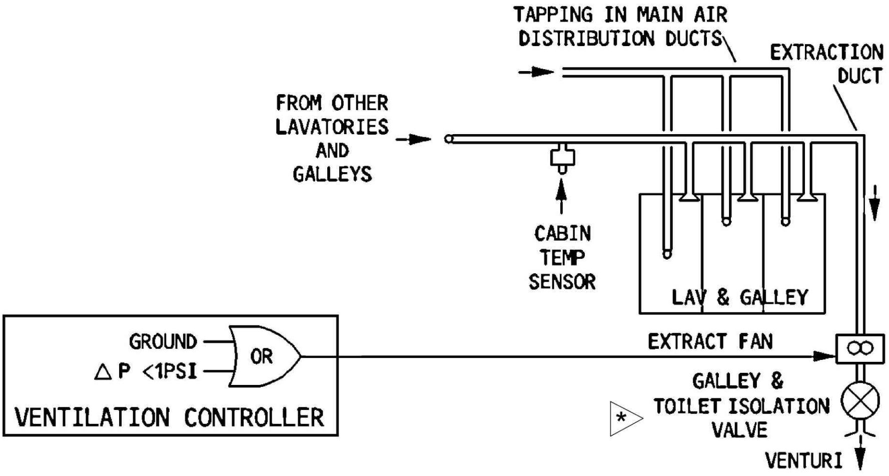
A venturi in the aircraft skin draws air from the space around the batteries and vents it overboard. The resulting airflow ventilates the batteries.

Intentionally left blank

LAVATORY AND GALLEY VENTILATION

Ident.: DSC-21-30-50-00018196.0002001 / 21 MAR 16
Applicable to: ALL

The lavatory and galley are ventilated with air from main cabin distribution system.
Air is discharged outside through a venturi. On ground, or when ΔP < 1 PSI, it is extracted by an electrical fan controlled by the ventilation controller.
Ventilation of the cabin temperature sensors is connected to the extraction duct.


TAPPING IN MAIN AIR DISTRIBUTION DUCTS
EXTRACTION DUCT
FROM OTHER LAVATORIES AND GALLEYS
CABIN TEMP SENSOR
LAV & GALLEY
GROUND
ΔP <1PSI
OR
VENTILATION CONTROLLER
EXTRACT FAN
GALLEY & TOILET ISOLATION VALVE
*
VENTURI

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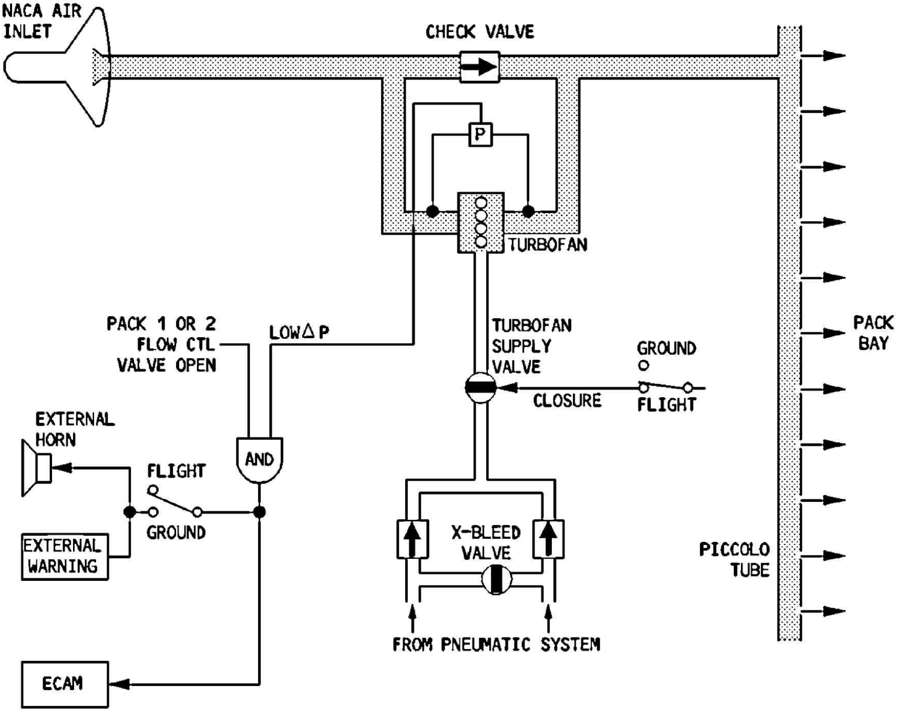
PACK BAY VENTILATION

Ident.: DSC-21-30-70-00000831.0004001 / 21 MAR 16
Applicable to: ALL

Ventilation of the pack bay ensures air circulation in order to maintain, on ground and in flight, a mean temperature that is compatible with the structure constraints in the relevant area.
In flight, air from the outside flows into the pack bay through a NACA air inlet.
On ground, a turbofan provides sufficient airflow.
The turbofan is driven by air from the bleed system, which is supplied through the turbofan supply valve. Controlled by the AEVC, the fan operates when the aircraft is on ground.
An ECAM warning, associated with an external horn on ground, is triggered in case of failure of the turbofan (supply valve failed closed or turbofan jammed).


NACA AIR INLET
CHECK VALVE
P
TURBOFAN
PACK 1 OR 2 FLOW CTL VALVE OPEN
LOW∆P
TURBOFAN SUPPLY VALVE
GROUND
CLOSURE
FLIGHT
EXTERNAL HORN
AND
FLIGHT
GROUND
EXTERNAL WARNING
X-BLEED VALVE
FROM PNEUMATIC SYSTEM
PICCOLO TUBE
PACK BAY
ECAM

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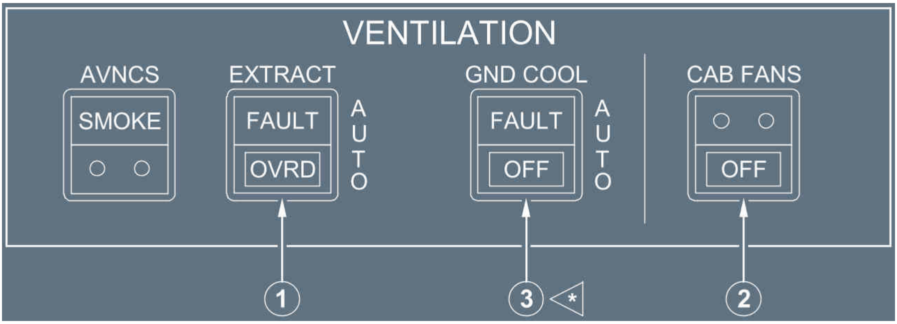
OVERHEAD PANEL

Applicable to: ALL

Ident.: DSC-21-30-80-A-00018198.0010001 / 21 MAR 16

VENT PANEL



(1) EXTRACT pb

AUTO : On ground, with both engines not running, the underfloor extract valve is closed and the OVBD extract valve is open, provided DITCHING is not selected.
In flight, or on ground, with at least one engine running, the underfloor extract valve is open and the OVBD extract valve is closed.

OVRD : The underfloor extract valve closes and the OVBD extract valve partially opens, provided DITCHING is not selected.

FAULT lt : The amber light and associated ECAM caution come on, when an extract low flow is detected in the avionics compartment.
The FAULT light goes out when OVRD is selected.

(2) CAB FAN pb
(*Refer to DSC-21-10-50 Overhead Panel (Cont'd)*)

(3) GND COOL pb ◁*

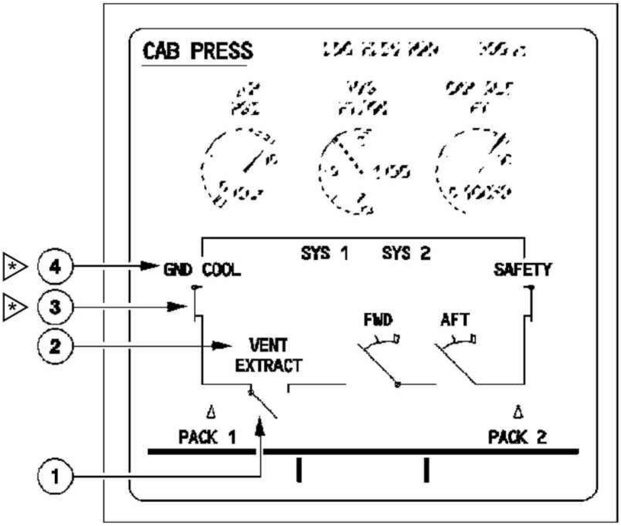
AUTO : The ground cool valve opens. The ground cooling fan and the ground cool unit will automatically start, provided the aircraft is on ground, the engines are stopped, and the temperature of cabin recirculated air is above 27 °C.

OFF : The ground cool unit stops, the valve closes, and the fan stops.

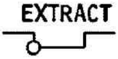
FAULT lt : The amber light, associated ECAM caution, and ground crew call system activate when a fault is detected in the ground cool unit, valve or fan.

ECAM CAB PRESS PAGE

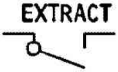
Ident.: DSC-21-30-80-00018199.0002001 / 21 MAR 16
Applicable to: ALL


CAB PRESS
*
4
GND COOL
SYS 1
SYS 2
SAFETY
*
3
2
FWD
AFT
VENT
EXTRACT
PACK 1
PACK 2
1

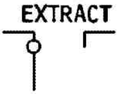
(1) OVBD extract valve position indication



This indicates that the OVBD extract valve is fully closed.



This indicates that the OVBD extract valve is partially open.



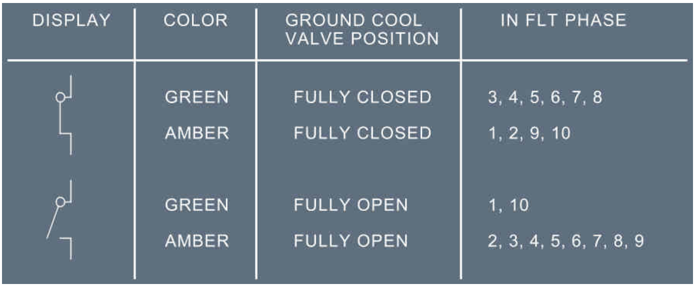
This indicates that the OVBD extract valve is fully open.

The EXTRACT indication normally appears in white and the valve symbol is in green.
Both become amber in case of an abnormal position.
If the valve position is not available, XX appears in amber.

(2) VENT indication

This normally appears in white.
It becomes amber in case of extract low flow.

(3) GND COOL VALVE position



DISPLAY	COLOR	GROUND COOL VALVE POSITION	IN FLT PHASE
	GREEN	FULLY CLOSED	3, 4, 5, 6, 7, 8
	AMBER	FULLY CLOSED	1, 2, 9, 10
	GREEN	FULLY OPEN	1, 10
	AMBER	FULLY OPEN	2, 3, 4, 5, 6, 7, 8, 9

(4) GND COOL indication

This normally appears in white.
It becomes amber when the ground cool valve is displayed in amber or when the ground cooling system is faulty.

Intentionally left blank

GENERAL

Ident.: DSC-21-40-10-00000004.0001001 / 21 MAR 16
Applicable to: ALL

The system provides ventilation and heating to the cargo compartments. It is controlled by the ventilation controller which has two channels. Channel 2 is a backup in case of channel 1 failure.

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BULK CARGO COMPARTMENT

Ident.: DSC-21-40-20-00000023.0002001 / 15 FEB 11
Applicable to: ALL

VENTILATION

Air from the cabin goes via the inlet isolation valve to the bulk cargo compartment, and is driven by an extraction fan. Air is controlled by the outlet isolation valve, goes to the bilge, then through the aft outflow valve.

NORMAL OPERATION

The cargo ventilation controller controls the inlet and outlet isolation valves and the extraction fan. The ventilation system operates when the isolation valves are open. To open the isolation valves, switch the BULK ISOL VALVE pb to the on position.

The controller closes the isolation valves and stops the extract fan, when:
- The flight crew selects the BULK ISOL VALVE pb to OFF, or
- The bulk cargo smoke detection unit detects smoke.

The outlet valve closes and the extract fan stops, when the flight crew sets the DITCHING pb to ON.
In case of overheat, the extract fan stops and the OVHT COND FANS RESET FAULT light comes on, on the maintenance panel.

HEATING

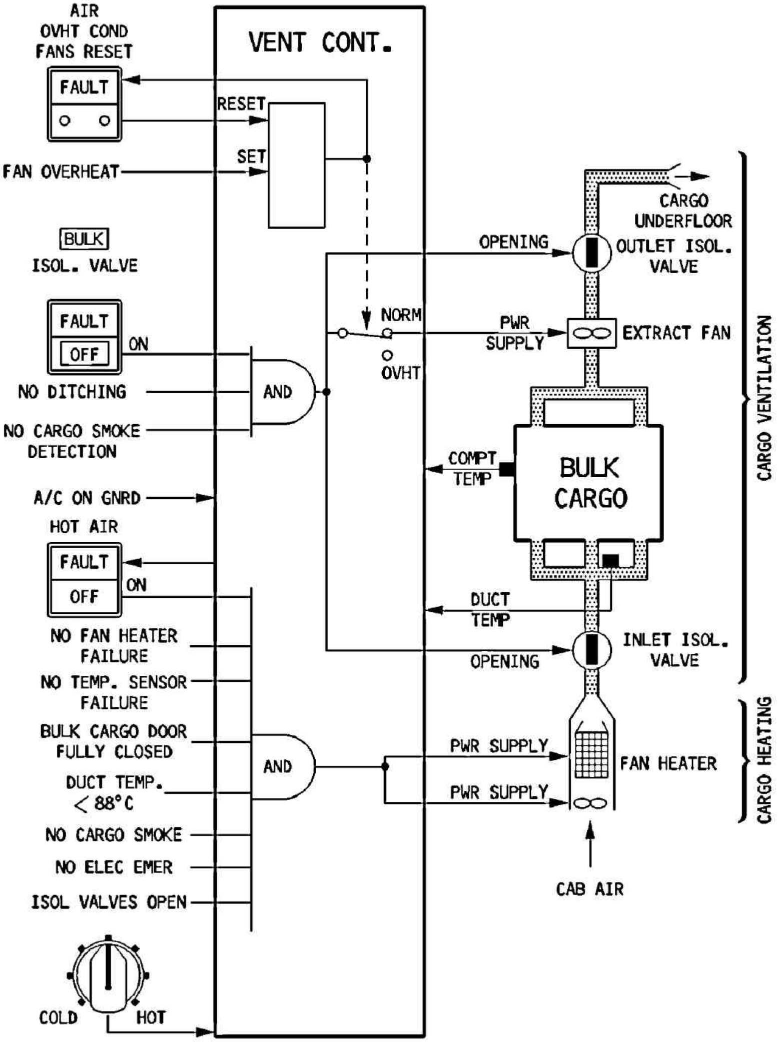
Bulk cargo compartment heating is performed by an electrical fan heater. Air from the cabin, driven by the electrical fan, goes into the compartment through a heating element. The temperature demand is selected from the cockpit.

NORMAL OPERATION

Provided the cargo door is closed, the heater operates when the temperature sensors indicate that the compartment air temperature is less than the selected one.

ON GROUND OPERATION

When the bulk cargo door is open, electrical power no longer supplies the heating element of the fan heater. Compartment heating is unavailable, as long as cargo door remains open.


AIR
OVHT COND
FANS RESET
FAULT
VENT CONT.
RESET
SET
FAN OVERHEAT
BULK
ISOL. VALVE
FAULT
OFF
ON
NORM
OVHT
NO DITCHING
AND
NO CARGO SMOKE
DETECTION
A/C ON GNRD
HOT AIR
FAULT
ON
OFF
NO FAN HEATER
FAILURE
NO TEMP. SENSOR
FAILURE
BULK CARGO DOOR
FULLY CLOSED
DUCT TEMP.
< 88°C
NO CARGO SMOKE
NO ELEC EMER
ISOL VALVES OPEN
AND
COLD
HOT
CARGO
UNDERFLOOR
OPENING
OUTLET ISOL.
VALVE
PWR
SUPPLY
EXTRACT FAN
COMPT
TEMP
BULK
CARGO
DUCT
TEMP
OPENING
INLET ISOL.
VALVE
CARGO VENTILATION
PWR SUPPLY
PWR SUPPLY
FAN HEATER
CARGO HEATING
CAB AIR

FWD CARGO COMPARTMENT

Ident.: DSC-21-40-20-00004800.0005001 / 25 APR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

VENTILATION AND COOLING

Due to the extract fan suction, the cabin air flows through the inlet isolation valves into the forward cargo compartment, via the sidewall and ceiling inlets. Air is extracted through outlets, on the opposite sidewall, and goes via the extract fan and outlet isolation valve to the underfloor bilge area near the forward outflow valve.
To decrease compartment temperature, the inlet ventilation air is mixed with cold air from Pack 2. The cold air valve has three positions to adjust the quantity of cooled conditioned air that is mixed with the ventilation air. The valve position is selected from the cockpit.

Note: 1. *In general, if COOLING is selected at NORM or MAX, the parameters could be different between both packs.*
2. *Below 20 000 ft , pack 2 outlet temperature is limited to 5 °C, in order to avoid ice accumulation on the cold air valve.*

NORMAL OPERATION

The cargo ventilation controller controls the inlet and outlet isolation valves and the extraction fan.

The controller closes the isolation valves and stops the extract fan, when:
a. The FWD ISOL VALVE pb is switched OFF, or
b. The forward cargo smoke detection system is triggered, or
c. The DITCHING pb on the CABIN PRESS panel is switched ON.

In case of an overheat, the extract fan stops, and the OVHT COND FANS RESET FAULT light, on the maintenance panel, comes on.

The cold air valve will be fully closed, when :
- The COOLING selector is set to OFF, or
- The forward cargo smoke detection system is triggered, or
- The forward cooling system fails, or
- At least one pack is off.

HEATING

To provide variable temperature, inlet air is mixed with the hot air ducted upstream of PACK 1. The forward cargo trim air valve controls the quantity of hot air added.
The temperature is selected from the cockpit.

NORMAL OPERATION

When the HOT AIR 1 pushbutton (*Refer to DSC-21-10-50 Overhead Panel*) is switched ON, hot air is added to the cargo ventilation system. A trim air valve controls the quantity of hot air. The Ventilation Controller controls the position of this trim air valve, according to the sensed duct temperature and to the selected temperature. Manually switching the HOT AIR 1 pushbutton to OFF stops the heating.

Note: *If there is a failure in one of the hot air supplies, the hot air crossvalve opens. The forward cargo compartment supply remains, either through Channel 1 (Channel 2 failure), or through Channel 2 (Channel 1 failure).*

If the forward cargo compartment heating system is stopped via the HOT AIR 1 pushbutton, temperature control for the respective cabin zones (*Refer to DSC-21-10-50 Overhead Panel*) is also lost.

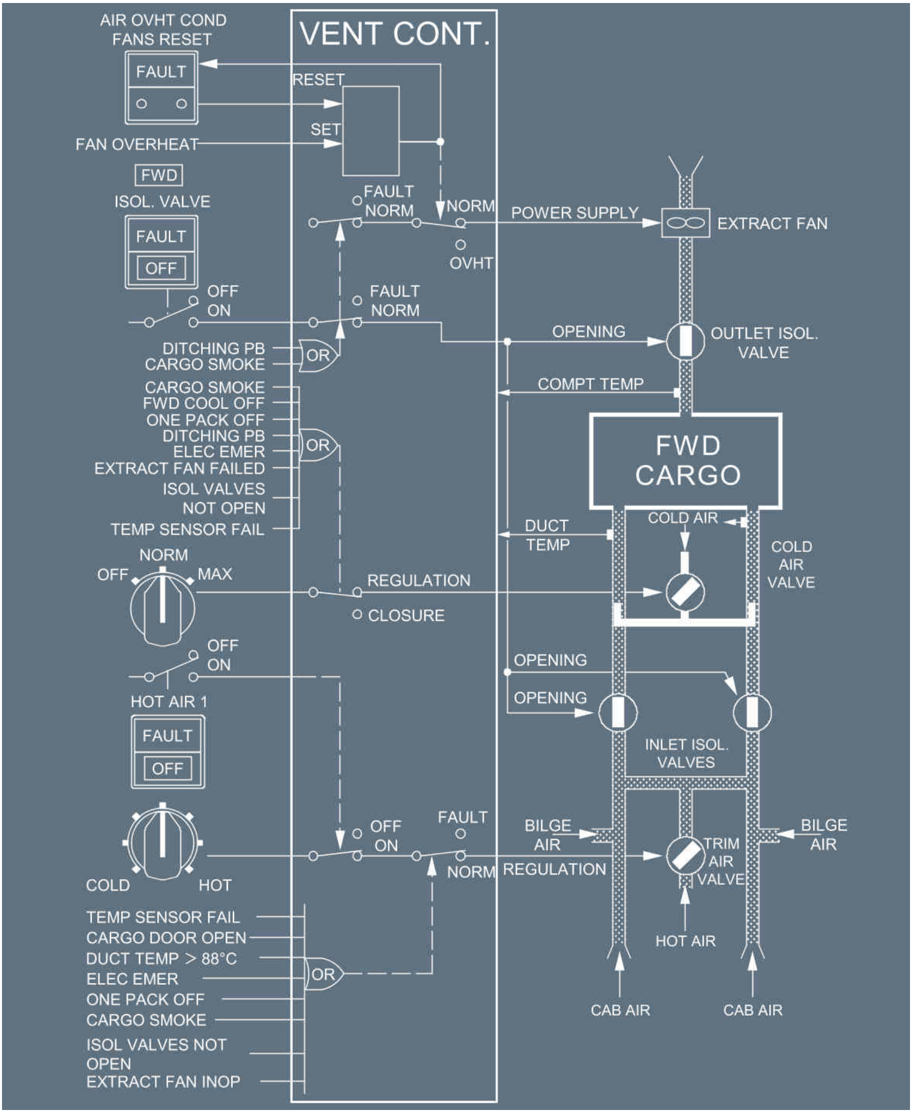
ON GROUND OPERATION

The trim air valve closes when the forward cargo door opens. Compartment heating is unavailable, as long as the cargo door remains open.

SCHEMATIC

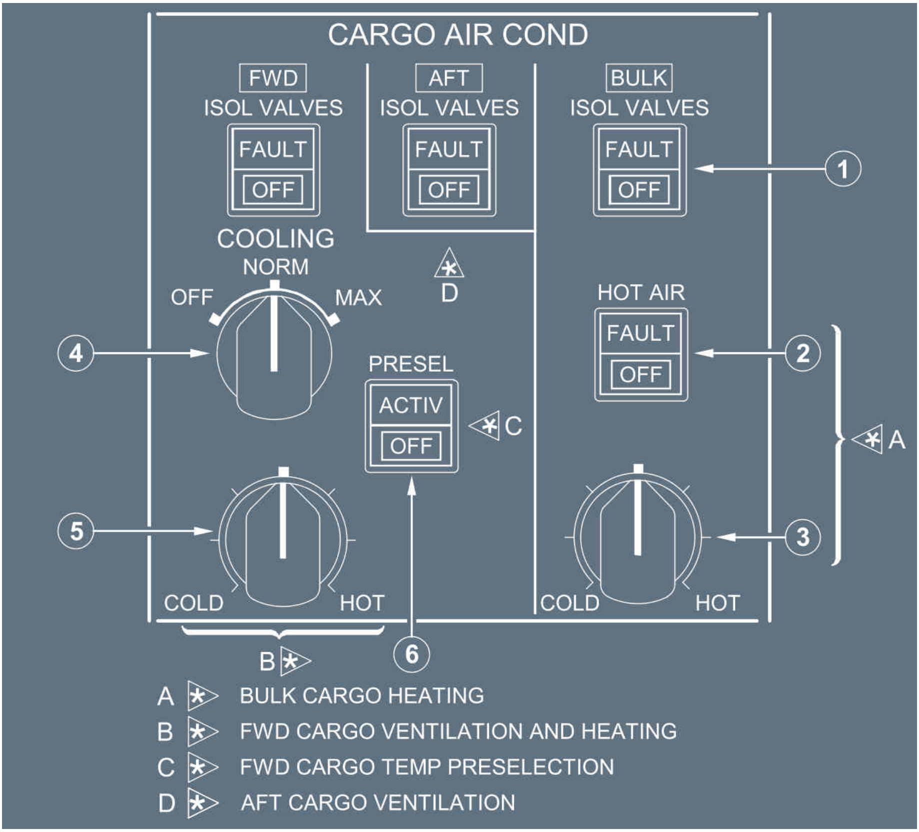
Ident.: DSC-21-40-20-00004801.0002001 / 17 MAR 11

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


AIR OVHT COND FANS RESET
FAULT
FAN OVERHEAT
FWD
ISOL. VALVE
FAULT
OFF
OFF
ON
DITCHING PB
CARGO SMOKE
OR
CARGO SMOKE
FWD COOL OFF
ONE PACK OFF
DITCHING PB
ELEC EMER
EXTRACT FAN FAILED
ISOL VALVES NOT OPEN
TEMP SENSOR FAIL
OR
NORM
OFF
MAX
OFF
ON
HOT AIR 1
FAULT
OFF
COLD
HOT
TEMP SENSOR FAIL
CARGO DOOR OPEN
DUCT TEMP > 88°C
ELEC EMER
ONE PACK OFF
CARGO SMOKE
ISOL VALVES NOT OPEN
EXTRACT FAN INOP
OR
VENT CONT.
RESET
SET
FAULT
NORM
NORM
OVHT
FAULT
NORM
REGULATION
CLOSURE
OFF
ON
FAULT
NORM
POWER SUPPLY
EXTRACT FAN
OPENING
OUTLET ISOL. VALVE
COMPT TEMP
FWD CARGO
COLD AIR
DUCT TEMP
COLD AIR VALVE
OPENING
OPENING
INLET ISOL. VALVES
BILGE AIR
REGULATION
TRIM AIR VALVE
BILGE AIR
HOT AIR
CAB AIR
CAB AIR

OVERHEAD CARGO AIR COND PANEL

Ident.: DSC-21-40-30-00000030.0001001 / 21 MAR 17
Applicable to: ALL


CARGO AIR COND
FWD ISOL VALVES
FAULT
OFF
AFT ISOL VALVES
FAULT
OFF
BULK ISOL VALVES
FAULT
OFF
1
COOLING
NORM
OFF
MAX
D
HOT AIR
FAULT
OFF
2
4
PRESEL
ACTIV
OFF
C
A
5
COLD
HOT
3
COLD
HOT
B
6

A ✱ BULK CARGO HEATING
B ✱ FWD CARGO VENTILATION AND HEATING
C ✱ FWD CARGO TEMP PRESELECTION
D ✱ AFT CARGO VENTILATION

(1) ISOL VALVE pushbutton

On : The inlet and outlet isolation valves open, and the extraction fan runs. If smoke is detected in the cargo compartment, or DITCHING is selected, the valves close and the fan stops.

OFF : The inlet and outlet isolation valves close, and the extraction fan stops.

FAULT lt : The amber light and associated ECAM caution come on, when either inlet or outlet valve is not in the selected position.

(2) HOT AIR pushbutton

ON : The fan heater operates, provided the BULK cargo compartment temperature is below the selected one, and the BULK cargo door is closed.

OFF : The fan heater stops. Inlet air is not heated.

FAULT lt : The amber light, and associated ECAM message, come on when the duct overheats (above 88 °C/190 °F). The light goes off, when the temperature drops below 70 °C (158 °F), and OFF is selected. The fan heater stops.

(3) Temperature selector

COLD : 5 °C (41 °F)
HOT : 25 °C (79 °F)
Middle position : 15 °C (60 °F)

Note: *Cargo compartment temperature may vary due to such factors as flight duration, outside temperature, and cabin temperature. As a result, the actual temperature may be higher than the one indicated by the selector position.*

(4) Cargo COOLING selector

OFF : The cold air valve is closed. No cold air is added to the ventilation air.

NORM : The cold air valve is partially open for normal operation.

MAX : The cold air valve is fully open. Maximum quantity of cold air is supplied to cool the forward cargo compartment.

(5) Temperature selector

COLD : 5 °C (41 °F)
HOT : 25 °C (79 °F)
Middle position : 15 °C (60 °F)

(6) FWD PRESEL pushbutton

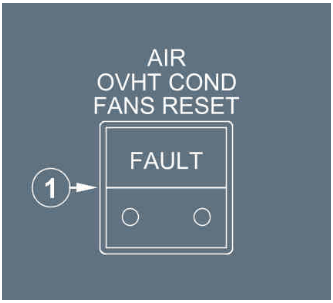
ACTIV lt : The light comes on green, when FWD PRESEL is set to ON, or the cargo compartment service panel's ON/OFF toggle is momentarily switched to ON. Once this toggle switch is ON, the temperature can be preselected on the forward cargo compartment service panel.

OFF : ACTIV light goes out. Temperature selection from the cockpit overrides the temperature preselected from the service panel.

Note: *The preselection system is automatically set to OFF, when the forward cargo door is opened after a flight.*

OVERHEAD MAINTENANCE PANEL

Ident.: DSC-21-40-30-00000067.0001001 / 09 OCT 12
Applicable to: ALL

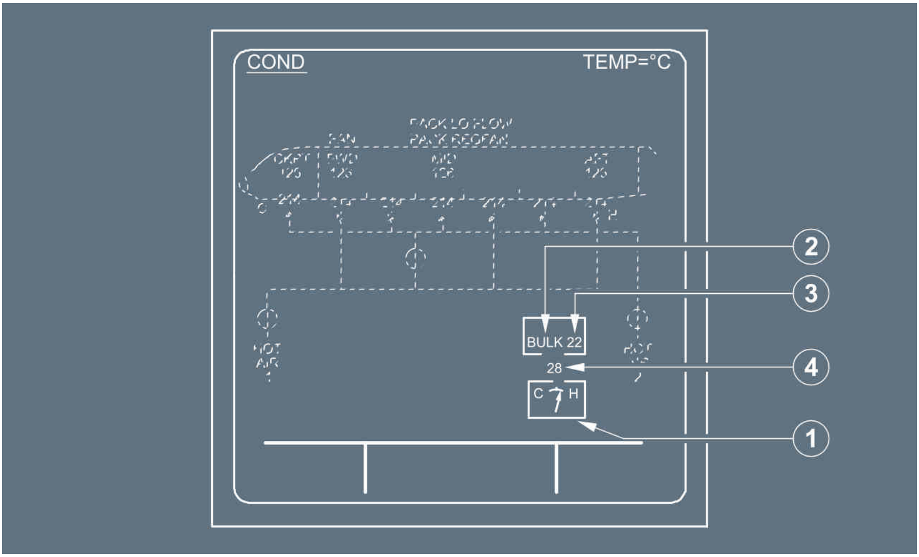


(1) OVHT COND FANS RESET pushbutton

FAULT lt : The light comes on amber when any fan overheat occurs. Fan is stopped. To resume fan operation press the OVHT COND FANS RESET pushbutton (FAULT light goes out).

ECAM COND PAGE

Ident.: DSC-21-40-30-00004803.0002001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP



(1) Bulk fan heater
The arrow is normally green. It becomes amber, if the heater fails.
C - Cold (green) : The heater operates at its lowest level.
H - Hot (green) : The heater operates at its highest level.

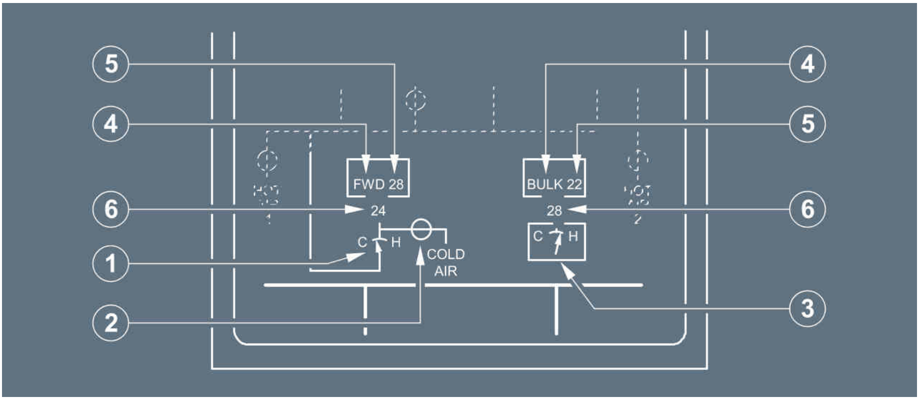
(2) Compartment Indication
This indication is displayed in white.

(3) Compartment Temperature Indication
This indication is displayed in green.

(4) Compartment Duct Temperature Indication
It is normally green. It becomes amber, in case of a duct overheat (when the temperature is above 88 °C for 5 s).

ECAM COND PAGE

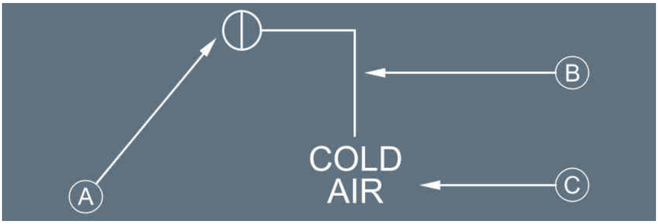
Ident.: DSC-21-40-30-00004803.0006001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



(1) Trim air valve (Heating)

H - Hot (Green) : Valve is open.
C - Cold (Green) : Valve is closed.
Amber, if the valve fails.

(2) COLD AIR VALVE



(A)

In line – Green : Valve is fully open.
In line – Amber : Valve is failed open.
In transit – Green : Valve is partially open.
In transit – Amber : Valve is failed partially open, or in transit
Cross line – Green : Valve is fully closed.
Cross line – Amber : Valve is failed closed.

Note: *The color of the symbol changes from green to amber, if one of the two pack flow control valves is fully closed, independent of the cold air valve position.*

(B) This indication is in green either when the pack flow control valves are not fully closed, or when positions are not available. It becomes amber when one of the two valves is fully closed.

(C) This indication is in white.

(3) Bulk fan heater
The arrow is normally green. It becomes amber, if the heater fails.

C - Cold (green) : The heater operates at its lowest level.

H - Hot (green) : The heater operates at its highest level.

(4) Compartment Indication
This indication is displayed in white.

(5) Compartment Temperature Indication
This indication is displayed in green.

(6) Compartment Duct Temperature Indication
It is normally green. It becomes amber, in case of a duct overheat (when the temperature is above 88 °C for 5 s).

AIRCRAFT SYSTEMS

AUTO FLIGHT - GENERAL

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DSC-22_10-10 Description

FMGEC Standard........A
FMGEC Standard........B
FMGEC Standard........C
Preamble........D
Description........E
General Philosophy........F
Flight Management Guidance and Envelope Computer (FMGEC)........G
Multipurpose Control and Display Unit (MCDU)........H
Flight Control Unit (FCU)........I
FM Source Selector........J
Other Flight Crew Interfaces........K
Flight Crew Interface with FMGEC........L
Fault Isolation and Detection System........M

DSC-22_10-20 System Interface Diagram

System Interface Diagram........A

DSC-22_10-30 FMGES Modes of Operation

General........A
Dual Mode........B
Independent Mode........C
Single Mode........D
Back Up Navigation Mode........E

DSC-22_10-40 Controls and Indicators

DSC-22_10-40-05 Management of the Displays

General........A

DSC-22_10-40-10 MCDU

MCDU........A

DSC-22_10-40-20 FCU

FCU........A
FCU Philosophy........B
Speed/Mach Control Area........C
Lateral Control Area........D
AP-A/THR Control Area........E
Vertical Control Area........F

Continued on the following page

Continued from the previous page

DSC-22_10-40-30 Thrust Levers

Thrust Levers........A

DSC-22_10-40-40 Primary Flight Display

PFD........A

DSC-22_10-40-50 Navigation Display

ND........A
Arc Mode........B
Plan Mode........C
Rose Modes........D
Flight Plan Display Colors........E

DSC-22_10-40-60 Memo Display

Memo Display........A

DSC-22_10-50 Flight Envelope - Speeds Definition

DSC-22_10-50-10 General

General........A

DSC-22_10-50-20 Characteristic Speeds

Characteristic Speeds........A

DSC-22_10-50-30 Limit Speeds

Limit Speeds........A

DSC-22_10-50-40 Protection Speeds

Protection Speeds........A

DSC-22_10-50-50 Other Speeds

Other Speeds........A

FMGEC STANDARD

Ident.: DSC-22_10-10-00023784.0021001 / 28 NOV 19
Applicable to: LV-GKO, LV-GKP

The aircraft is equipped with FMS2 HONEYWELL P3 and FGE B9.

FMGEC STANDARD

Ident.: DSC-22_10-10-00023859.0024001 / 28 NOV 19
Applicable to: LV-KHT, LV-KHU

The aircraft is equipped with FMS2 HONEYWELL Release 1A P4 and FGE HJ1A.

FMGEC STANDARD

Ident.: DSC-22_10-10-00023831.0002001 / 28 NOV 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The aircraft is equipped with FMS2 HONEYWELL Release 2 P5A and FGE H3.

PREAMBLE

Ident.: DSC-22_10-10-00009929.0001001 / 18 AUG 10
Applicable to: ALL

This section gives a general description of the Auto Flight System and its functions:
- Architecture
- Function description
- Basic principle of systems:
  - Reversion
  - Protection
  - Managed and selected guidance modes.
- Mode information
- Display characteristics
- Operational principles
- Flight crew interface (MCDU pages)
- Degraded modes of operations.

DESCRIPTION

Ident.: DSC-22_10-10-00009933.0001001 / 18 AUG 10
Applicable to: ALL

The Flight Management Guidance and Envelope System (FMGES) contains the following units:
- Two Flight Management Guidance and Envelope Computers (FMGEC)
- Three Multipurpose Control and Display Units (MCDU)

- One Flight Control Unit (FCU)
- One Flight Management source selection device.

GENERAL PHILOSOPHY

Ident.: DSC-22_10-10-00009936.0001001 / 18 AUG 10
Applicable to: ALL

The Flight Management Guidance and Envelope System (FMGES) provides predictions of flight time, mileage, speed, economy profiles and altitude.
It reduces cockpit workload, improves efficiency, and eliminates many routine operations generally performed by the flight crew.

The Flight Management Guidance and Envelope System (FMGES) operates as follows:
- During cockpit preparation the flight crew uses the Multipurpose Control and Display Unit (MCDU) to insert a preplanned route from origin to destination. This route includes SID, EN ROUTE, WAYPOINTS, STAR, APPROACH, MISSED APPR, and ALTN route as available from the navigation database.
- Subsequently the system defines a vertical profile and a speed profile, taking into account ATC requirements and performance criteria.

Either FMGEC performs all operations, if one FMGEC fails.
The FMGES computes the aircraft position continually, using stored aircraft performance data and navigation data. Therefore it can steer the aircraft along a preplanned route and vertical and speed profiles. This type of guidance is said to be “managed”.
If the flight crew wants to modify any flight parameter (SPD, V/S, HDG, etc.) temporarily, they may do so by using the various Flight Control Unit (FCU) selectors. The FMGES then guides the aircraft to the target value of this parameter that they have selected. This type of guidance is said to be “selected”.

The two available types of guidance, then, are:
- Managed guidance guides the aircraft along the preplanned route and the vertical and speed/Mach profile (the FMGES computes the target values of the various flight parameters).
- Selected guidance guides the aircraft to the target values of the various flight parameters the flight crew selects by using the FCU selectors.

Selected guidance always has priority over managed guidance.

FLIGHT MANAGEMENT GUIDANCE AND ENVELOPE COMPUTER (FMGEC)

Ident.: DSC-22_10-10-00009937.0017001 / 05 MAR 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Each FMGEC is divided in four main parts:

- The Flight Management (FM) part controls the following functions:
  - Navigation and management of navigation radios
  - Flight planning and management
  - Performance prediction and optimization
  - Display management.
- The Flight Guidance (FG) part performs the following functions:
  - Autopilot (AP) command
  - Flight Director (FD) command
  - Autothrust (A/THR) command.
- The Flight Envelope (FE) part controls the following functions:
  - Computation of data for the flight envelope and speed functions
  - Monitoring of parameters used by FG and FE parts
  - Windshear and aft Center of Gravity (CG) detection
  - Computation of GW and CG information.
- The Fault Isolation and Detection System (FIDS) part performs the following functions:
  - Acquisition and concentration of maintenance data
  - Interface with the Central Maintenance Computer (CMC).

Each FMGEC has its own set of databases. The individual databases can be independently loaded into their respective FMGEC, or independently copied from one FMGEC to the other. Each FMGEC contains these main databases:

1. The Navigation database contains standard navigation data: Navaids, waypoints, airways, enroute information, holding patterns, airports, runways, procedures (SIDs, STARs, etc.), company routes, fuel policy, and alternates.
   The airline updates this part every 28 days, and is responsible for defining, acquiring, updating, loading, and using this data. The update operation takes 20 min to complete, or 5 min if crossloaded from the opposite FMGEC.
2. The Airline Modifiable Information (AMI), also decribed as the FM Airline Configuration file, contains:
   - Airline policy values: THR RED altitude, ACC altitude, EO ACC altitude, PERF factor, and IDLE factor.
   - Fuel policy values: Fuel for taxi, percentage of route reserve, maximum and minimum values of route reserve, etc.
   - AOC functions customization.
3. The Aircraft Performance Database includes the Engine model, Aerodynamic model, and Performance model. The airline cannot modify this database.

4. Each FMGEC contains element stored by the flight crew that enable them to generate 99 waypoints, 10 runways, 20 navaids and 5 routes.
5. The Magnetic Variation database.

FLIGHT MANAGEMENT GUIDANCE AND ENVELOPE COMPUTER (FMGEC)

Ident.: DSC-22_10-10-00009937.0003001 / 28 MAY 20
Applicable to: LV-GKO, LV-GKP

Each FMGEC is divided in four main parts:

- The Flight Management (FM) part controls the following functions:
  - Navigation and management of navigation radios
  - Flight planning and management
  - Performance prediction and optimization
  - Display management.
- The Flight Guidance (FG) part performs the following functions:
  - Autopilot (AP) command
  - Flight Director (FD) command
  - Autothrust (A/THR) command.
- The Flight Envelope (FE) part controls the following functions:
  - Computation of data for the flight envelope and speed functions
  - Monitoring of parameters used by FG and FE parts
  - Windshear and aft Center of Gravity (CG) detection
  - Computation of GW and CG information.
- The Fault Isolation and Detection System (FIDS) part performs the following functions:
  - Acquisition and concentration of maintenance data
  - Interface with the Central Maintenance Computer (CMC).

Each FMGEC has its own set of databases. The individual databases can be independently loaded into their respective FMGEC, or independently copied from one FMGEC to the other. Each FMGEC contains these main databases:

1. The Navigation database contains standard navigation data: Navaids, waypoints, airways, enroute information, holding patterns, airports, runways, procedures (SIDs, STARs, etc.), company routes, fuel policy, and alternates.

The airline updates this part every 28 days, and is responsible for defining, acquiring, updating, loading, and using this data. The update operation takes 20 min to complete, or 5 min if crossloaded from the opposite FMGEC.

2. The Airline Modifiable Information (AMI), also decribed as the FM Airline Configuration file, contains:
   - Airline policy values: THR RED altitude, ACC altitude, EO ACC altitude, PERF factor, and IDLE factor.
   - Fuel policy values: Fuel for taxi, percentage of route reserve, maximum and minimum values of route reserve, etc.
   - AOC functions customization.
3. The Aircraft Performance Database includes the Engine model, Aerodynamic model, and Performance model. The airline cannot modify this database.
4. Each FMGEC contains element stored by the flight crew that enable them to generate 20 waypoints, 10 runways, 20 navaids and 5 routes.
5. The Magnetic Variation database.

MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU)

Ident.: DSC-22_10-10-00009938.0001001 / 18 AUG 10
Applicable to: ALL

Three MCDUs are installed on the pedestal for flight crew loading and the display of data.
The use of the MCDU enables the flight crew to interface with the FMGEC via selection of a flight plan for lateral and vertical trajectories and speed profiles. The flight crew may also modify selected navigation or performance data and specific functions of Flight Management (revised flight plan, engine-out, secondary flight plan, etc.). It is also possible to display additional data from peripherals (Centralized Maintenance System (CMS), ARINC Communication Addressing and Reporting System (ACARS), Air Traffic Service Unit (ATSU)...). If the flight crew enters data in the MCDU that is not logical, or is beyond the capabilities of the aircraft, it is disregarded or it generates an advisory message.
The MCDUs enable backup navigation in the case of dual FM failure.

FLIGHT CONTROL UNIT (FCU)

Ident.: DSC-22_10-10-00009939.0001001 / 18 AUG 10
Applicable to: ALL

The FCU on the glareshield is the short-term interface between the flight crew and the FMGEC. The flight crew uses it to select any flight parameters, or to modify those selected on the MCDU. It is possible to engage or disengage autopilots and autothrust functions. It is possible to select different guidance modes in order to change various targets (speed, heading, track, altitude, flight path angle, vertical speed).

FM SOURCE SELECTOR

Ident.: DSC-22_10-10-00009940.0001001 / 18 AUG 10
Applicable to: ALL

This selector enables the flight crew to transfer the FMGEC data to the offside MCDU and EFIS display in the case of an FM failure.

OTHER FLIGHT CREW INTERFACES

Ident.: DSC-22_10-10-A-00009941.0001001 / 18 AUG 10
Applicable to: ALL

THRUST LEVERS

The thrust levers are the main interface between the Flight Management Guidance and Envelope Computer (FMGEC), the Full Authority Digital Engine Control System (FADEC), and the flight crew.

The thrust levers:
- Arm the autothrust at takeoff, when the flight crew selects FLX or TOGA
- Limit the maximum thrust by their position when autothrust is active
- Disconnect the autothrust system when the flight crew sets them to IDLE
- Command the thrust manually when the autothrust is not active
- Engage the common modes (takeoff or go-around) when the flight crew selects TOGA (or FLX for takeoff)
- Set the autothrust to ACTIVE mode, when they are between IDLE and CL detent (MCT in engine out).

Ident.: DSC-22_10-10-A-00009942.0001001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ELECTRONIC FLIGHT INSTRUMENTS (EFIS)

Two Primary Flight Displays (PFD) and Navigation Displays (ND) provide the flight crew with full-time flight guidance, navigation and system advisory information for all flight phases. There is an EFIS control panel at each end of the glareshield and it is used to control both Primary and Navigation Displays. This panel includes controls to select various modes within the PFD. A selector enables the barometric altimeter setting to be displayed on the PFD. It is possible to select various distance ranges on the ND, and two switches enable the display of either the left or right VOR/ADF bearing pointers on the ND.

Ident.: DSC-22_10-10-A-00009942.0003001 / 18 AUG 10
Applicable to: LV-KHT, LV-KHU

ELECTRONIC FLIGHT INSTRUMENTS (EFIS)

Two Primary Flight Displays (PFD) and Navigation Displays (ND) provide the flight crew with full-time flight guidance, navigation and system advisory information for all flight phases. There is an EFIS control panel at each end of the glareshield and it is used to control both Primary and Navigation Displays. This panel includes controls to select various modes within the PFD. A selector enables the barometric altimeter setting to be displayed on the PFD. It is possible to select various distance ranges on the ND, and two switches enable the display of either the left or right VOR bearing pointers on the ND.

Ident.: DSC-22_10-10-A-00009943.0001001 / 18 AUG 10
Applicable to: ALL

PRIMARY FLIGHT DISPLAYS

The PFDs combine several conventional flight instrument indications on one color display panel, for the centralized reference of flight data.

This centralized color display includes:
- Flight Director attitude guidance targets
- Armed and engaged modes
- Navigation and instrument approach information
- Altimeter setting
- Barometric altitude
- System messages.

Ident.: DSC-22_10-10-A-00009944.0001001 / 18 AUG 10
Applicable to: ALL

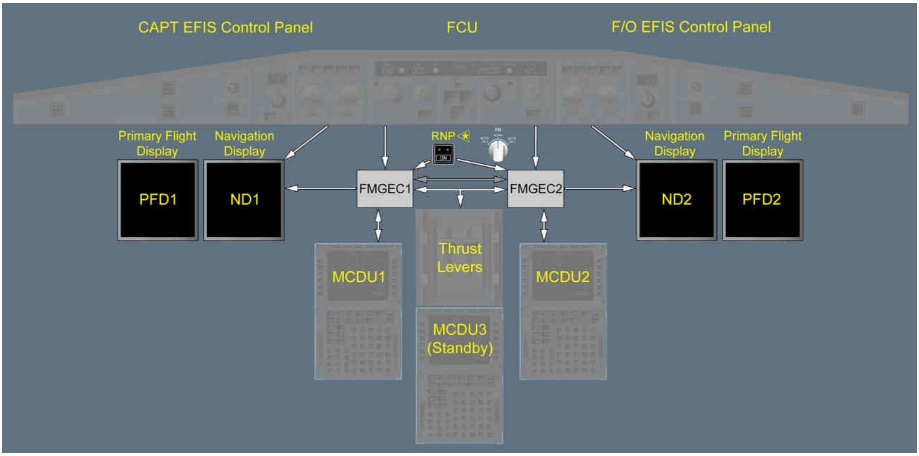
NAVIGATION DISPLAYS

The flight crew can select five different navigation compass displays:
- ARC (map mode)
- ROSE NAV (map mode)
- ROSE VOR
- ROSE LS
- PLAN.

Information displayed on these modes uses the position of the aircraft as a reference point for the flight plan navigation data (lateral and vertical information).

FLIGHT CREW INTERFACE WITH FMGEC

Ident.: DSC-22_10-10-00009946.0001001 / 05 MAR 19
Applicable to: ALL


CAPT EFIS Control Panel
FCU
F/O EFIS Control Panel
Primary Flight Display
Navigation Display
RNP
Navigation Display
Primary Flight Display
PFD1
ND1
FMGEC1
FMGEC2
ND2
PFD2
Thrust Levers
MCDU1
MCDU2
MCDU3 (Standby)

FAULT ISOLATION AND DETECTION SYSTEM

Ident.: DSC-22_10-10-00001408.0001001 / 05 APR 11
Applicable to: ALL

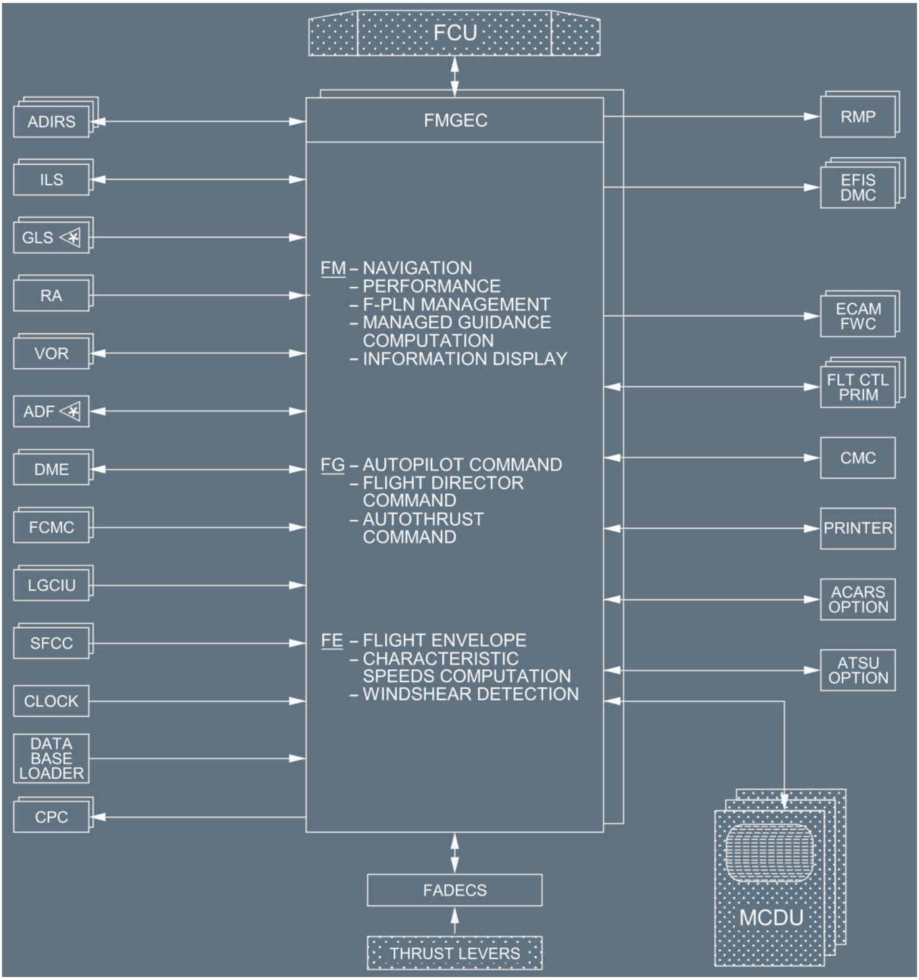
The Fault Isolation and Detection System (FIDS) is installed in FMGC 1. The system achieves the following functions :

- Detection and memorization of all internal and external failures
- Tests initiation

The FIDS serves as the system BITE (maintenance data concentration).
It is connected to the BITE's of the various AFS computers (FM, FG, FE, FCU, MCDU) and linked to the CMS.
Display and interrogation of FIDS function are done by selecting appropriate key on the MCDU page.

SYSTEM INTERFACE DIAGRAM

Ident.: DSC-22_10-20-00010434.0003001 / 12 FEB 13
Applicable to: ALL


FCU
FMGEC
ADIRS
ILS
GLS
RA
VOR
ADF
DME
FCMC
LGCIU
SFCC
CLOCK
DATA BASE LOADER
CPC
FM – NAVIGATION
– PERFORMANCE
– F-PLN MANAGEMENT
– MANAGED GUIDANCE COMPUTATION
– INFORMATION DISPLAY
FG – AUTOPILOT COMMAND
– FLIGHT DIRECTOR COMMAND
– AUTOTHRUST COMMAND
FE – FLIGHT ENVELOPE
– CHARACTERISTIC SPEEDS COMPUTATION
– WINDSHEAR DETECTION
RMP
EFIS DMC
ECAM FWC
FLT CTL PRIM
CMC
PRINTER
ACARS OPTION
ATSU OPTION
MCDU
FADECS
THRUST LEVERS

Intentionally left blank

GENERAL

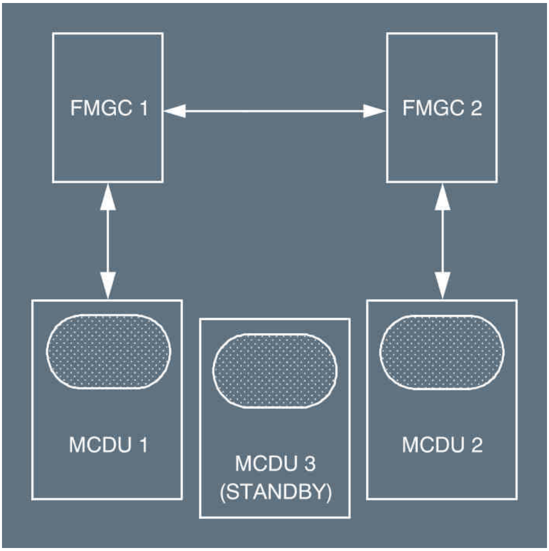
Ident.: DSC-22_10-30-00009947.0001001 / 18 AUG 10
Applicable to: ALL

The FMGES has four modes of operation:
- Dual mode (the normal mode)
- Independent mode. Each FMGEC being controlled by its associated MCDU
- Single mode (using one FMGEC only)
- Back-up navigation mode.

DUAL MODE

Ident.: DSC-22_10-30-00009948.0001001 / 19 DEC 12
Applicable to: ALL

This is the normal mode. The two FMGECs are synchronized: each performs its own computations and exchanges data with the other through a crosstalk bus.
One FMGEC is the master, the other the slave, so that some data in the slave FMGEC comes from the master.
All data inserted into any MCDU is transferred to both FMGECs and to all peripherals.

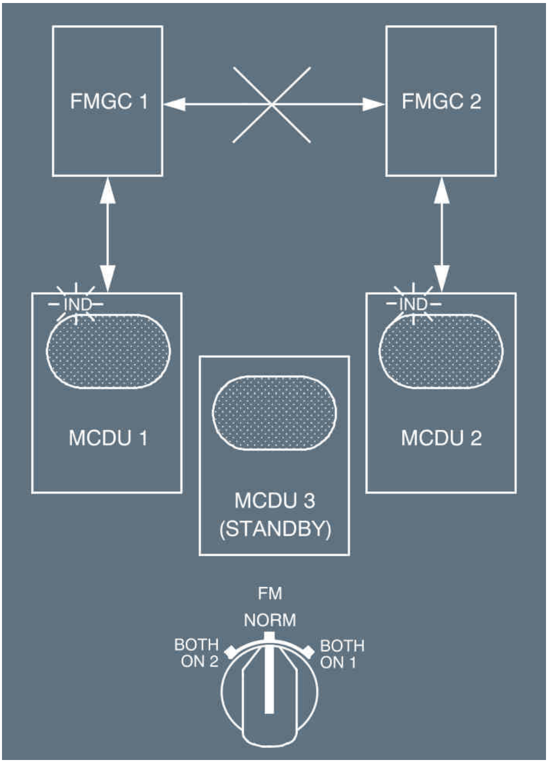


MASTER FMGEC LOGIC:

- If one autopilot (AP) is engaged, the related FMGEC is master:
  - It uses the onside FD for guidance
  - It controls the A/THR
  - It controls the FMA 1 and 2
- If two APs are engaged, FMGEC1 is master.
- If no AP is engaged and
  - The FD1 pb is on, then FMGEC1 is master.
  - The FD1 pb is off, and FD2 pb on then FMGEC2 is master.
- If no AP/FD is engaged, A/THR is controlled by FMGEC1.

INDEPENDENT MODE

Ident.: DSC-22_10-30-00009953.0003001 / 19 DEC 12
Applicable to: ALL


FMGC 1
FMGC 2
IND
IND
MCDU 1
MCDU 2
MCDU 3
(STANDBY)
FM
NORM
BOTH
ON 2
BOTH
ON 1

The system selects automatically this degraded mode under specific abnormal conditions (e.g. different database validity on both FMGECs). Each FMGEC works independently from the other and is linked to the peripherals on its owner side (“on side” peripheral) only.
While this is occuring, “INDEPENDENT OPERATION” message is displayed on both MCDUs scratchpads. The "IND" annunciator light illuminates amber on the top of the MCDU.
Each MCDU transmits data received from its onside FMGEC. It affects only the onside EFIS (Electronic Flight Instrument System) and RMP (Radio Management Panel).
On POS MONITOR pages and GPS MONITOR pages, FM and GPS position from the opposite FMGEC are not displayed.
On RAD NAV page and PROG page, navaids tuned on the opposite MCDU are not displayed. Corresponding fields are blank.

PROCEDURES ON GROUND

- **If each FMGEC is loaded with a different database,** the FMGES will only operate in independent mode only.

  CHECK the database number and validity.

  CROSSLOAD the database to restore the dual operation.

  Crossload function is available on ground only (in preflight or done phase), when an independent operation is detected.

PROCEDURES IN FLIGHT

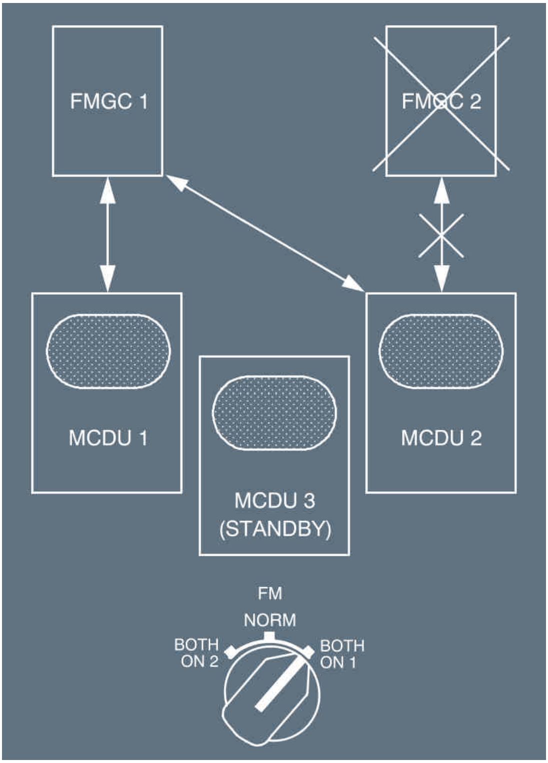
DO NOT SWITCH the navigation databases.
MAKE the same entries on both MCDUs to have both AP/FD similar orders.

Both FGs being valid, 2 APs may be engaged for CAT II or CAT III operations.

- **In the event of a go around and when the second AP is disconnected:**
  ENSURE that the FMGEC in command has correct flight plan orders and an updated nav database.

SINGLE MODE

Ident.: DSC-22_10-30-00009955.0001001 / 19 DEC 12
Applicable to: ALL



The system degrades to the single mode when one FMGEC has failed, and the flight crew has selected the FM source selector to the healthy FM.

While this is occurring:
- Corresponding ND displays "OFFSIDE FM CONTROL" amber message
- Both POS MONITOR pages display the same position (operative FMGEC position)
- Both FDs are driven by the same FMGEC
- Any entry on either MCDU is sent to the operative FMGEC.

PROCEDURES

- **If a transient failure triggers a single mode of operation:**

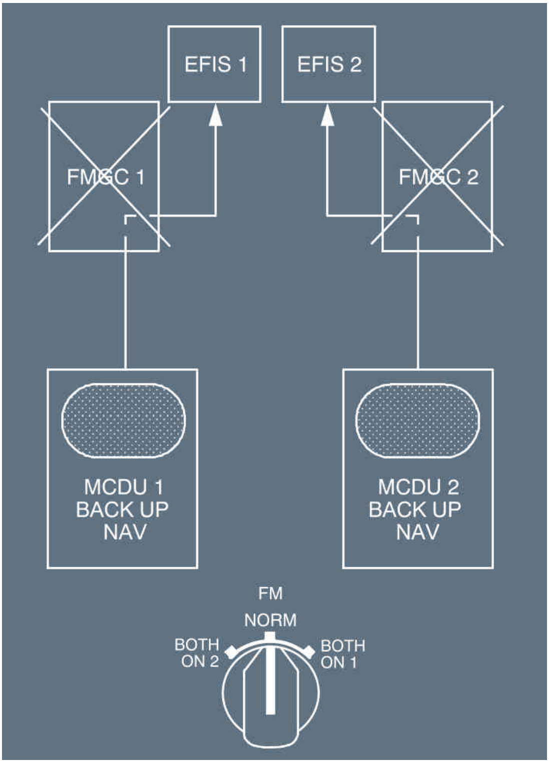
  DO NOT USE the MCDU(s) until the PLEASE WAIT message is suppressed.

  SET both NDs on the same range and mode to display the same information from the operative FMGEC.

  When convenient, RESET the failed FMGEC. (*Refer to DSC-22_20-90-10 Manual FMGEC Reset*).

BACK UP NAVIGATION MODE

Ident.: DSC-22_10-30-00009956.0001001 / 19 DEC 12
Applicable to: ALL


EFIS 1
EFIS 2
FMGC 1
FMGC 2
MCDU 1
BACK UP
NAV
MCDU 2
BACK UP
NAV
FM
NORM
BOTH
ON 2
BOTH
ON 1

The flight crew selects on the MCDU MENU page this degraded mode when both FMGECs have failed. They recover the navigation function through the MCDU and IRS.

The MCDU continuously memorizes the active flight plan, which was continuously downloaded from the FMGEC until it failed.

If both FMGECs fail, the back up navigation provides the following functions:
- Flight Planning
- Aircraft position using onside IRS or IRS 3
- F-PLN display on ND
- No AP/FD NAV mode
- Limited lateral revision
- F-PLN automatic sequencing.

Note: *MCDU 3 is not able to operate as back up navigation even when it replaces MCDU 1 or 2. The back up navigation mode is only accessible on the MCDU MENU page if the FM source selector is set to NORM position.*

GENERAL

Ident.: DSC-22_10-40-05-00009925.0001001 / 18 AUG 10
Applicable to: ALL

The flight management system displays navigation, performance and guidance information on the:
- Multipurpose Control and Display Unit (MCDU)
- Navigation Display (ND) of the Electronic Flight Instrument System (EFIS)
- Primary Flight Display (PFD) of the EFIS.

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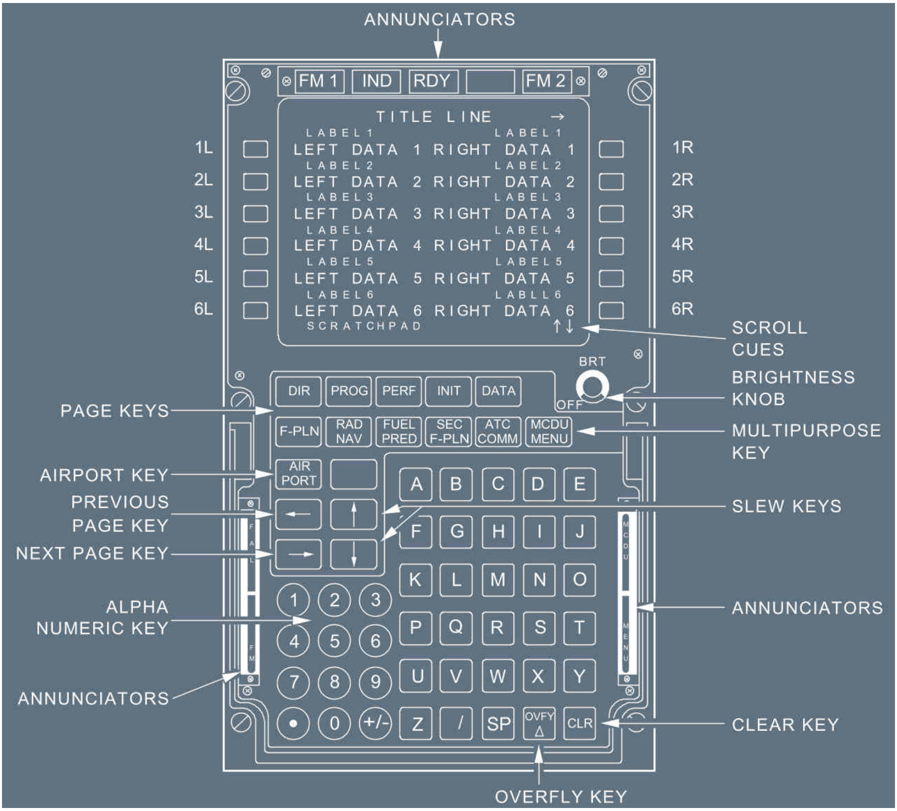
MCDU

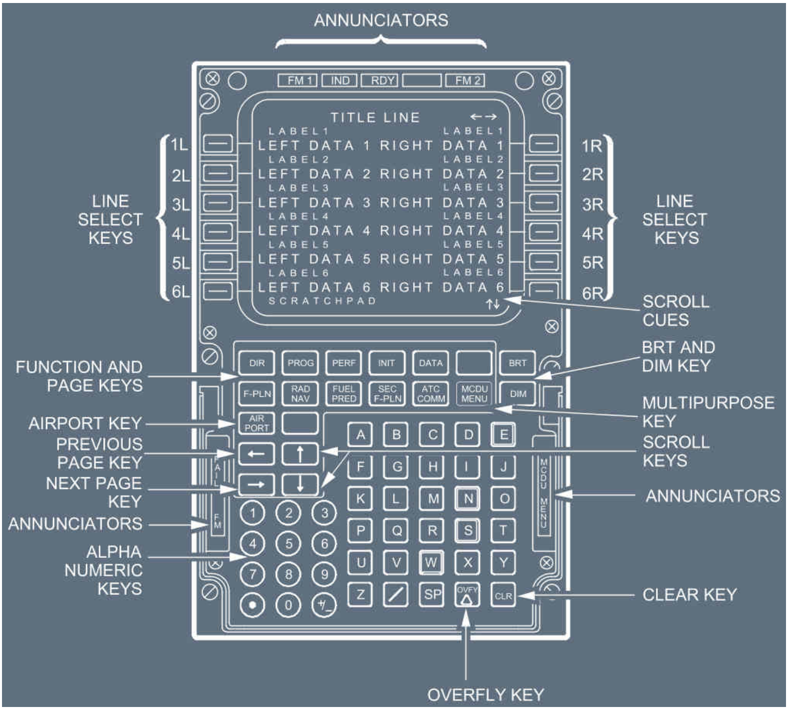
Ident.: DSC-22_10-40-10-A-00009957.0003001 / 21 NOV 11
Applicable to: LV-GKO, LV-GKP

MCDU INTERFACE


ANNUNCIATORS
FM 1
IND
RDY
FM 2
TITLE LINE →
LABEL 1
LEFT DATA 1 RIGHT DATA 1
LABEL 2
LEFT DATA 2 RIGHT DATA 2
LABEL 3
LEFT DATA 3 RIGHT DATA 3
LABEL 4
LEFT DATA 4 RIGHT DATA 4
LABEL 5
LEFT DATA 5 RIGHT DATA 5
LABEL 6
LEFT DATA 6 RIGHT DATA 6
SCRATCHPAD ↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SCROLL CUES
BRT
OFF
BRIGHTNESS KNOB
DIR
PROG
PERF
INIT
DATA
F-PLN
RAD NAV
FUEL PRED
SEC F-PLN
ATC COMM
MCDU MENU
AIR PORT
PAGE KEYS
MULTIPURPOSE KEY
AIRPORT KEY
PREVIOUS PAGE KEY
NEXT PAGE KEY
SLEW KEYS
ALPHA NUMERIC KEY
ANNUNCIATORS
ANNUNCIATORS
FAIL
FM
MCDU
MENU
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z / SP OVFY Δ CLR
1 2 3 4 5 6 7 8 9 • 0 +/-
CLEAR KEY
OVERFLY KEY

Ident.: DSC-22_10-40-10-A-00009957.0007001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MCDU INTERFACE


ANNUNCIATORS
FM 1
IND
RDY
FM 2
TITLE LINE
←→
LABEL1
LEFT DATA 1 RIGHT DATA 1
LABEL2
LEFT DATA 2 RIGHT DATA 2
LABEL3
LEFT DATA 3 RIGHT DATA 3
LABEL4
LEFT DATA 4 RIGHT DATA 4
LABEL5
LEFT DATA 5 RIGHT DATA 5
LABEL6
LEFT DATA 6 RIGHT DATA 6
SCRATCHPAD
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LINE SELECT KEYS
LINE SELECT KEYS
SCROLL CUES
BRT AND DIM KEY
FUNCTION AND PAGE KEYS
DIR
PROG
PERF
INIT
DATA
BRT
F-PLN
RAD NAV
FUEL PRED
SEC F-PLN
ATC COMM
MCDU MENU
DIM
AIR PORT
MULTIPURPOSE KEY
AIRPORT KEY
PREVIOUS PAGE KEY
NEXT PAGE KEY
SCROLL KEYS
FAIL
FM
MCDU MENU
ANNUNCIATORS
ANNUNCIATORS
ALPHA NUMERIC KEYS
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z / SP OVFY CLR
1 2 3
4 5 6
7 8 9
. 0 +/-
CLEAR KEY
OVERFLY KEY

Ident.: DSC-22_10-40-10-A-00009958.0001001 / 18 AUG 10
Applicable to: LV-GKO, LV-GKP

GENERAL

The Multipurpose Control and Display Unit (MCDU) is a cathode ray tube that generates 14 lines, of 24 characters each, with:

- A title that provides the name of the current page in large letters
- Six label lines: Each one describes the data displayed slightly below it (on the data field line)

- Six data field lines that display computed data or data inserted by the flight crew
- The scratchpad line displays:
  - Specific messages
  - Information that the flight crew enters via the number and the letter keys and that they can then move to one of the data fields.

Ident.: DSC-22_10-40-10-A-00009958.0003001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

The Multipurpose Control and Display Unit (MCDU) is a Liquid Crystal Display (LCD) with 14 lines, of 24 characters each, with:

- A title that provides the name of the current page in large letters
- Six label lines: Each one describes the data displayed slightly below it (on the data field line)
- Six data field lines that display computed data or data inserted by the flight crew
- The scratchpad line displays:
  - Specific messages
  - Information that the flight crew enters via the number and the letter keys and that they can then move to one of the data fields.

Ident.: DSC-22_10-40-10-A-00009959.0001001 / 18 AUG 10
Applicable to: ALL

LINE SELECT KEYS

There is a column of line select keys (LSKs) on each side of the screen.

The flight crew uses these keys to:

- Move a parameter they have entered in the scratchpad to the appropriate line on the main screen
- Call up a specific function page indicated by a prompt displayed on the adjacent line
- Call up lateral or vertical revision pages from the flight plan page.

Ident.: DSC-22_10-40-10-A-00009960.0001001 / 18 AUG 10
Applicable to: ALL

KEYBOARD

The keyboard includes:

- Function and Page keys — Call up functions and pages the flight crew uses for flight management functions and computations.

↑ ↓ (or SLEW) keys	Move a page up or down to display portions that are off the screen.
← → keys	Move to the next or previous page of a multi-page element. An arrow in the top right corner indicates that another page is available.
AIRPORT key	Calls up the flight plan page that contains the next airport along the current flight plan. Successive pushes on the key show the alternate airport, the origin airport (before takeoff), and the next airport again.

- Number and letter keys allow the flight crew to insert data in the scratchpad so that they can use a line select key to enter it in the main display.
- Three keys have special functions:

CLR (clear) key	Erases material (messages or inserted data) from the scratchpad or from certain areas of displayed pages.
OVFY (overfly) key	Allows the aircraft to overfly a selected waypoint.
SP (space) key	Allows to insert a space in specific messages.

Ident.: DSC-22_10-40-10-A-00009961.0001001 / 18 AUG 10
Applicable to: ALL

ANNUNCIATORS (ON THE SIDE OF THE KEYBOARD)

FAIL (amber)	Indicates that the Multipurpose Control and Display Unit (MCDU) has failed.
MCDU MENU (white)	Indicates that the flight crew should call up a peripheral linked to the MCDU (such as ACARS, ATSU or CMS).
FM (white)	Comes on while the flight crew is using the MCDU to display peripherals. This light tells the flight crew that the FMGEC has an important message to deliver. The flight crew accesses the message by pressing the MCDU MENU key and the line select key adjacent to the FMGEC prompt.

Ident.: DSC-22_10-40-10-A-00009968.0001001 / 18 AUG 10
Applicable to: LV-GKO, LV-GKP

ANNUNCIATORS (ON THE TOP OF THE KEYBOARD)

FM 1 and FM 2 (amber)	The onside FM is failed *Note:* - *The FM failure annunciator on MCDU 3 comes on only if MCDU 3 operates as a back up of MCDU 1 or 2* - *A MCDU has never both FM failure annunciators ON.*
IND (amber)	The onside FM detects an independent mode of operation while both FM are healthy.
RDY (green)	MCDU has passed its power up test after its BRT knob was turned to OFF.

Ident.: DSC-22_10-40-10-A-00009968.0005001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ANNUNCIATORS (ON THE TOP OF THE KEYBOARD)

FM 1 and FM 2 (amber)	The onside FM is failed *Note:* - *The FM failure annunciator on MCDU 3 comes on only if MCDU 3 operates as a back up of MCDU 1 or 2* - *A MCDU has never both FM failure annunciators ON.*
IND (amber)	The onside FM detects an independent mode of operation while both FM are healthy.
RDY (green)	MCDU has passed its power up test after it was turned to OFF using its DIM key.

Ident.: DSC-22_10-40-10-A-00009969.0001001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

BRT AND DIM KEYS

The flight crew can adjust the brightness of the MCDU with the BRT and DIM keys.
In addition, the BRT key is used to power up the MCDU, and the DIM key is used to shut down the MCDU.

Note: *In case of MCDU 1 or 2 failure, its DIM key has to be switched off to allow the MCDU 3 connection to the corresponding FMGEC.*

Ident.: DSC-22_10-40-10-A-00009970.0001001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

BRT knob

Controls the light intensity of the entire MCDU and is used to shut down the MCDU when set to off.

Note: *In case of MCDU 1 or 2 failure, its BRT knob has to be switched off to allow the MCDU 3 connection to the corresponding FMGEC.*

Ident.: DSC-22_10-40-10-A-00009971.0001001 / 18 AUG 10
Applicable to: ALL

DATA ENTRY

The flight crew enters data by typing it into the scratchpad on the MCDU. Next, pressing the line select key (LSK) will load the data from the scratchpad into the desired field. An error message displays if the data are out of range or not formatted correctly. To correct data, the flight crew may clear the message with the clear (CLR) key and then retype the message into the scratchpad. Pressing the CLR key when the scratchpad is empty displays “CLR”. To clear data from a field, select CLR from the scratchpad to the data field to be cleared.

Ident.: DSC-22_10-40-10-A-00009972.0001001 / 18 AUG 10
Applicable to: ALL

MCDU ENTRY FORMAT

The flight crew enters information into the MCDU at the bottom line of the scratchpad. When data has lead zeros, they may be omitted if desired. For example a three-digit wind direction of 060 may be typed as 60. The display will still show 060. To enter an altitude below 1 000 ft, the lead zero must be added as 0400 for 400 ft. This differentiates the altitude from a flight level.
To enter a double data entry such a speed/altitude, the separating slash must be used. If entering only the first part of a double entry, omit the slash. To enter only the second part of a double entry, a leading slash must be used i.e. /0400.

Ident.: DSC-22_10-40-10-A-00009973.0001001 / 18 AUG 10
Applicable to: ALL

MESSAGES

The scratchpad displays various messages for flight crew information. Theses messages are prioritized by importance to the flight crew as either amber or white.

Amber messages are:
- Navigation messages
- Data entry messagesh
- EFIS repeat messages.

Amber messages are categorized into two types:

- Type 1 message that is a direct result of a flight crew action. Type 1 messages are displayed immediately in the scratchpad ahead of other messages.
- Type 2 messages inform the flight crew of a given situation or request a specific action. Stored in “last in”, “first out” message queue that holds maximum of 5 messages.
  Type 2 messages are displayed in the scratchpad only if there are no Type 1 messages or other data and will remain until all the messages have been viewed and cleared with the CLR key.

White messages are advisory only.

Ident.: DSC-22_10-40-10-A-00009974.0001001 / 18 AUG 10
Applicable to: ALL

CHARACTERS

Small and large fonts are displayed according to the following rules:

- The title line and the scratchpad are displayed in large font
- Datafields are usually displayed in large font
- Label lines are displayed in small font
- Flight crew entries and modifiable data are displayed in large font
- Defaulted/computed and non modifiable data are displayed in small font.

Ident.: DSC-22_10-40-10-A-00009975.0001001 / 18 AUG 10
Applicable to: ALL

COLORS

DATA	MCDU COLOR
TITLES, COMMENTS, <, >, ↑ ↓, ← →, DASHES, MINOR MESSAGES	WHITE
- MODIFIABLE DATA - SELECTABLE DATA - BRACKETS	BLUE
- NON MODIFIABLE DATA - ACTIVE DATA	GREEN
- MANDATORY DATA (BOXES) - FLIGHT CREW ACTION REQUIRED - IMPORTANT MESSAGES - MISSED CONSTRAINT	AMBER
- CONSTRAINTS - MAX ALTITUDE	MAGENTA
PRIMARY F-PLN	GREEN WAYPOINTS, WHITE LEGS

Continued on the following page

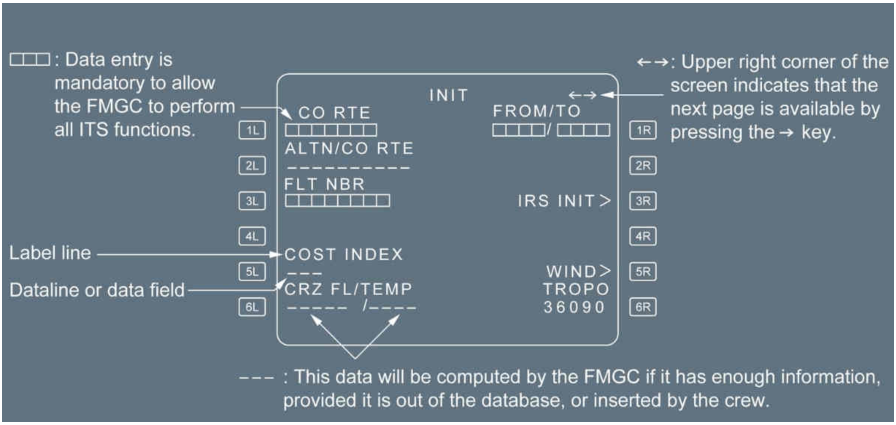
Continued from the previous page

DATA	MCDU COLOR
TEMPORARY F-PLN	YELLOW WAYPOINTS, WHITE LEGS
SECONDARY F-PLN	WHITE WAYPOINTS AND LEGS
MISSED APPROACH (not active)	BLUE WAYPOINTS, WHITE LEGS
ALTERNATE F-PLN (not active)	BLUE WAYPOINTS, WHITE LEGS
OFFSET	GREEN WAYPOINTS, WHITE LEGS, OFST IS DISPLAYED IN THE TITLE OF THE F-PLN PAGE
TUNED NAVAID	BLUE
"TO" WAYPOINT AND DESTINATION	WHITE

Ident.: DSC-22_10-40-10-A-00009976.0003001 / 16 NOV 11
Applicable to: ALL

SCREEN PROMPTS

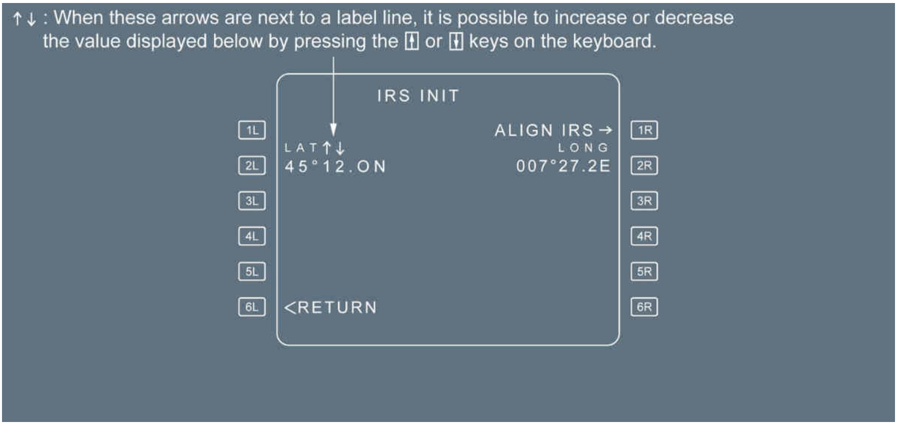
Screen Prompts


□□□ : Data entry is mandatory to allow the FMGC to perform all ITS functions.
←→: Upper right corner of the screen indicates that the next page is available by pressing the → key.
INIT
CO RTE
□□□□□□□□□
ALTN/CO RTE

FLT NBR
□□□□□□□□
COST INDEX

CRZ FL/TEMP
----- /----
FROM/TO
←→
□□□□/□□□□
IRS INIT>
WIND>
TROPO
36090
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
Label line
Dataline or data field
--- : This data will be computed by the FMGC if it has enough information, provided it is out of the database, or inserted by the crew.

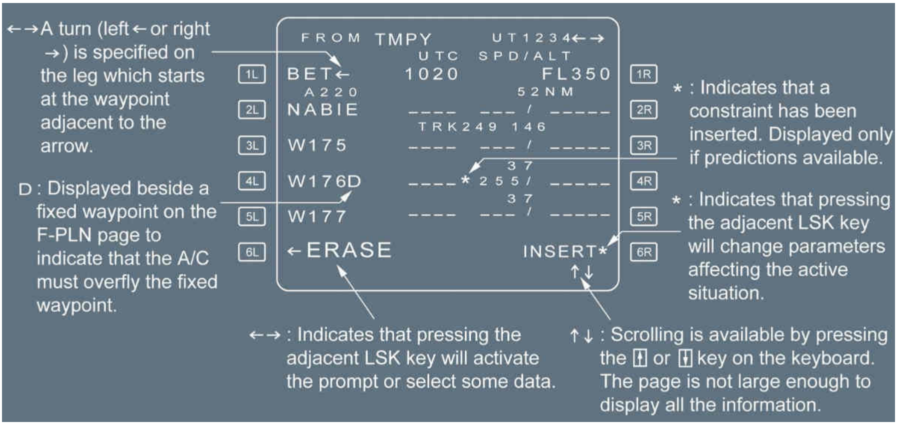
Screen Prompts



↑↓ : When these arrows are next to a label line, it is possible to increase or decrease the value displayed below by pressing the ⇧ or ⇩ keys on the keyboard.

IRS INIT
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
ALIGN IRS→
LAT↑↓
LONG
45°12.0N
007°27.2E
<RETURN

Screen Prompts



←→A turn (left ← or right →) is specified on the leg which starts at the waypoint adjacent to the arrow.

D : Displayed beside a fixed waypoint on the F-PLN page to indicate that the A/C must overfly the fixed waypoint.

⋆ : Indicates that a constraint has been inserted. Displayed only if predictions available.

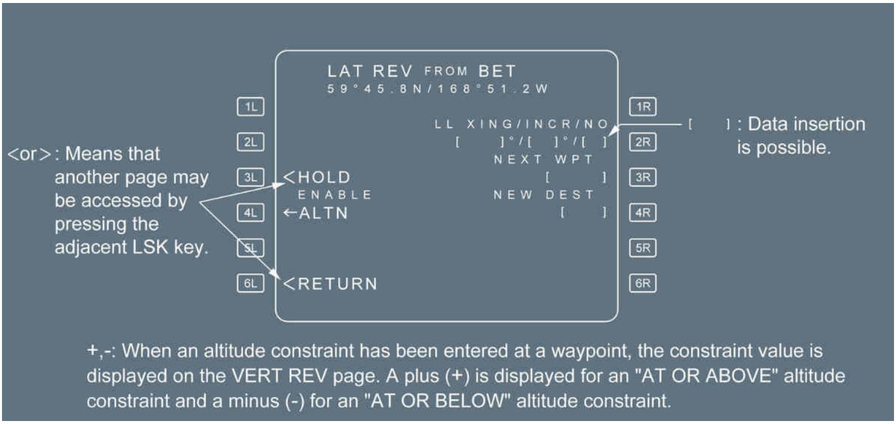
⋆ : Indicates that pressing the adjacent LSK key will change parameters affecting the active situation.

←→ : Indicates that pressing the adjacent LSK key will activate the prompt or select some data.

↑↓ : Scrolling is available by pressing the ⇧ or ⇩ key on the keyboard. The page is not large enough to display all the information.

FROM TMPY
UT1234←→
UTC
SPD/ALT
BET←
1020
FL350
A220
52NM
NABIE
---- ---/ -----
TRK249 146
W175
---- ---/ -----
37
W176D
----* 255/ -----
37
W177
---- ---/ -----
←ERASE
INSERT*
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Screen Prompts



<or>: Means that another page may be accessed by pressing the adjacent LSK key.

[ ]: Data insertion is possible.

+,-: When an altitude constraint has been entered at a waypoint, the constraint value is displayed on the VERT REV page. A plus (+) is displayed for an "AT OR ABOVE" altitude constraint and a minus (-) for an "AT OR BELOW" altitude constraint.

Ident.: DSC-22_10-40-10-A-00009977.0023001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

MCDU FUNCTION KEYS

The Multipurpose Control and Display Unit function keys enable the flight crew to quickly call up MCDU pages.
The following summarizes the purpose of each key:

DIR	Calls up the DIR TO page and enables the flight crew to proceed directly from the present position to any waypoint entered manually or selected in the active flight plan.
PROG	Calls up the progress page corresponding to the phase of the active flight plan that is in progress. This page displays navigation information and active data such as the optimum and maximum recommended cruise flight levels. It allows the flight crew to update the FMGES position, and to get a bearing and distance to any location.
PERF	Calls up the performance pages, which display the optimum speed or Mach number for each phase. The flight crew can amend these pages. The first page to be displayed is the one corresponding to the current flight phase (except for preflight and done phases). The flight crew can then use the appropriate 6L or 6R key to call up pages corresponding to future flight phases.

INIT	Calls up the flight plan initialization page (INIT A), which also gives access to the INIT FUEL PRED page and IRS INIT page. The flight crew uses the INIT pages to initialize flight management for the flight. The flight crew primarily uses the INIT A page to insert the flight plan. The flight crew uses the IRS INIT page to align the inertial reference system. The flight crew uses the INIT FUEL PRED page to insert aircraft weight, FOB, CG and other fuel requirements. The FMGES uses this data to compute predictions and fuel planning parameters. The flight crew can access the INIT A page, for flight plan initialization, only in the preflight phase. In flight, they can only modify the alternate flight plan. IRS INIT page is accessed via the "IRS INIT" prompt on the INIT A page. In the flight phase, it is only accessible for information purposes. The INIT FUEL PRED page (not accessible after engine start) is called up by pressing the "→" (NEXT PAGE) key.
DATA	Calls up the DATA INDEX page. This provides the flight crew access to various reference pages that display aircraft position, aircraft status, runways, waypoints, NAVAIDs, routes and data stored by the flight crew.
F-PLN	Calls up the flight plan A and B pages, that contain a leg-by-leg description of the active primary flight plan. The flight crew can use the scroll keys to review the entire active flight plan. They can make all lateral and vertical revisions to the flight plan via these pages, by using the left keys for lateral revision and the right keys for vertical revision.
RAD NAV	Calls up the RADIO NAV page. This page displays the radio NAVAIDs that are tuned automatically or manually via the FMGEC.
FUEL PRED	Calls up the fuel prediction page. When the engines start, this page displays the predicted remaining fuel at the destination and the alternate, and fuel management data.
SEC F-PLN	Calls up the index page for the secondary flight plan. The flight crew can use this page to call up the secondary flight plan and all the functions related to it (copying, deleting, reviewing, activating, and the INIT and PERF pages).
ATC COMM	Calls up the ATC applications (if activated).
MCDU MENU	Calls up the MCDU MENU page, that displays the subsystems currently addressed via the MCDU. The key next to the name of a subsystem enables the flight crew to select that subsystem. When the MCDU MENU annunciator lights up, the flight crew should press the MCDU MENU key. The menu displays [REQ] next to the name of the subsystem that requires attention.

AIRPORT	Calls up the flight plan page that includes the next airport along the current flight plan. The first push of the AIRPORT key displays the destination. Successive pushes show the alternate, the origin, and the destination again.

Ident.: DSC-22_10-40-10-A-00009977.0011001 / 18 AUG 10

Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

MCDU FUNCTION KEYS

The Multipurpose Control and Display Unit function keys enable the flight crew to quickly call up MCDU pages.
The following summarizes the purpose of each key:

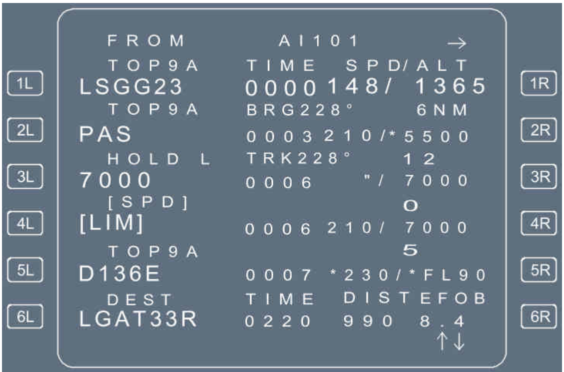
DIR	Calls up the DIR TO page and enables the flight crew to proceed directly from the present position to any waypoint entered manually or selected in the active flight plan.
PROG	Calls up the progress page corresponding to the phase of the active flight plan that is in progress. This page displays navigation information and active data such as the optimum and maximum recommended cruise flight levels. It allows the flight crew to update the FMGES position, and to get a bearing and distance to any location.
PERF	Calls up the performance pages, which display the optimum speed or Mach number for each phase. The flight crew can amend these pages. The first page to be displayed is the one corresponding to the current flight phase (except for preflight and done phases). The flight crew can then use the appropriate 6L or 6R key to call up pages corresponding to future flight phases.
INIT	Calls up the flight plan initialization (INIT) A page, which also gives access to the B page and IRS INIT page. The flight crew uses the INIT pages to initialize Flight Management for the flight. The flight crew primarily uses the INIT A page to insert the flight plan. The flight crew uses the IRS INIT page to align the inertial reference system. The flight crew uses the INIT B page to insert aircraft weight, Fuel on Board, CG, and other fuel requirements. The FMGES uses this data to compute predictions and fuel planning parameters. The flight crew can access the INIT A page, for Flight Plan initialization, only in the preflight phase. In flight, they can only modify the Alternate Flight Plan. IRS INIT page is accessed via the "IRS INIT" prompt on the INIT A page. In the flight phase, it is only accessible for information purposes. The INIT B page (not accessible after engine start) is called up by pressing the “← →” (NEXT PAGE) key.

DATA	Calls up the data index page. This provides the flight crew access to various reference pages that display aircraft position, aircraft status, runways, waypoints, navaids, routes and data stored by the flight crew.
F-PLN	Calls up the flight plan A and B pages, that contain a leg-by-leg description of the active primary flight plan. The flight crew can use the scroll keys to review the entire active flight plan. They can make all lateral and vertical revisions to the flight plan via these pages, by using the left keys for lateral revision and the right keys for vertical revision.
RAD NAV	Calls up the RADIO NAV page. This page displays the radio navaids that are tuned automatically or manually via the FMGEC.
FUEL PRED	Calls up the fuel prediction page. When the engines start, this page displays the predicted remaining fuel at the destination and the alternate, and fuel management data.
SEC F-PLN	Calls up the index page for the secondary flight plan. The flight crew can use this page to call up the secondary flight plan and all the functions related to it (copying, deleting, reviewing, activating, and the INIT and PERF pages).
ATC COMM	Calls up the ATC applications (if activated).
MCDU MENU	Calls up the MCDU MENU page, that displays the subsystems currently addressed via the MCDU. The key next to the name of a subsystem enables the flight crew to select that subsystem. When the MCDU MENU annunciator lights up, the flight crew should press the MCDU MENU key. The menu displays [REQ] next to the name of the subsystem that requires attention.
AIRPORT	Calls up the flight plan page that includes the next airport along the current flight plan. The first push of the AIRPORT key displays the destination. Successive pushes show the alternate, the origin, and the destination again.

Ident.: DSC-22_10-40-10-A-00009978.0001001 / 18 AUG 10
Applicable to: ALL

MCDU DISPLAY

The MCDUs display:
- Position and accuracy information
- Tuned navaids
- Lateral and vertical flight plans (waypoints, pseudo waypoints, constraints)
- Predictions (SPD, TIME, ALT, WIND)
- Fuel predictions and fuel management information (estimated fuel on board, extra fuel)
- Performance data.



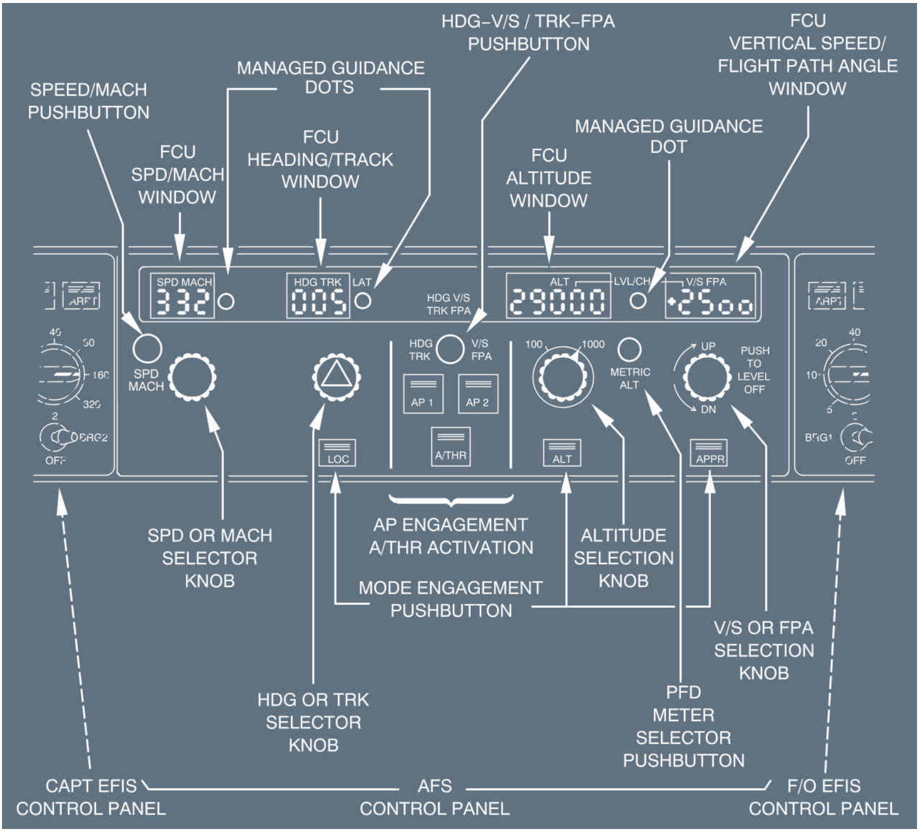
```
FROM           AI101          →
 TOP9A         TIME  SPD/ALT
LSGG23         0000 148/ 1365
 TOP9A         BRG228°    6NM
PAS            0003 210/*5500
 HOLD L        TRK228°    12
7000           0006    "/ 7000
 [SPD]                    O
[LIM]          0006 210/ 7000
 TOP9A                    5
D136E          0007 *230/*FL90
 DEST          TIME  DIST EFOB
LGAT33R        0220  990  8.4
                          ↑↓
```

F-PLN page

FCU

Ident.: DSC-22_10-40-20-00010437.0002001 / 01 OCT 12
Applicable to: ALL

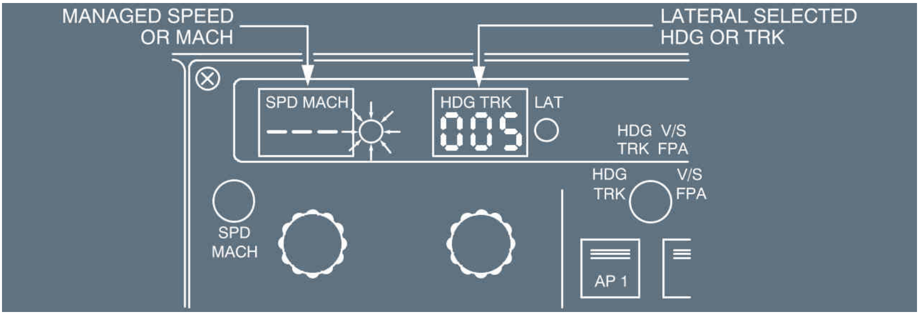
The Flight Control Unit (FCU) is located on the glareshield and is constituted of three control panels: One for the automatic flight controls and two for the Electronic Flight Instrument System (EFIS).
The FCU has two channels, each of which can independently command the central panel. If one channel fails, the other channel can control all the functions.


HDG-V/S / TRK-FPA PUSHBUTTON
FCU VERTICAL SPEED/ FLIGHT PATH ANGLE WINDOW
MANAGED GUIDANCE DOTS
SPEED/MACH PUSHBUTTON
MANAGED GUIDANCE DOT
FCU SPD/MACH WINDOW
FCU HEADING/TRACK WINDOW
FCU ALTITUDE WINDOW
SPD MACH
332
HDG TRK
005
LAT
HDG V/S
TRK FPA
ALT
29000
LVL/CH
V/S FPA
+25oo
40
80
160
320
2
BRG2
OFF
ARPT
SPD
MACH
HDG
TRK
V/S
FPA
AP 1
AP 2
A/THR
100
1000
METRIC
ALT
UP
DN
PUSH TO LEVEL OFF
LOC
ALT
APPR
20
10
5
BRG1
SPD OR MACH SELECTOR KNOB
AP ENGAGEMENT A/THR ACTIVATION
ALTITUDE SELECTION KNOB
MODE ENGAGEMENT PUSHBUTTON
V/S OR FPA SELECTION KNOB
HDG OR TRK SELECTOR KNOB
PFD METER SELECTOR PUSHBUTTON
CAPT EFIS CONTROL PANEL
AFS CONTROL PANEL
F/O EFIS CONTROL PANEL

FCU PHILOSOPHY

Ident.: DSC-22_10-40-20-00010438.0001001 / 01 OCT 12
Applicable to: ALL

The flight crew can use two types of guidance to control the aircraft in auto flight. The Flight Management Guidance and Envelope System (FMGES) manages one type. The other uses target quantities, manually entered by the flight crew.
When the aircraft uses target quantities from the FMGES (managed guidance), the FCU windows display dashes and the white dots next to those windows light up. When the aircraft uses target quantities that the flight crew enters (selected guidance), the windows display the selected numbers and the white dots do not light up.



Note: *The altitude window always displays an altitude that the flight crew selects (never dashes).*

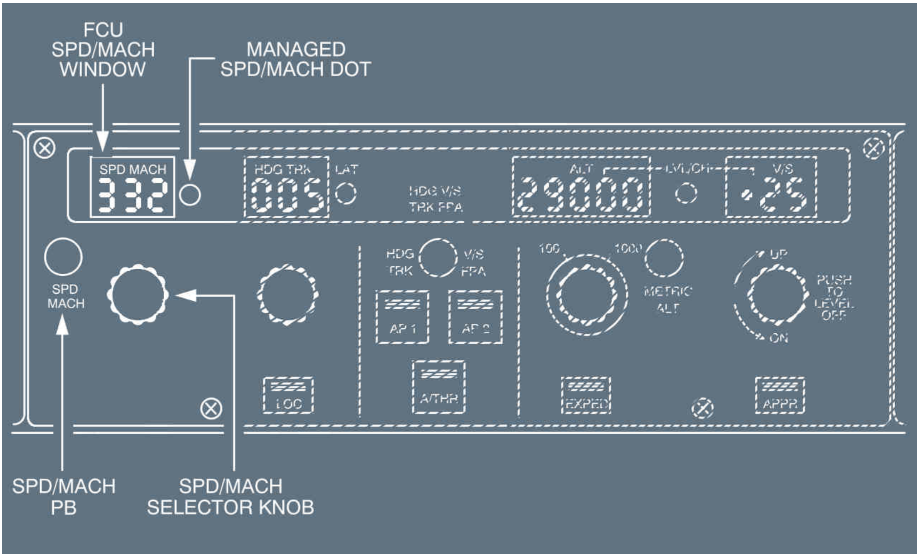
The FCU has four knobs:
- SPD-MACH
- HDG-TRK
- ALT
- V/S-FPA.

It is possible to rotate, push in and pull-out the knobs:
- In order to arm or engage managed guidance for a mode, the flight crew pushes in the associated knob. If, for example, they push in the HDG knob, this engages or arms the NAV mode.
- In order to engage a selected guidance mode, the flight crew turns the knob to set the desired value, then pulls the knob out to engage the mode with its target value that is equal to the selected value.

Note: *In managed guidance (lateral, vertical guidance or managed speed), the corresponding window is dashed. If the flight crew turns and does not pull a knob, it displays a value that is the sum of the current target and the turn action value. The value remains displayed 45 s before the dashes reappear. This rule does not apply to the ALT knob/window.*

SPEED/MACH CONTROL AREA

Ident.: DSC-22_10-40-20-00010439.0001001 / 19 DEC 12
Applicable to: ALL


FCU SPD/MACH WINDOW
MANAGED SPD/MACH DOT
SPD MACH
332
HDG TRK
LAT
005
HDG V/S
TRK FPA
ALT
LVL/CH
V/S
29000
-25
SPD MACH
HDG
TRK
V/S
FPA
AP 1
AP 2
LOC
A/THR
100
1000
METRIC ALT
EXPED
UP
PUSH TO LEVEL OFF
ON
APPR
SPD/MACH PB
SPD/MACH SELECTOR KNOB

SPD/MACH knob

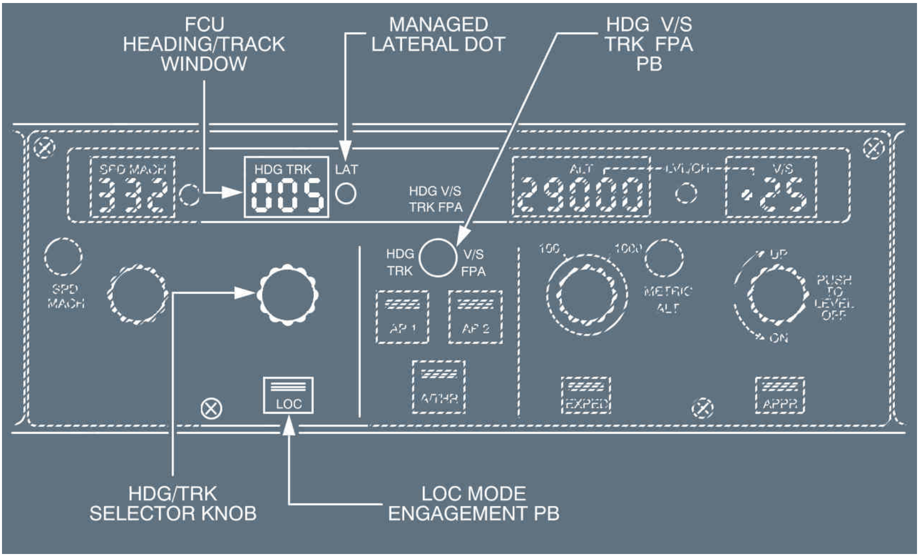
Display range : Between 100 and 399 kt for speed, between 0.10 and 0.99 for Mach number.
One rotation of the knob corresponds to approximately 30 kt , or M 0.3.

SPD/MACH pb

Press this pushbutton to change the SPD target to the corresponding MACH target and vice versa.

LATERAL CONTROL AREA

Ident.: DSC-22_10-40-20-00010440.0001001 / 19 DEC 12
Applicable to: ALL


FCU HEADING/TRACK WINDOW
MANAGED LATERAL DOT
HDG V/S TRK FPA PB
SPD MACH
332
HDG TRK
005
LAT
HDG V/S
TRK FPA
ALT
29000
LVL/CH
V/S
-25
SPD MACH
HDG TRK
V/S FPA
AP 1
AP 2
A/THR
100
1000
METRIC ALT
UP
PUSH TO LEVEL OFF
ON
LOC
EXPED
APPR
HDG/TRK SELECTOR KNOB
LOC MODE ENGAGEMENT PB

HDG/TRK knob

Display range : between 0 ° and 359 °.
One rotation of the knob corresponds to 30 ° (1 ° per click).

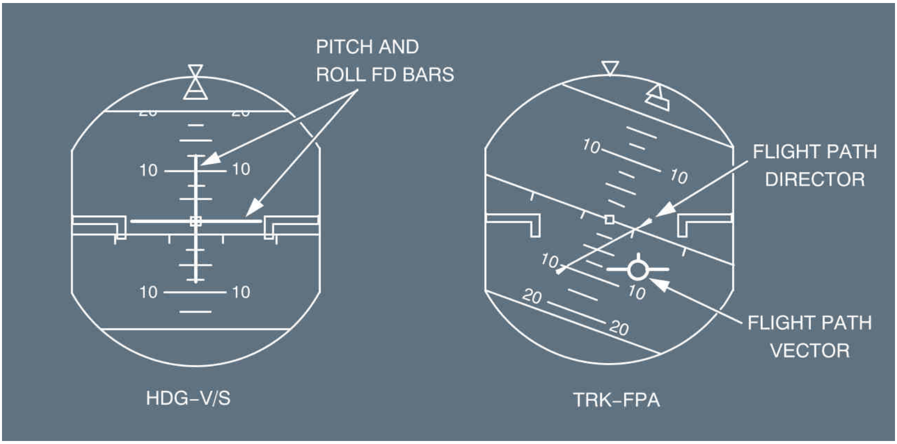
LOC pb

Press this pushbutton to arm, engage, or disengage the LOC mode.

HDG V/S - TRK FPA pb

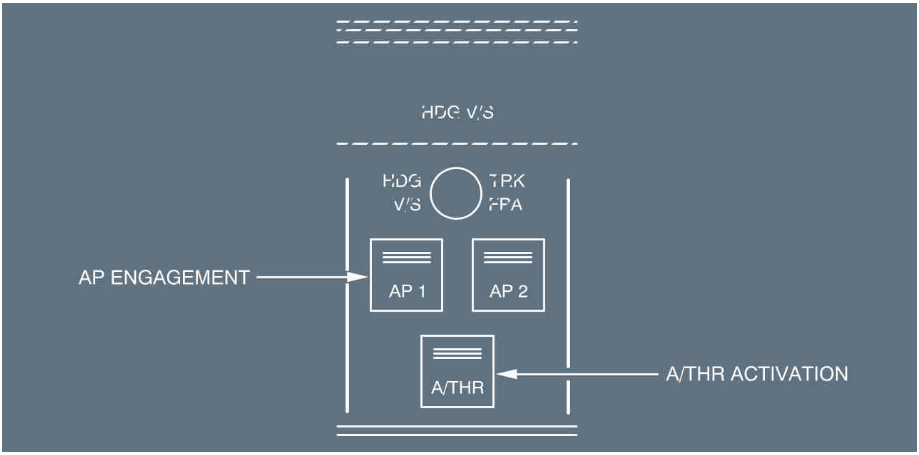
The flight crew uses this pushbutton to select HDG (associated with V/S) or TRK (associated with FPA). Pushing it:

- Displays the Flight Path Vector (FPV) on the Primary Flight Display (PFD) or deletes it.
- On the PFD, changes the FD crossbar display (with the aircraft attitude as its reference) to the aircraft Flight Path Director (with the flight path vector as its reference) and vice versa.
- Changes heading reference into track reference in the HDG/TRK window and vice versa.
- Changes vertical speed reference target into flight path angle reference target in the V/S-FPA window and vice versa.


PITCH AND
ROLL FD BARS
10
10
10
10
HDG–V/S
FLIGHT PATH
DIRECTOR
10
10
10
10
20
20
FLIGHT PATH
VECTOR
TRK–FPA

AP-A/THR CONTROL AREA

Ident.: DSC-22_10-40-20-00010441.0001001 / 14 MAY 12
Applicable to: ALL


HDG V/S
HDG
V/S
TRK
FPA
AP ENGAGEMENT
AP 1
AP 2
A/THR
A/THR ACTIVATION

AP1 pb AND AP2 pb

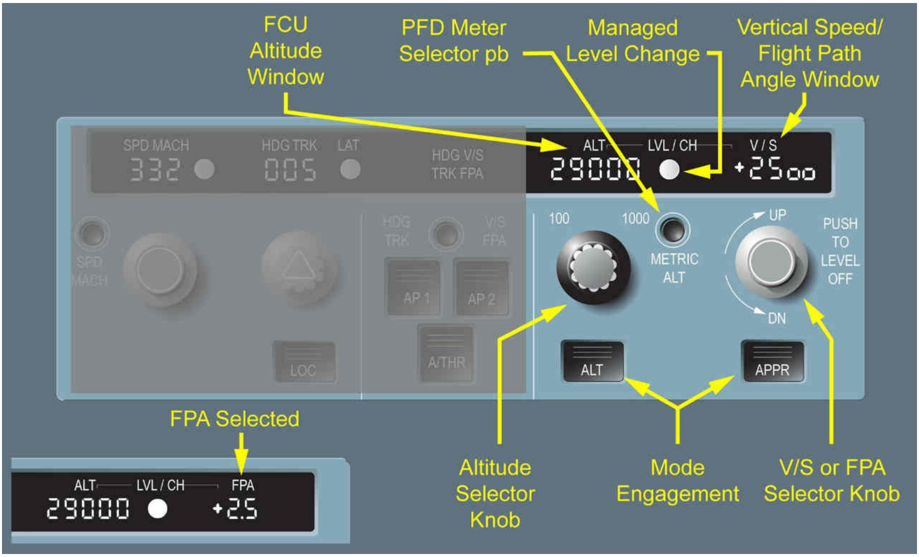
The flight crew uses these pushbuttons to engage or disengage the autopilots. The buttons illuminate green when the autopilot is engaged.

A/THR pb

The flight crew uses this pushbutton to arm, activate, or disconnect the autothrust (A/THR). This button illuminates green if the A/THR is armed or active.

VERTICAL CONTROL AREA

Ident.: DSC-22_10-40-20-00010442.0004001 / 05 MAY 22
Applicable to: ALL


FCU Altitude Window
PFD Meter Selector pb
Managed Level Change
Vertical Speed/ Flight Path Angle Window
SPD MACH
332
HDG TRK
LAT
005
HDG V/S
TRK FPA
ALT
LVL / CH
V / S
29000
+25oo
SPD
MACH
HDG TRK
V/S FPA
AP 1
AP 2
A/THR
LOC
100
1000
METRIC ALT
UP
DN
PUSH TO LEVEL OFF
ALT
APPR
FPA Selected
ALT
LVL / CH
FPA
29000
+2.5
Altitude Selector Knob
Mode Engagement
V/S or FPA Selector Knob

The FCU altitude window always displays a target value selected by the flight crew. It never displays dashes.

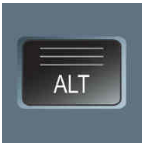
ALTITUDE Selector knob

When turned, sets the target altitude in the FCU window.

Display range: 100 to 49 000 ft
- The outer knob has two positions: 100 and 1000
- The inner knob sets the altitude in the FCU window, in increments of 100 or 1 000 ft, depending on the position of the outer knob.

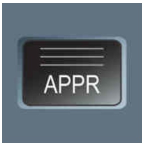
MODE ENGAGEMENT

ALT pb



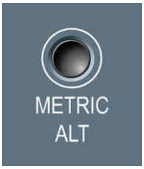
When pushed, commands an immediate level-off.

APPR pb



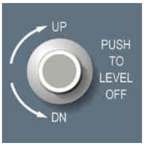
When pushed, arms, disarms, engages, or disengages the approach modes:
- LOC and G/S modes if an ILS/GLS ◁ approach is selected in the active F-PLN
- APP NAV-FINAL modes, if a non precision approach is selected in the active F-PLN.

PFD METER Selector pb



Displays the target altitude (either the FCU-selected altitude, or the FM altitude constraint) and the current altitude in meters on the PFD.

V/S or FPA Selector knob



When turned, if in V/S or FPA mode, selects a vertical speed or flight path angle target. If not in V/S or FPA mode (V/S / FPA window is dashed), preselects a vertical speed or flight path angle target. When the V/S or FPA mode engages (flight crew action or mode reversion), this preselected value becomes the target.
A push on the HDG V/S - TRK FPA pb allows to change the display between V/S or FPA.

Note: *If the V/S or FPA mode is not engaged within 45 s after preselection, the preselected value is cancelled and the dashes reappear.*

Range (V/S) : – 6 000 to + 6 000 ft/min
2 clicks = 100 ft/min
If the flight crew turns the knob slowly, each click equals 100 ft/min

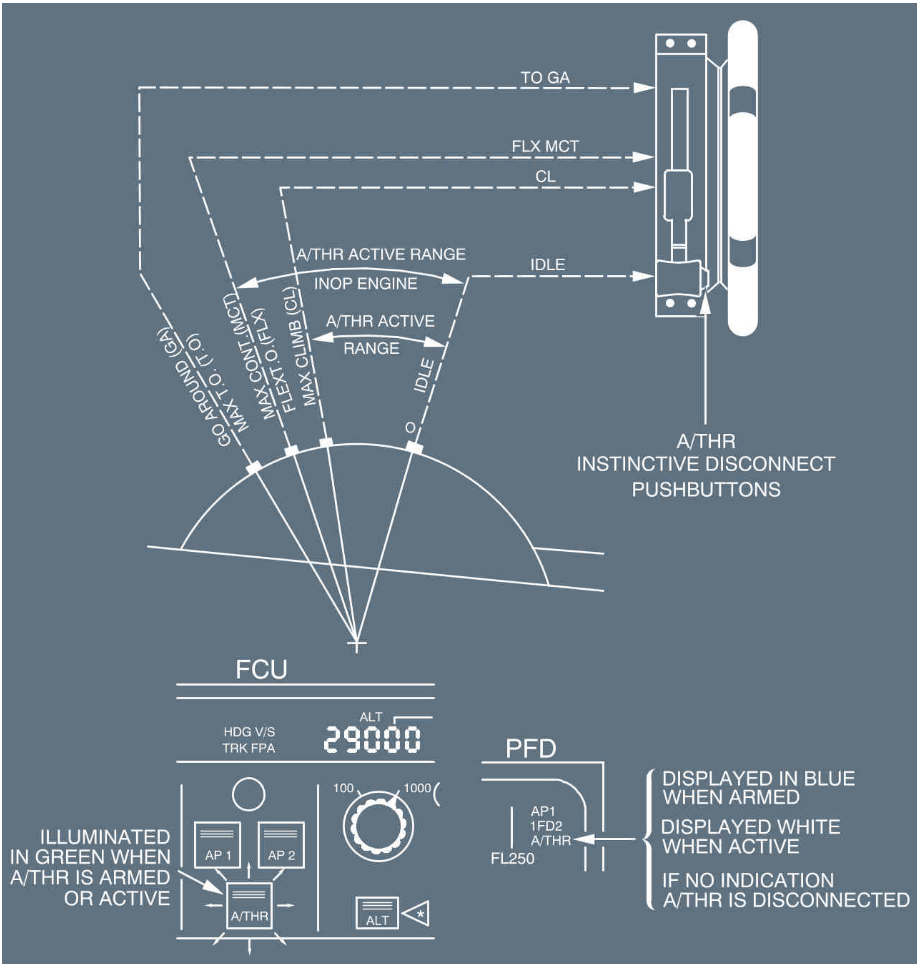
Range (FPA)	:	– 9.9 ° to + 9.9 ° 1 click = 0.1 °

One rotation of the knob corresponds to 32 clicks. One complete rotation sets:
FPA = 3.2 °
V/S = 1 600 ft/min

When the flight crew pushes the V/S knob or FPA knob, the system commands an immediate level-off by engaging the V/S or FPA mode with a target of zero. If the flight crew then turns the knob to set a new value for V/S or FPA, the aircraft changes flight path accordingly.

THRUST LEVERS

Ident.: DSC-22_10-40-30-00009928.0001001 / 14 MAY 12
Applicable to: ALL


TO GA
FLX MCT
CL
IDLE
A/THR ACTIVE RANGE
INOP ENGINE
A/THR ACTIVE
RANGE
GO AROUND (GA)
MAX T.O. (T.O.)
MAX CONT.(MCT)
FLEXT.O.(FLX)
MAX CLIMB (CL)
IDLE
O
A/THR
INSTINCTIVE DISCONNECT
PUSHBUTTONS
FCU
HDG V/S
TRK FPA
ALT
29000
100
1000
AP 1
AP 2
A/THR
ALT
ILLUMINATED
IN GREEN WHEN
A/THR IS ARMED
OR ACTIVE
PFD
AP1
1FD2
A/THR
FL250
DISPLAYED IN BLUE
WHEN ARMED
DISPLAYED WHITE
WHEN ACTIVE
IF NO INDICATION
A/THR IS DISCONNECTED

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PFD

Ident.: DSC-22_10-40-40-00009962.0001001 / 05 MAR 19
Applicable to: ALL

The FMGES generates the following information to the PFD:
- Armed and Engaged modes on the FMA
- FMGES guidance targets on the SPD, ALT and HDG scales
- Vertical deviation from descent profile on the ALT scale
- Approach trajectory deviations
- Flight crew awareness messages.

For all details, *Refer to DSC-31_40 Indications on PFD*.

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ND

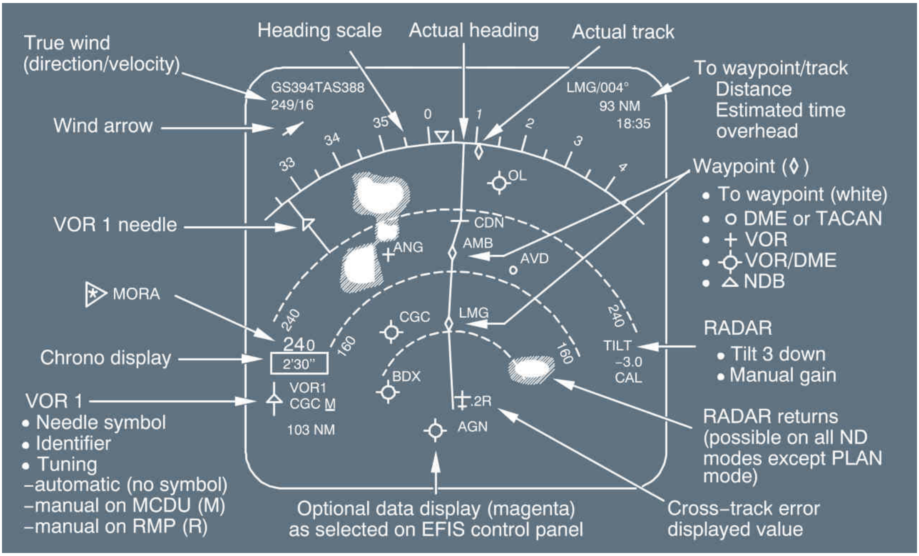
Ident.: DSC-22_10-40-50-00009930.0001001 / 18 AUG 10
Applicable to: ALL

The FMGES generates the following information, displayed on the EFIS Navigation Displays:

- Aircraft position
- Flight plans (active, secondary, temporary, and dashed)
- Lateral deviation from primary flight plan
- Pseudo waypoints along the flight plan
- Raw data from tuned navaids
- Wind information
- Various options, depending on what the flight crew selects on the EFIS control panel:
  - Waypoints, navaids, NDBs, airports, constraints
  - Type of approach selected
  - Messages.

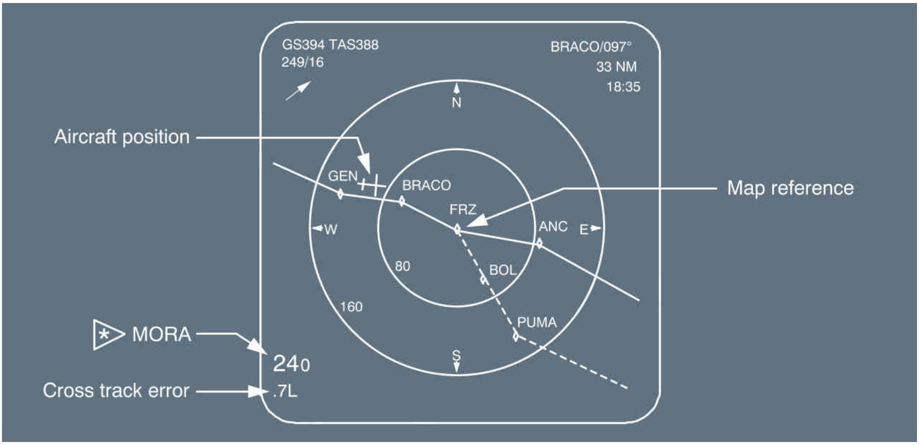
ARC MODE

Ident.: DSC-22_10-40-50-00009931.0001001 / 01 OCT 12
Applicable to: ALL


True wind
(direction/velocity)
Heading scale
Actual heading
Actual track
GS394TAS388
249/16
LMG/004°
93 NM
18:35
To waypoint/track
Distance
Estimated time
overhead
Wind arrow
35
0
1
2
34
3
33
4
OL
Waypoint (◊)
• To waypoint (white)
• o DME or TACAN
• + VOR
• VOR/DME
• △ NDB
VOR 1 needle
CDN
AMB
ANG
AVD
MORA
240
160
CGC
LMG
RADAR
• Tilt 3 down
• Manual gain
Chrono display
240
2'30"
TILT
−3.0
CAL
BDX
VOR 1
• Needle symbol
• Identifier
• Tuning
−automatic (no symbol)
−manual on MCDU (M)
−manual on RMP (R)
VOR1
CGC M
103 NM
.2R
AGN
RADAR returns
(possible on all ND
modes except PLAN
mode)
Optional data display (magenta)
as selected on EFIS control panel
Cross−track error
displayed value

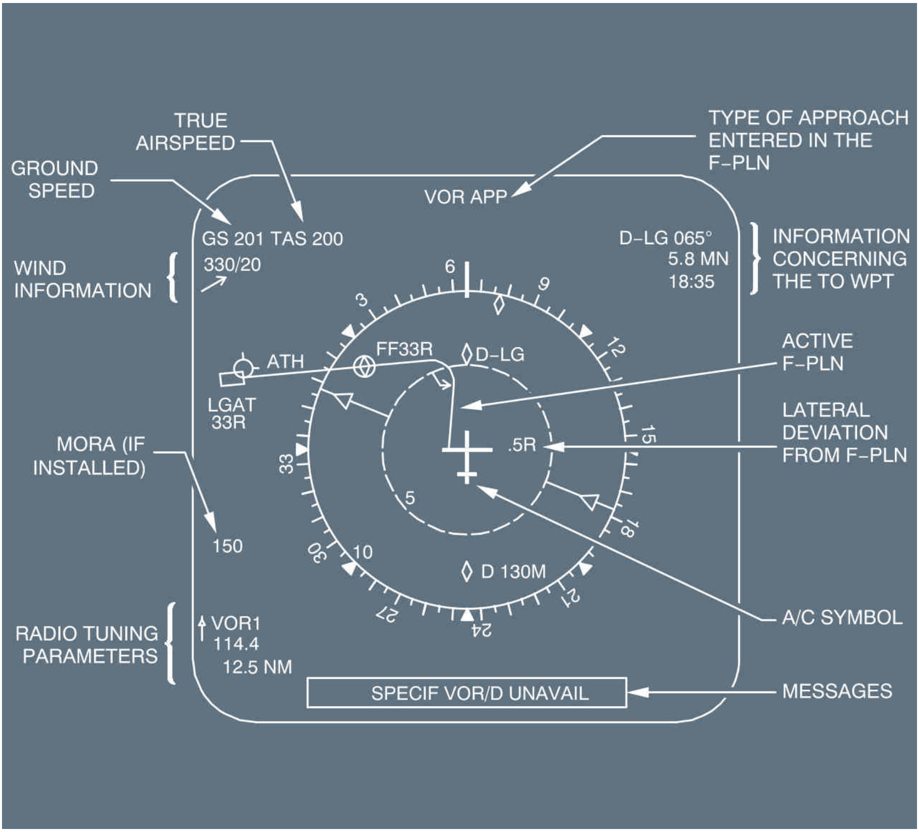
PLAN MODE

Ident.: DSC-22_10-40-50-00009932.0001001 / 01 OCT 12
Applicable to: ALL


GS394 TAS388
249/16
BRACO/097°
33 NM
18:35
N
Aircraft position
GEN
BRACO
FRZ
Map reference
W
ANC
E
80
BOL
160
PUMA
MORA
S
240
Cross track error
.7L

ROSE MODES

Ident.: DSC-22_10-40-50-00009934.0001001 / 19 DEC 12
Applicable to: ALL


TRUE AIRSPEED
GROUND SPEED
TYPE OF APPROACH ENTERED IN THE F–PLN
VOR APP
GS 201 TAS 200
330/20
WIND INFORMATION
D–LG 065°
5.8 MN
18:35
INFORMATION CONCERNING THE TO WPT
6
9
3
12
ACTIVE F–PLN
ATH
FF33R
D–LG
LGAT
33R
LATERAL DEVIATION FROM F–PLN
15
.5R
33
MORA (IF INSTALLED)
5
18
150
30
10
D 130M
21
27
24
A/C SYMBOL
RADIO TUNING PARAMETERS
VOR1
114.4
12.5 NM
SPECIF VOR/D UNAVAIL
MESSAGES

FLIGHT PLAN DISPLAY COLORS

Ident.: DSC-22_10-40-50-00009935.0001001 / 18 AUG 10
Applicable to: ALL

F-PLN	**Color**
Primary flight plan	- Managed mode: Steady green - Selected mode: Dashed green
Track line	Steady green
Alternate flight plan	Dashed blue
Missed approach	Steady blue
Offset flight plan	Steady green (Original flight plan: Dashed green)
Temporary flight plan	Dashed yellow
Engine-out SID (not inserted)	Steady yellow
Secondary flight plan	Steady dimmed white
Abeam/Radial	Dashed blue

MEMO DISPLAY

Ident.: DSC-22_10-40-60-00017160.0001001 / 21 MAR 16
Applicable to: ALL

FM SWTG : This memo appears in green, when the FM selector is on the BOTH ON 1 or the BOTH ON 2 position.

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GENERAL

Ident.: DSC-22_10-50-10-00020242.0001001 / 17 MAR 17

Applicable to: ALL

This section shows the symbology and definition of speeds.
Source of computation is also given when applicable.

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CHARACTERISTIC SPEEDS

Ident.: DSC-22_10-50-20-00020243.0001001 / 03 DEC 19
Applicable to: ALL

The characteristic speeds displayed on the PFD are computed by the FE (Flight Envelope). VLS (of normal landing configuration: CONF 3 or FULL), F, S and Green Dot speeds are also displayed on the MCDU TAKEOFF and/or APPR, GO AROUND pages.
These values are computed by the FMGC.
Computations made by FE and FMGC are based on the gross weight information transmitted by the FCMC (Fuel Control and Monitoring Computer).

VS : Stalling speed.
Not displayed.
For a conventional aircraft, the reference stall speed, VSmin, is based on a load factor that is less than 1 g. This gives a stall speed that is lower than the stall speed at 1 g. All operating speeds are expressed as functions of this speed. (For example, VREF = 1.3 VSmin).
Because the A330 has a low-speed protection feature (alpha limit) that the flight crew cannot override, the airworthiness authorities have reconsidered the definition of stall speed for this aircraft.
All the operating speeds must be referenced to a speed that can be demonstrated by flight test. This speed is designated VS1 g.

Airworthiness authorities have agreed that a factor of 0.94 represents the relationship between VS1 g for A330 and VSmin for conventional aircraft types.
As a result the authorities allow the A330 to use the following factors:
V2 min = 1.2 × 0.94 VS1 g = 1.13 VS1 g
VREF = 1.3 × 0.94 VS1 g = 1.23 VS1 g

These speeds are identical to those that the conventional 94 % rule would have defined for this aircraft. The A330 has exactly the same maneuver margin that a conventional aircraft would have at its reference speeds.
The FCOM uses VS for VS1 g.

VLS : Lowest Selectable speed.

Represented by the top of an amber strip along the airspeed scale on the PFD.

It is equal to:
- 1.13 VS, at takeoff
- 1.18 VS, when the flaps are retracted
- 1.23 VS, when in clean configuration. (It remains at this value until landing).

VLS is corrected for Mach effect to maintain a 0.3 g buffet margin.
In addition, VLS is increased when the speedbrakes are extended.

The VMCG/VMCA/VMCL is taken into account for VLS computation as follows:
- At takeoff, until retraction of one step of flaps, VLS is equal to or greater than the lowest of:
  - V2/1.05, or
  - 1.05 VMCA maximum certified.
- In all the other phases, it is equal to or greater than VMCL.

F :
- At takeoff or go-around: F is the minimum recommended speed at which the flaps may be retracted from CONF 3 to CONF 1+F or from CONF 2 to CONF 1+F.
- During approach: F is the target speed, when the aircraft configuration is CONF 2 or CONF 3.

Represented by “F” on the PFD airspeed scale.
At takeoff, it is equal to about 1.18 VS of CONF 1 + F, and is limited to a minimum of VMCL + 5 kt.
In approach, when the aircraft is in CONF 2, the takeoff value is increased by 14 %. It is limited to a minimum of VMCL + 15 kt and to a maximum of VFE CONF 3 – 2 kt.
Then, when the aircraft is in CONF 3, the takeoff value is increased by 4 %. It is limited to a minimum of VMCL +10 kt and to a maximum of VFE CONF FULL – 2 kt.

S :
- At takeoff or go-around: S is the minimum recommended speed at which the slats may be retracted from CONF 1+F to CONF 0 or from CONF 1 to CONF 0.
- During approach: S is the target speed, when the aircraft configuration is CONF 1.

Represented by “S” on the PFD airspeed scale.
Equal to 1.21 VS of clean configuration.
In approach, S is limited to a maximum of VFE CONF 1* - 2 kt.

0 : Green dot speed.
Engine-out operating speed in clean configuration.
(Best lift-to-drag ratio speed).
Corresponds also to the final takeoff speed.
Represented by a green dot on the PFD scale.

With all engines running:
- Below 20 000 ft equal to 0.6 × weight (metric tons) +107 kt
- Above 20 000 ft, add 1 kt per 1 000 ft

With at least one engine-out, subtract 10 kt, in the above situations.

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LIMIT SPEEDS

Ident.: DSC-22_10-50-30-00020244.0001001 / 17 MAR 17
Applicable to: ALL

VA : Maximum design maneuvering speed. This corresponds to the maximum structural speed permitted for full control deflection, if alternate or direct law is active.

VMCG : Minimum speed, on the ground during takeoff, at which the aircraft can be controlled by the use of primary flight controls only, after a sudden failure of the critical engine, the other engines remaining at takeoff power.

VMCA : Minimum control speed in flight at which the aircraft can be controlled with a maximum bank of 5 °, if one engine fails, the other engine remaining at takeoff power (takeoff flap setting, gear retracted).

VMCL : Minimum control speed in flight at which the aircraft can be controlled with a maximum bank of 5 °, if one engine fails, the other engine remaining at takeoff power (approach flap setting).

VFE : Maximum speed for each flap configuration.

VLE : Maximum speed with landing gear extended.

VLO : Maximum speed for landing gear operation.

VMO : Maximum speed.

VFE NEXT: Maximum speed for the next (further extended) flap lever position.

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PROTECTION SPEEDS

Ident.: DSC-22_10-50-40-00020245.0001001 / 17 MAR 17
Applicable to: ALL

Vα PROT, Vα MAX and VSW are computed by the PRIM, based on aerodynamic data.

Vα PROT:	Angle-of-attack protection speed. Corresponds to the angle-of-attack at which the angle-of-attack protection becomes active. Represented by the top of a black and amber strip along the PFD speed scale, in normal law.
Vα MAX :	Maximum angle-of-attack speed. Corresponds to the maximum angle-of-attack that may be reached in pitch normal law. Represented by the top of a red strip along the PFD speed scale, in normal law.
VSW :	Stall warning speed. Represented by a red and black strip along the speed scale when the flight control normal law is inoperative.
VMAX :	Represented by the bottom of a red and black strip along the speed scale. Determined by the FE according to the aircraft configuration. It is equal to VMO (or speed corresponding to MMO), VLE or VFE.

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OTHER SPEEDS

Ident.: DSC-22_10-50-50-00020246.0001001 / 05 DEC 17
Applicable to: ALL

V1 : The highest speed, during takeoff, at which the flight crew has a choice between continuing the takeoff or stopping the aircraft.
Represented by “1” on the airspeed scale (or the V1 value when it is off the airspeed scale).
Inserted manually through the MCDU by the crew.
Displayed on the MCDU TAKEOFF page.

VR : The speed at which the pilot rotates in order to reach V2 at an altitude of 35 ft at the latest after an engine failure.
Inserted manually through the MCDU by the crew.
Displayed on the MCDU TAKEOFF page.

V2 : Takeoff safety speed that the aircraft attains at the latest at an altitude of 35 ft with one engine failed and maintains during the second segment of the takeoff.
Represented by the SPEED SELECT symbol on the speed scale.
Minimum value equal to 1.13 VS for the corresponding configuration.
Inserted manually through the MCDU by the crew.
Displayed on the MCDU TAKEOFF page.

VREF : Reference speed used for normal final approach.
Equal to 1.23 × VS of configuration FULL.
Displayed on the MCDU APPR page if landing is planned in CONF FULL (VLS CONF FULL).

VAPP : Final approach speed.
Displayed on MCDU APPR page.
Calculated by the FMGCs.
Represents: VAPP = VLS + wind correction.
The wind correction is limited to a minimum of 5 kt and a maximum of 15 kt.
The flight crew may modify VAPP through the MCDU.

- During autoland or when A/THR is on or in case of ice accretion, or gusty crosswind greater than 20 kt, VAPP must not be lower than VLS +5 kt.

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AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT MANAGEMENT

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DSC-22_20-10 General

General............A

DSC-22_20-20 Navigation

DSC-22_20-20-05 General

Navigation............A

DSC-22_20-20-10 Position Computation

General............A
MIX IRS Position............B
GPS Position............C
Radio Position............D
FM Position............E
Position Monitor............F
Takeoff Update............G
Navigation Modes............H

DSC-22_20-20-20 Evaluation of Position Accuracy

General............A
Estimated Position Uncertainty............B
FM/GPS Position Disagreement............C

DSC-22_20-20-30 Radio Navigation Tuning

General............A
Architecture............B
VOR............C
DME............D
ADF............E
ILS/MLS............F
Selection of Navaids on MCDU Pages............G
Manual Tuning............H
Navaid Identification............I

DSC-22_20-20-40 Alignment of Inertial Reference System

Alignment of Inertial Reference System............A
IR in ATT MODE: HDG SET............B
Average Drift Computation............C
Polar Navigation............D

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DSC-22_20-30-05 General

Flight Planning........A

DSC-22_20-30-10 Lateral Functions

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Manual Legs........B
Flight Plan Construction........C
Flight Plan Capacity........D
Lateral Revisions........E

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GENERAL........A
TEMPORARY F-PLN (TMPY)........B
Inserting an Airway with "Via"........C
Inserting a Waypoint........D
Fix Info........E
INSERTING A NEW DESTINATION........F
Holding Pattern........G
Offset........H
Alternate Function........I
ENABLE ALTN........J
DIR Key (Direct-TO-Function)........K
OVFY (OVERFLY) KEY........L
POSITION UPDATE AT........M
UPDATE AT........N

DSC-22_20-30-20 Vertical Functions

DSC-22_20-30-20-05 General

General........A
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Vertical Revision........D
Vertical Constraints (Speed, Altitude, Time)........E

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Constant Mach Segment....D

DSC-22_20-40 Performance

DSC-22_20-40-10 Optimization

General....A
Optimization.... B

DSC-22_20-40-20 Cost Index (CI)

Cost Index (CI).... A

DSC-22_20-40-30 Predictions

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Predictions for the Primary Flight Plan.... B
Computation of Predictions.... C
Predictions Displayed on the Navigation Display.... D
Predictions Displayed on the MCDU....E
Type of Predictions.... F
Examples of MCDU Predictions....G
Constraint Symbols (Star).... H
Vertical Deviation.... I
Operation Rules Concerning Predictions....J
Other Computations....K
Return-to-Trajectory Assumptions....L
Introduction to PERF and IDLE Factors....M
PERF Factor....N
IDLE Factor.... O
Procedure to Modify the PERF and IDLE Factors....P

DSC-22_20-45 Takeoff Surveillance and Monitoring

DSC-22_20-45-10 Takeoff Surveillance Function

Takeoff Surveillance Function.... A
Associated Alerts and Messages.... B

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INIT A Page.....C
ROUTE SELECTION PAGE.....D
IRS INIT PAGE.....E
IRS INIT Page.....F
WIND Pages.....G
INIT FUEL PRED Page.....H
INIT B Page.....I
FUEL PREDICTION Page.....J
FLIGHT PLAN Pages.....K
LATERAL REVISION Pages.....L
FIX INFO Page.....M
Offset Page.....N
AIRWAYS Page.....O
DEPARTURE Pages.....P
HOLD PAGES.....Q
DIRECT TO PAGE.....R
ARRIVAL PAGES.....S
ARRIVAL Pages.....T
ALTERNATE Page.....U
ROUTE SELECTION PAGE FOR ALTERNATE.....V
STEP ALTS Page.....W
VERTICAL REVISION Pages.....X
DATA INDEX Pages.....Y
WAYPOINT/STORED WAYPOINT/NEW WAYPOINT Pages.....Z
NAVAID/STORED NAVAID/NEW NAVAID Pages.....AA
RUNWAYS/STORED RUNWAYS/NEW RUNWAY Pages.....AB
ROUTE/STORED ROUTE/NEW ROUTE Pages.....AC
AIRCRAFT STATUS PAGE.....AD
P/N XLOAD PAGE.....AE
P/N STATUS PAGES.....AF
DUPLICATE NAMES Page.....AG
POSITION MONITOR Page.....AH
SELECTED NAVAIDS Page.....AI
IRS MONITOR Page.....AJ

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GPS MONITOR Page .... AK
CLOSEST AIRPORTS PAGES........ AL
EQUI-TIME POINT PAGE........ AM
PRINT FUNCTION Pages........ AN
ACARS FUNCTION Page........ AO
ACARS FUNCTION Page 1........ AP
UPLINK TO DATA REQ Pages........ AQ
UPLINK TO DATA REQ PAGES........ AR
UPLINK TO DATA REQ Pages........ AS
Uplink Max to Data Pages........ AT
Uplink MAX TO Data Pages........ AU
Uplink FLX (or DRT) TO Data Pages........ AV
ACARS FUNCTIONS PAGE 2........ AW
PERF Pages........ AX
PERF TAKEOFF Page........ AY
PERF CLIMB Page........ AZ
PERF CRUISE Page........ BA
PERF DESCENT Page........ BB
PERF DESCENT PAGE........ BC
PERF DESCENT Page........ BD
PERF APPR Page........ BE
PERF GO AROUND Page........ BF
PROG Pages........ BG
Predictive GPS Page........ BH
REPORT PAGE........ BI
REPORT Page........ BJ
RADIO NAV Page........ BK
SECONDARY Pages........ BL
BACK UP NAV Pages........ BM
RTA Page........ BN

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General........ A
A/C POSITION INVALID........ B
ALIGN IRS........ C
ALT CSTR ABOVE CRZ FL........ D
AOC XXX F-PLN UPLINK........ E
AREA RNP IS XX.XX........ F
AWY/WPT MISMATCH........ G
BLOCK IGNORES RTA........ H

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CABIN RATE EXCEEDED....I
CHECK ALTN WIND....J
CHECK APPR SELECTION....K
CHECK CO RTE....L
CHECK DATA BASE CYCLE....M
CHECK DEST DATA....N
CHECK FLT NBR....O
CHECK IRS 1(2)(3)/FM POSITION....P
CHECK IRS/AIRPORT POS....Q
CHECK WEIGHT....R
CHECK MIN DEST FOB....S
CHECK NORTH REF....T
CHECK ONSIDE P/N....U
CHECK QFE....V
CHECK TAKE OFF DATA....W
CLK IS TAKE OFF TIME....X
CLOCK/GPS TIME DIFF....Y
CLOSE RTE REQ FIRST....Z
CROSSLOAD ABORTED....AA
CROSSLOAD COMPLETE....AB
CRZ FL ABOVE MAX FL....AC
CSTR DEL ABOVE CRZ FL....AD
CSTR DEL UP TO XXXXXXX....AE
DATABASE CODING ERROR....AF
DECELERATE....AG
DELETING OFFSET....AH
DELETING SEC OFFSET....AI
DEST EFOB BELOW MIN....AJ
DEST/ALTN MISMATCH....AK
DIR TO IN PROCESS....AL
ENTER DEST DATA....AM
ENTRY OUT OF RANGE....AN
EXTEND SPD BRK....AO
F-G/S BASED ON ISA....AP
F-PLN DATALINK IN PROG....AQ
F-PLN ELEMENT RETAINED....AR
F-PLN FULL....AS
F-PLN UPLINK -XX REJ....AT
FLS SEL: UPDATE MINIMA....AU
FLT NBR UPLINK....AV

Continued on the following page

Continued from the previous page

FM DATALINK UNAVAIL....AW
FMS SETTING SPD/RTA....AX
FMS1/FMS2 A/C STS DIFF....AY
FMS1/FMS2 GW DIFF....AZ
FMS1/FMS2 PGM PIN DIFF....BA
FMS1/FMS2 POS DIFF....BB
FMS1/FMS2 SPD TGT DIFF....BC
FORMAT ERROR ....BD
GPS ◁ IS DESELECTED....BE
GPS PRIMARY ◁ ....BF
GPS PRIMARY ◁ LOST....BG
INDEPENDENT OPERATION ....BH
INITIALIZE ZFW/ZFWCG....BI
INVALID ATC UPLINK....BJ
INVALID F-PLN UPLINK....BK
INVALID FLT NBR UPLINK....BL
INVALID PERF UPLINK....BM
INVALID TAKEOFF UPLINK....BN
INVALID WIND UPLINK....BO
LARGE NDB NOT ALLOWED....BP
LAT DISCONT HEAD....BQ
LIST OF 10 IN USE....BR
LIST OF 20 IN USE....BS
LIST OF 99 IN USE....BT
MACH SEGMENT DELETED....BU
MCDU OVERHEATED....BV
NAV ACCUR DOWNGRAD ....BW
NAV ACCUR UPGRAD ....BX
NEW ACC ALT - HHHH....BY
NEW CRZ ALT - HHHHH....BZ
NEW THR RED ALT - HHHH....CA
NO ANSWER TO REQUEST....CB
NO FLS FOR THIS APPR ◁ CC
NO INTERSECTION FOUND....CD
NO NAV INTERCEPT....CE
NO SLS ◁ FOR THIS APPR....CF
NO SLS ◁ MAN TUNING....CG
NO SLS ◁ : SBAS DESELECTED....CH
NON UNIQUE ROUTE IDENT....CI

Continued on the following page

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NOT ALLOWED.....CJ
NOT ALLOWED IN NAV.....CK
NOT IN DATABASE.....CL
NOT XMITTED TO ACARS.....CM
ONLY SPD ENTRY ALLOWED.....CN
PAGE UPDATE IN PROCESS.....CO
PERF DATA UPLINK.....CP
PLACE/D IN TRANSITION.....CQ
PLEASE WAIT.....CR
PRINTER NOT AVAILABLE.....CS
PROCEDURE RNP IS XX.XX.....CT
RADIONAV IS DESELECTED.....CU
REENTER WEIGHT/CG.....CV
REENTER ZFW/ZFWCG.....CW
REF/GPS POS DIFF CX
REF/LAST IRS POS DIFF.....CY
RESET IRS TO NAV.....CZ
RETRACT SPD BRK.....DA
REVISIONS NOT STORED.....DB
RTA DELETED.....DC
RTA EXISTS.....DD
RTA MISSED AT XXXXXXX.....DE
RWY/LS MISMATCH.....DF
SELECT DESIRED SYSTEM.....DG
SELECT TRUE.....DH
SET GREEN DOT SPEED.....DI
SET HOLD SPEED.....DJ
SET MANAGED SPEED.....DK
SETTING SPD/RTA.....DL
SPD ERROR AT XXXXXXX.....DM
SPD LIM EXCEEDED.....DN
SPECIF NDB UNAVAIL.....DO
SPECIF VOR-D UNAVAIL.....DP
STEP ABOVE MAX FL .....DQ
STEP AHEAD.....DR
STEP DELETED.....DS
STORED ROUTES FULL.....DT
T/D REACHED.....DU
TAKE OFF DATA UPLINK.....DV
TEMPORARY F-PLN EXISTS.....DW

Continued on the following page

Continued from the previous page

TIME ERROR AT XXXXXXX....DX
TIME MARKER LIST FULL....DY
TIME TO EXIT....DZ
TMPY UPLINK DELETED....EA
TO SPEEDS TOO LOW....EB
TOO STEEP PATH AHEAD....EC
TUNE BBB FFF.FF....ED
TURN AREA EXCEEDANCE....EE
UNKNOWN PROGRAM PIN....EF
UPLINK INSERT IN PROG....EG
UPLINK INSERTED IN SEC....EH
UPLINK INSERTED IN TMPY....EI
USING COST INDEX-NNN....EJ
V1/VR/V2 DISAGREE....EK
WAIT FOR SYSTEM RESPONSE....EL
WIND DATA UPLINK....EM
WIND UPLINK EXISTS....EN
WIND UPLINK PENDING....EO
WIND/TEMP UPLK PENDING....EP
XXXX IS DESELECTED....EQ

DSC-22_20-50-30 MCDU - Data Format List

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Localization Title	Toc Index	ID	Reason
DSC-22_20-100-20 TAB - Inadvertent T.O. Speeds Reversion upon RWY Change	S	1	Documentation update: Addition of "TAB - Inadvertent T.O. Speeds Reversion upon RWY Change" documentary unit

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GENERAL

Ident.: DSC-22_20-10-00009965.0001001 / 16 MAR 11
Applicable to: ALL

The Flight Management (FM) part controls the following functions:
- Navigation
- Management of flight planning
- Prediction and optimization of performance
- Management of navigation radios
- Management of displays (MCDU, ND, PFD).

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NAVIGATION

Ident.: DSC-22_20-20-05-00009966.0001001 / 17 MAR 11
Applicable to: ALL

Essential navigation functions are:
- Computation of position
- Evaluation of position accuracy
- Radio navigation tuning
- Alignment of Inertial Reference System.

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GENERAL

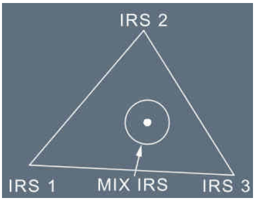
Ident.: DSC-22_20-20-10-00011522.0002001 / 18 AUG 10
Applicable to: ALL

Each FMGEC computes its own aircraft position (called the "FM position") from a MIX IRS position and a computed radio position or GPS position.
The FMGES selects the most accurate position, considering the estimated accuracy and integrity of each positioning equipment.
GPS/INERTIAL is the basic navigation mode, provided GPS data is valid and successfully tested. Otherwise, navaids plus inertial or inertial only are used. (*Refer to DSC-22_20-20-10 Navigation Modes*).

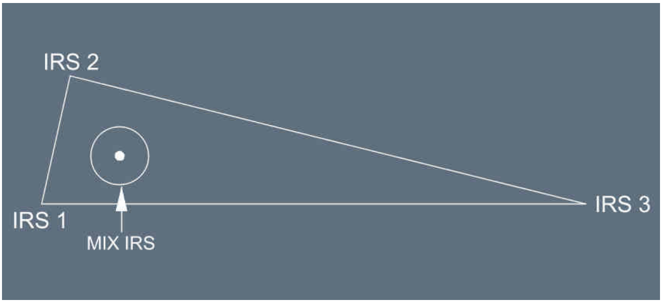
MIX IRS POSITION

Ident.: DSC-22_20-20-10-00011523.0001001 / 18 AUG 10
Applicable to: ALL

Each FMGEC receives a position from each of the three IRSs, and computes a mean-weighted average called the "MIX IRS" position.



- If one of the IRSs drifts abnormally, the MIX IRS position uses an algorithm that decreases the influence of the drifting IRS within the MIX IRS position.



- If one of the IRSs fails, each FMGEC uses only one IRS (onside IRS or IRS3). Each IRS position and inertial speed are continuously tested. If the test fails, the corresponding IRS is rejected.

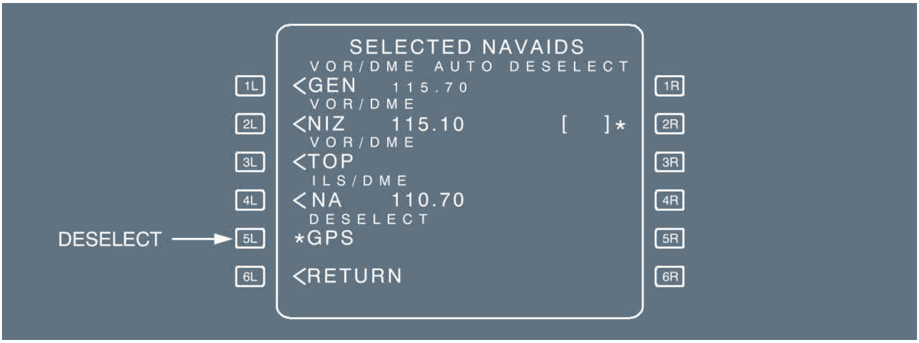
GPS POSITION

Ident.: DSC-22_20-20-10-00011524.0005001 / 20 DEC 13
Applicable to: ALL

Each IRS computes a mixed IRS/GPS position called the GPIRS position. For this, each IRS can independently select their GPS source in order to maximize the availability of GPS data. Of the three GPIRS positions that each FMGEC receives, the FMS selects one GPIRS position based on a figure of merit and priority.

The FMS uses the following hierarchy to perform the selection:
- Onside GPIRS position
- GPIRS 3
- Opposite GPIRS position.

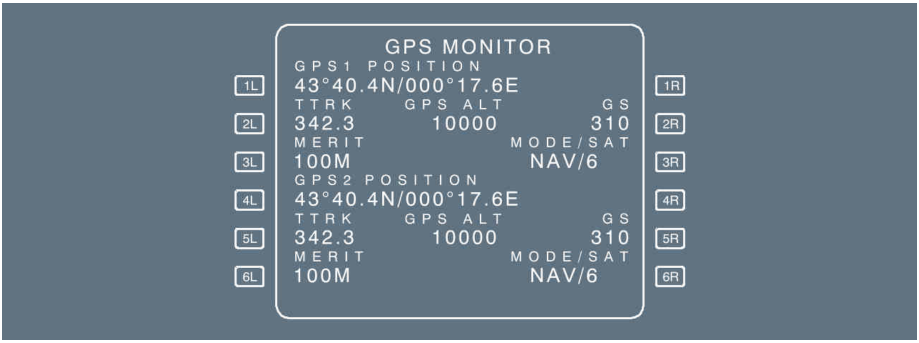
If the GPIRS data does not comply with an integrity criterion that is based on a Horizontal Integrity Limit (HIL) and on the automatic detection of failed satellites, the FMS rejects the GPS mode and uses the radio position update.
The flight crew can deselect/select the GPS position on the SELECTED NAVAIDS page, if necessary.



```
        SELECTED NAVAIDS
  VOR/DME   AUTO DESELECT
<GEN    115.70
  VOR/DME
<NIZ    115.10        [   ]*
  VOR/DME
<TOP
  ILS/DME
<NA     110.70
  DESELECT
*GPS

<RETURN
```

Information about the GPS position is displayed on the GPS MONITOR page.



```
             GPS MONITOR
GPS1 POSITION
43°40.4N/000°17.6E
TTRK         GPS ALT            GS
342.3         10000            310
MERIT                     MODE/SAT
100M                         NAV/6
GPS2 POSITION
43°40.4N/000°17.6E
TTRK         GPS ALT            GS
342.3         10000            310
MERIT                     MODE/SAT
100M                         NAV/6
```

<u>Note:</u> *In nominal case, ADIRU1 selects GPS1 and ADIRU2 selects GPS2. The GPS selection by ADIRU3 depends on the position of the ATT HDG selector switch. If one of the GPS source is rejected by the ADIRUs, all ADIRUs will select the same GPS source. As a result, the data of the GPS that is not selected is dashed on the GPS MONITOR page. The “GPS PRIMARY LOST” message may not be displayed.*

RADIO POSITION

Ident.: DSC-22_20-20-10-00011525.0002001 / 20 SEP 12
Applicable to: ALL

Each FMGEC uses onside navaids to compute its own radio position. These navaids are displayed on the SELECTED NAVAIDS page.

The available navaids are:
- DME/DME
- VOR/DME
- LOC
- DME/DME-LOC
- VOR/DME-LOC.

It uses LOC to update the lateral position, using LOC beam during ILS approach.
LOC is also used for quick update, when in GPS/IRS mode if GPS ◁ , or in IRS mode otherwise.
If one or more navaids fail, each FMGEC can use offside navaids to compute the VOR/DME or DME/DME radio position.
The radio navaid selection is displayed on the DATA "SELECTED NAVAIDS" page.

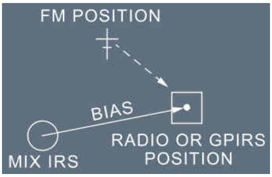
FM POSITION

Ident.: DSC-22_20-20-10-00011526.0009001 / 18 AUG 10
Applicable to: ALL

At flight initialization, each FMGEC displays an FM position that is the mixed IRS/GPS position (GPIRS):

- At takeoff, the FM position is updated to the runway threshold position, as stored in the database and corrected by the takeoff shift when entered by the flight crew.
- In flight, the FM position approaches the radio position, or the GPS position at a rate that depends upon the aircraft altitude.

Note: The FM position update at takeoff is inhibited when GPS PRIMARY is active.



For each IRS, the FMGECs compare the FM position with the IRS position. When this difference exceeds a threshold (depending on the elapsed time since IRS alignment), the "CHECK IRS (1, 2 or 3)/FM POSITION" message is displayed on the MCDUs.
When the FWC detects an abnormal IRS drift, the ECAM triggers the "FM/IR POSITION DISAGREE" message.

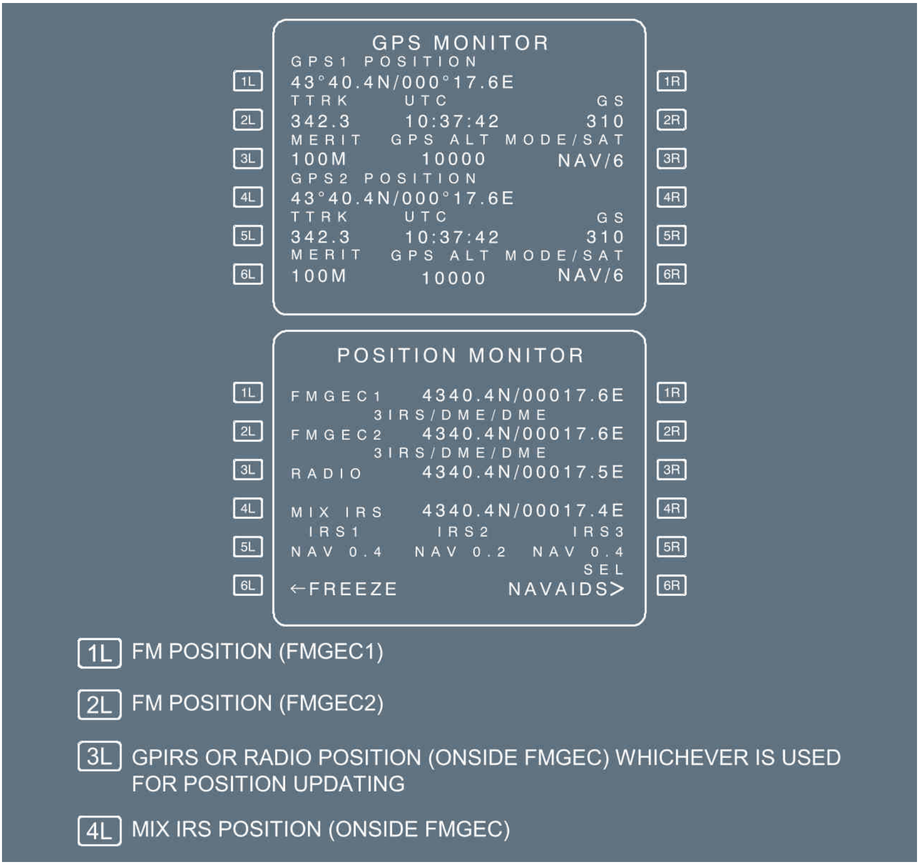
BIAS

Each FMGEC computes a vector from its MIX IRS position to the radio or GPIRS position. This vector is called the "bias".
Each FMGEC continuously updates its bias, if a radio position, or a GPIRS position is available.
If an FMGEC loses its radio/GPIRS position, it memorizes the bias and uses it to compute the FM position, which equals the MIX IRS position plus the bias. Until the radio or the GPIRS position is restored, the bias does not change.
The flight crew can manually update the FM position. This also updates the bias.

POSITION MONITOR

Ident.: DSC-22_20-20-10-00011527.0009001 / 07 MAY 13
Applicable to: ALL

The flight crew may check the position computation using the GPS MONITOR or POSITION MONITOR page.



```
              GPS MONITOR
GPS1 POSITION
43°40.4N/000°17.6E
TTRK        UTC              GS
342.3       10:37:42        310
MERIT   GPS ALT   MODE/SAT
100M        10000         NAV/6
GPS2 POSITION
43°40.4N/000°17.6E
TTRK        UTC              GS
342.3       10:37:42        310
MERIT   GPS ALT   MODE/SAT
100M        10000         NAV/6
```

```
            POSITION MONITOR

FMGEC1      4340.4N/00017.6E
              3IRS/DME/DME
FMGEC2      4340.4N/00017.6E
              3IRS/DME/DME
RADIO       4340.4N/00017.5E

MIX IRS     4340.4N/00017.4E
  IRS1         IRS2        IRS3
NAV 0.4     NAV 0.2     NAV 0.4
                            SEL
←FREEZE                NAVAIDS>
```

1L FM POSITION (FMGEC1)

2L FM POSITION (FMGEC2)

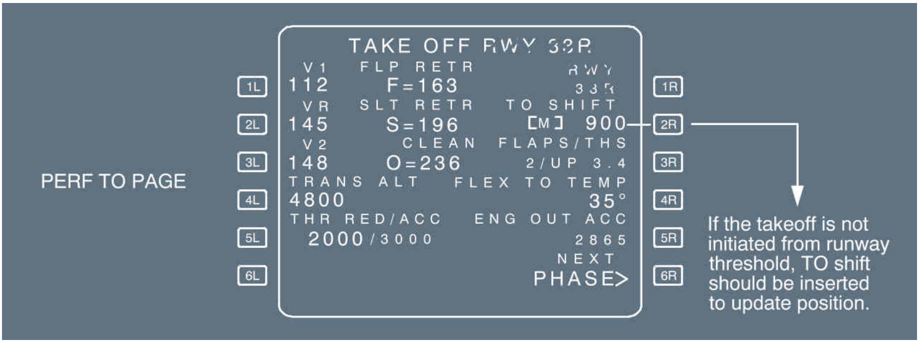
3L GPIRS OR RADIO POSITION (ONSIDE FMGEC) WHICHEVER IS USED FOR POSITION UPDATING

4L MIX IRS POSITION (ONSIDE FMGEC)

TAKEOFF UPDATE

Ident.: DSC-22_20-20-10-00012327.0006001 / 04 AUG 16
Applicable to: ALL

A takeoff update requires that the takeoff runway be part of the flight plan. This provides the most accurate position update.
If the takeoff run starts at an intersection, enter a takeoff shift on the PERF TO page to refine the takeoff update.
An accurate takeoff update ensures a precise aircraft position during departure.



PERF TO PAGE

TAKE OFF RWY 33R
V1 FLP RETR RWY
112 F=163 33R
VR SLT RETR TO SHIFT
145 S=196 [M] 900
V2 CLEAN FLAPS/THS
148 O=236 2/UP 3.4
TRANS ALT FLEX TO TEMP
4800 35°
THR RED/ACC ENG OUT ACC
2000/3000 2865
NEXT
PHASE>

If the takeoff is not initiated from runway threshold, TO shift should be inserted to update position.

NAVIGATION MODES

Ident.: DSC-22_20-20-10-00011528.0002001 / 15 NOV 21
Applicable to: ALL

The FMGES updates the FM position via the use of radio navaids or GPS, if available. It can use four different FM navigation modes to make this update.

The decreasing order of priority is:
- IRS-GPS
- IRS-DME/DME
- IRS-VOR/DME
- IRS only.

During approach flown with ILS / GLS or SLS , the system performs a temporary lateral update, via one of the following modes:
- IRS-GPS/LOC
- IRS-DME/DME-LOC
- IRS-VOR/DME-LOC
- IRS-LOC.

GENERAL

Ident.: DSC-22_20-20-20-00012229.0009001 / 16 JAN 18
Applicable to: ALL

The FMGES continuously computes an Estimated Position Uncertainty (EPU).
It is an estimate of how much the FM position diverged, and it is a function of the navigation mode that the system uses.

CURRENT NAV MODE	EPU (RATE or THRESHOLD)	REMARK
IRS/GPS	$\sqrt{(FOM^2 + 100^2)}$ (in meters)	FOM = Figure of Merit of GPS position. If above 0.28 NM, the FMS rejects the GPS position.
IRS/DME/DME	Moves toward 0.28 NM.	EPU decreases from the initial value to 0.28 NM.
IRS/VOR/DME	0.1 NM + 0.05 X DME DIST. Minimum: 0.28 NM.	Dependent on the distance between the aircraft and the VOR/DME.
IRS ONLY	+8 NM/h for the first 30 min. 0 NM/h for the following 60 min. +4 NM/h for the following 30 min. 0 NM/h for the following 60 min. +2 NM/h after.	EPU increases continuously.

Note: *After an IRS alignment or at takeoff, the EPU is set to 0.2 NM.*

ESTIMATED POSITION UNCERTAINTY

Ident.: DSC-22_20-20-20-00012230.0043001 / 09 DEC 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The FMS displays the EPU to the flight crew and compares it with the Required Navigation Performance (RNP):
- If the EPU does not exceed the RNP, accuracy is HIGH
- If the EPU exceeds the RNP, accuracy is LOW.

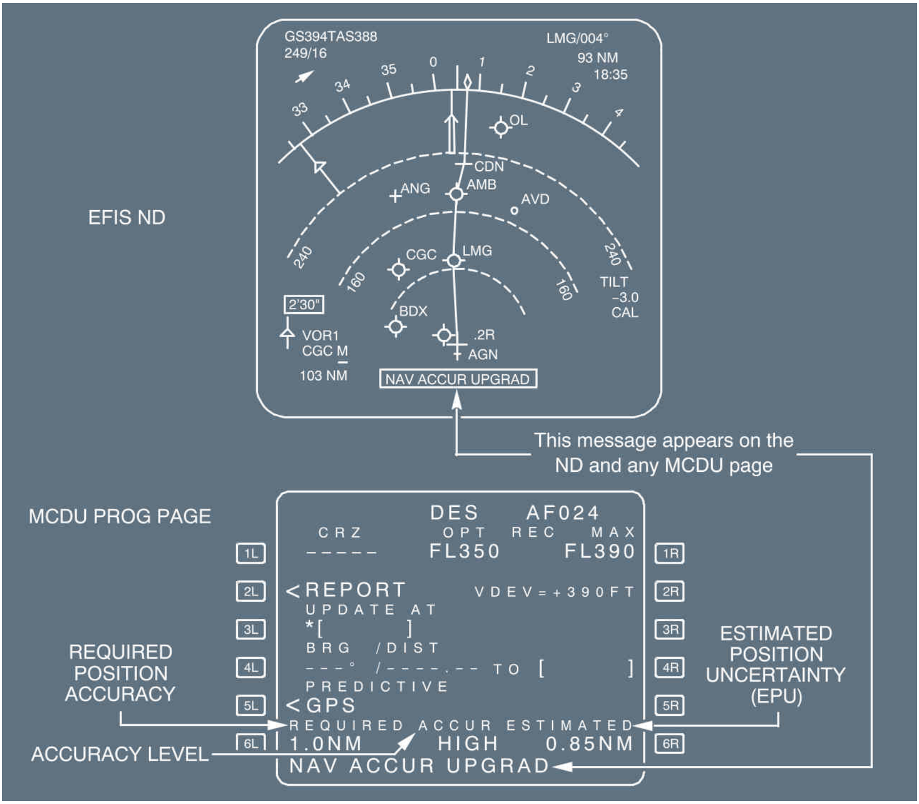
The RNP is displayed in the REQUIRED field of the PROG page. The displayed RNP is (in a decreasing order of priority):
- The value that the flight crew entered
- The navigation database procedure value
- The system’s default value

When a flight crew enters an RNP that is higher than the published value, one of the following messages is displayed: "PROCEDURE RNP IS XX.XX" or "AREA RNP IS XX.XX".
When this occurs, the flight crew should verify the RNP value that was manually entered in the REQUIRED field of the PROG page, and clear or modify it if necessary.

The "AREA RNP IS XX.XX" message is also displayed at the change of flight area if the new RNP (default value) is smaller than the displayed RNP (manually entered).

DEFAULT AREA RNP VALUES	
EN ROUTE and OCEANIC	2 NM
TERMINAL and TAKEOFF	1 NM
APPROACH	GPS / RNAV(GNSS)0.3 NM OTHER CASES 0.5 NM

When one FMGEC changes the NAV accuracy from LOW to HIGH (or HIGH to LOW), the MCDU and the ND display the "NAV ACCUR UPGRAD" (or DOWNGRAD) message. These messages are inhibited when the navigation mode is IRS/GPS.


EFIS ND
GS394TAS388
249/16
LMG/004°
93 NM
18:35
33
34
35
0
1
2
3
4
OL
CDN
AMB
ANG
AVD
240
160
CGC
LMG
240
160
TILT
-3.0
CAL
2'30"
BDX
VOR1
CGC M
103 NM
.2R
AGN
NAV ACCUR UPGRAD
MCDU PROG PAGE
DES AF024
CRZ
OPT
REC
MAX

FL350
FL390
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
<REPORT
VDEV=+390FT
UPDATE AT
*[ ]
BRG /DIST
---° /----.-- TO [ ]
PREDICTIVE
<GPS
REQUIRED ACCUR ESTIMATED
1.0NM HIGH 0.85NM
NAV ACCUR UPGRAD
REQUIRED POSITION ACCURACY
ACCURACY LEVEL
ESTIMATED POSITION UNCERTAINTY (EPU)

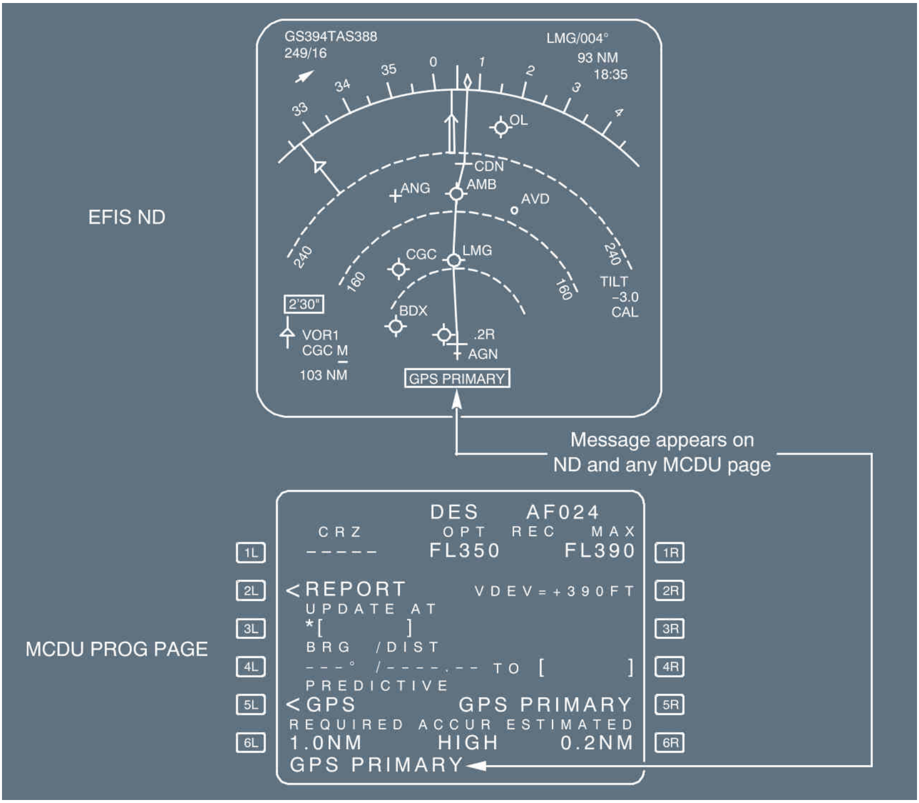
This message appears on the ND and any MCDU page

When in IRS/GPS mode, the GPS PRIMARY status combines two different criteria:

- The accuracy criterion previously described (HIGH/LOW accuracy)
- An integrity criterion: This is the capability to detect a failure and provide appropriate warning of it. This criterion indicates the confidence that the flight crew can have in the FMS position.

If the GPS PRIMARY status complies with both criteria, "GPS PRIMARY" is displayed on the MCDU (PROG page, [5R] field and scratchpad) and temporarily on the ND.
If the GPS PRIMARY status no longer complies with one of these criteria (Navigation accuracy downgraded or integrity lost), the GPS PRIMARY status is lost, and the MCDU and the ND display the "GPS PRIMARY LOST" message. It is possible to clear the scratchpad message on the MCDU, but not on the ND. During a non-precision approach, a triple-click warning is also triggered.

CAUTION	"HIGH" or "LOW" on the PROG page indicates the FM position accuracy, based on estimated uncertainty. When GPS PRIMARY mode is lost, the flight crew must periodically check this position accuracy. In GPS PRIMARY mode, the position accuracy is always at HIGH.


EFIS ND
GS394TAS388
249/16
LMG/004°
93 NM
18:35
33
34
35
0
1
2
3
4
OL
CDN
ANG
AMB
AVD
240
160
CGC
LMG
240
160
TILT
-3.0
CAL
2'30"
BDX
VOR1
CGC M
103 NM
.2R
AGN
GPS PRIMARY
MCDU PROG PAGE
DES AF024
CRZ OPT REC MAX
----- FL350 FL390
<REPORT VDEV=+390FT
UPDATE AT
*[ ]
BRG /DIST
---° /----.-- TO [ ]
PREDICTIVE
<GPS GPS PRIMARY
REQUIRED ACCUR ESTIMATED
1.0NM HIGH 0.2NM
GPS PRIMARY
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Message appears on ND and any MCDU page

When the GPS is manually deselected, the "GPS IS DESELECTED" message is displayed on the MCDU, 80 NM before T/D or at approach phase transition.

ESTIMATED POSITION UNCERTAINTY

Ident.: DSC-22_20-20-20-00012230.0042001 / 23 AUG 13
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

The FMS displays the EPU to the flight crew and compares it with the Required Navigation Performance (RNP):

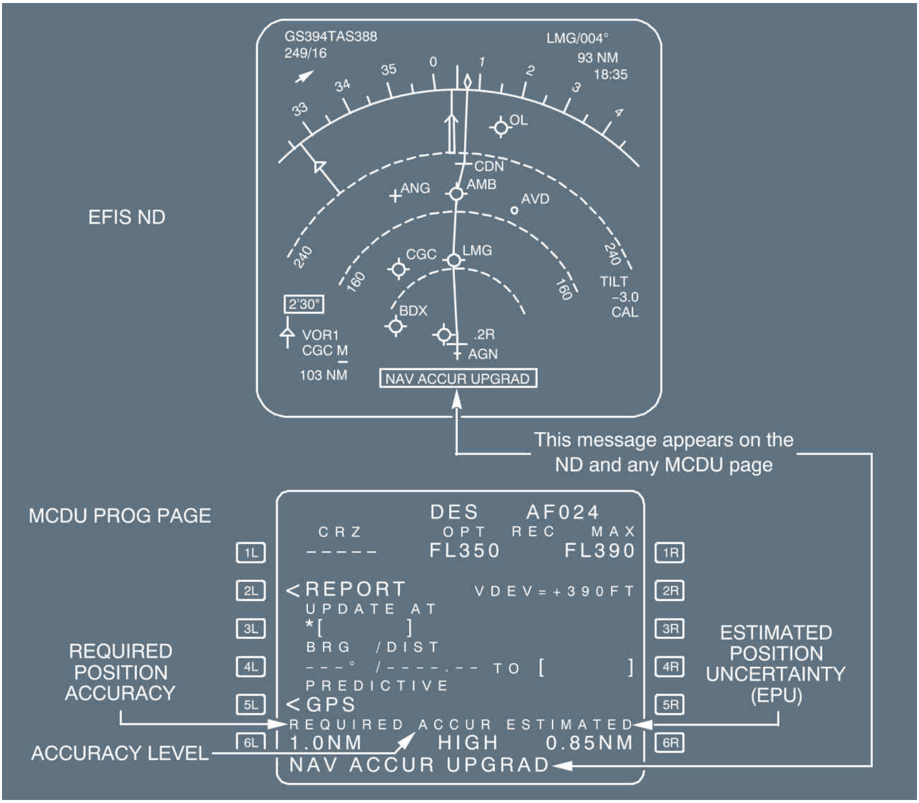
- If the EPU does not exceed the RNP, accuracy is HIGH
- If the EPU exceeds the RNP, accuracy is LOW.

The RNP is displayed in the REQUIRED field of the PROG page. The displayed RNP is (in a decreasing order of priority):
- The value that the flight crew entered
- The navigation database procedure value
- The system's default value

When a flight crew enters an RNP that is higher than the published value, one of the following messages is displayed: "PROCEDURE RNP IS XX.XX" or "AREA RNP IS XX.XX".
When this occurs, the flight crew should verify the RNP value that was manually entered in the REQUIRED field of the PROG page, and clear or modify it if necessary.
The "AREA RNP IS XX.XX" message is also displayed at the change of flight area if the new RNP (default value) is smaller than the displayed RNP (manually entered).

DEFAULT AREA RNP VALUES	
EN ROUTE and OCEANIC	2 NM
TERMINAL and TAKEOFF	1 NM
APPROACH	GPS 0.3 NM OTHER CASES 0.5 NM

When one FMGEC changes the NAV accuracy from LOW to HIGH (or HIGH to LOW), the MCDU and the ND display the "NAV ACCUR UPGRAD" (or DOWNGRAD) message. These messages are inhibited when the navigation mode is IRS/GPS.


EFIS ND
GS394TAS388
249/16
LMG/004°
93 NM
18:35
33
34
35
0
1
2
3
4
OL
CDN
AMB
ANG
AVD
240
CGC
LMG
160
TILT
-3.0
CAL
2'30"
BDX
VOR1
CGC M
103 NM
.2R
AGN
NAV ACCUR UPGRAD
This message appears on the ND and any MCDU page
MCDU PROG PAGE
DES AF024
CRZ
OPT
REC
MAX

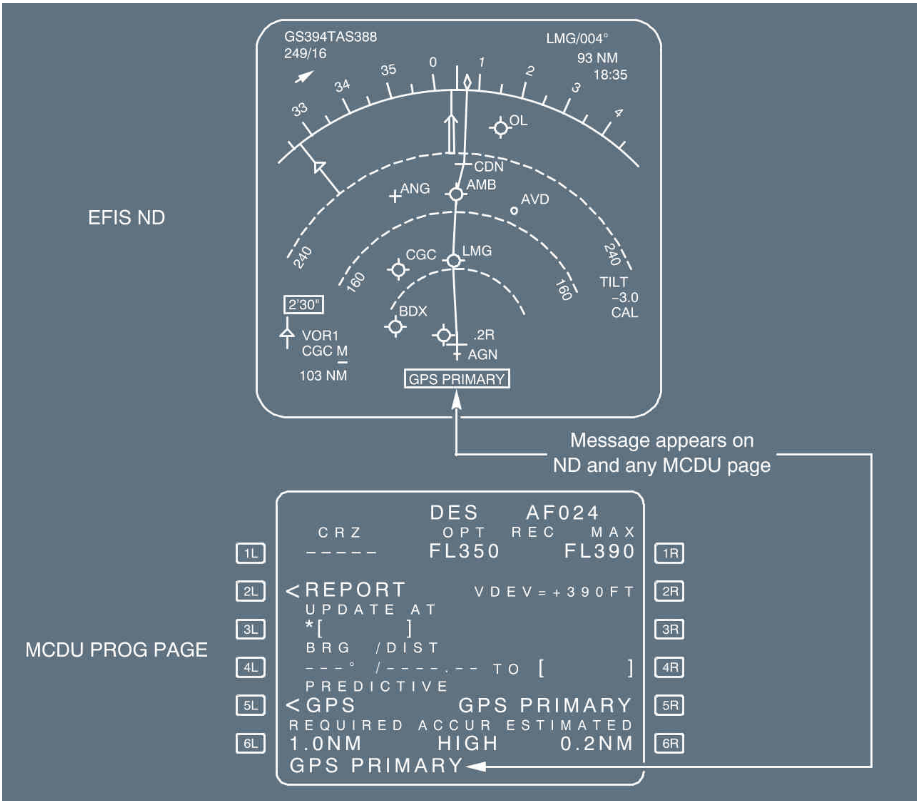
FL350
FL390
<REPORT
VDEV=+390FT
UPDATE AT
*[ ]
BRG /DIST
---° /----.-- TO [ ]
PREDICTIVE
<GPS
REQUIRED ACCUR ESTIMATED
1.0NM
HIGH
0.85NM
NAV ACCUR UPGRAD
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
REQUIRED POSITION ACCURACY
ACCURACY LEVEL
ESTIMATED POSITION UNCERTAINTY (EPU)

When in IRS/GPS mode, the GPS PRIMARY status combines two different criteria:

- The accuracy criterion previously described (HIGH/LOW accuracy)
- An integrity criterion: This is the capability to detect a failure and provide appropriate warning of it. This criterion indicates the confidence that the flight crew can have in the FMS position.

If the GPS PRIMARY status complies with both criteria, "GPS PRIMARY" is displayed on the MCDU (PROG page, [5R] field and scratchpad) and temporarily on the ND.
If the GPS PRIMARY status no longer complies with one of these criteria (Navigation accuracy downgraded or integrity lost), the GPS PRIMARY status is lost, and the MCDU and the ND display the "GPS PRIMARY LOST" message. It is possible to clear the scratchpad message on the MCDU, but not on the ND.

CAUTION	"HIGH" or "LOW" on the PROG page indicates the FM position accuracy, based on estimated uncertainty. When GPS PRIMARY mode is lost, the flight crew must periodically check this position accuracy. In GPS PRIMARY mode, the position accuracy is always at HIGH.


EFIS ND
GS394TAS388
249/16
LMG/004°
93 NM
18:35
33
34
35
0
1
2
3
4
OL
CDN
ANG
AMB
AVD
240
CGC
LMG
160
TILT
-3.0
CAL
2'30"
BDX
VOR1
CGC M
103 NM
.2R
AGN
GPS PRIMARY
Message appears on ND and any MCDU page
MCDU PROG PAGE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
DES AF024
CRZ OPT REC MAX
----- FL350 FL390
<REPORT VDEV=+390FT
UPDATE AT
*[ ]
BRG /DIST
---° /----.-- TO [ ]
PREDICTIVE
<GPS GPS PRIMARY
REQUIRED ACCUR ESTIMATED
1.0NM HIGH 0.2NM
GPS PRIMARY

When the GPS is manually deselected, the "GPS IS DESELECTED" message is displayed on the MCDU, 80 NM before T/D or at approach phase transition.

FM/GPS POSITION DISAGREEMENT

Ident.: DSC-22_20-20-20-00012338.0002001 / 18 AUG 10
Applicable to: ALL

The lower ECAM displays the "NAV FM/GPS POS DISAGREE" amber caution, when the GPS PRIMARY function is active, and when either of the FMGEC positions deviates from the GPS positions 1 or 2 by more than:

- 0.5' of latitude
- For longitude:
  - 0.5' of longitude, when the aircraft latitude is between 0° and 45°
  - 0.7' of longitude, when the aircraft latitude is between 45° and 60°
  - 1' of longitude, when the aircraft latitude is between 60° and 70°.

Above 70° of latitude, a longitude difference does not trigger the alarm.
The master caution light comes on, and the single chime sounds. This amber caution is inhibited during the takeoff phase.

GENERAL

Ident.: DSC-22_20-20-30-00011539.0001001 / 18 AUG 10
Applicable to: ALL

Radio navaids are tuned for two different purposes: Display and computation.

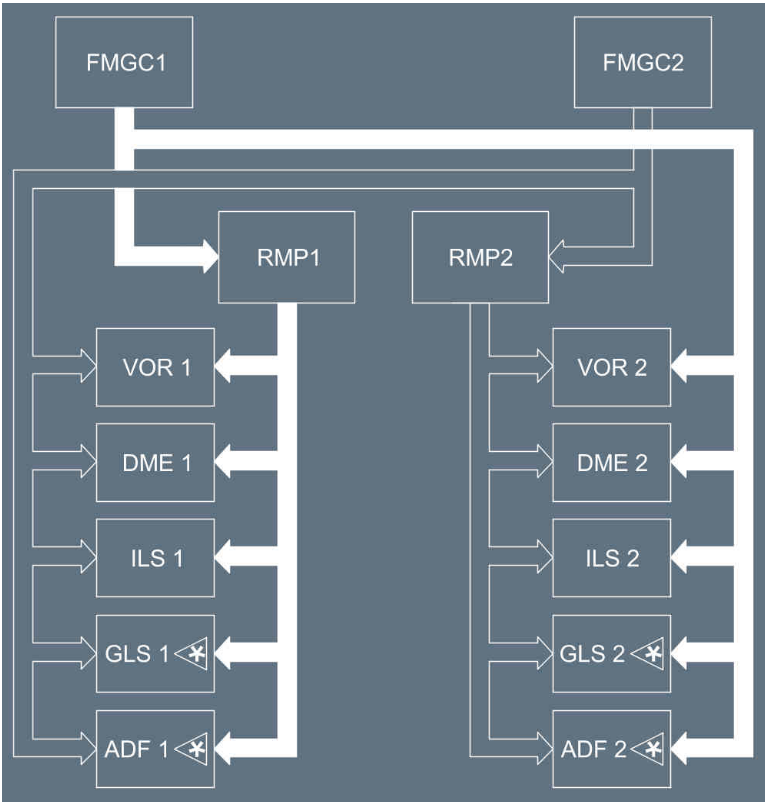
It is possible to perform tuning for display in three different ways:
- Automatic tuning via FMGEC software
- Manual tuning via the MCDU RAD NAV
- Manual tuning via the Radio Management Panel (RMP) if both FMGECs or both MCDUs fail.

The FMGES automatically tunes the radio navaids for computation of the radio position.

Note: *The manual selection of a VOR or VOR/DME may prevent the FMGES from automatically tuning a VOR/DME to compute position. In this case, the related MCDU displays “TUNE BBB FFF.FF” (BBB = ident, FFF.FF = frequency).*

ARCHITECTURE

Ident.: DSC-22_20-20-30-00011540.0008001 / 12 FEB 13
Applicable to: ALL



- In dual mode and independent mode, each FMGEC simultaneously tunes the navaids on its own side (one VOR, one DME, one ILS/GLS ◁✳ , and one ADF ◁✳). In these modes, the flight crew can also manually tune the VOR (and associated DME), the ILS/GLS ◁✳ , and the ADF ◁✳ .
- In single mode, the valid FMGEC tunes navaids on both sides. The flight crew can also use the RAD NAV page to manually tune both VORs, both ADFs ◁✳ and the ILS/GLS ◁✳ .

Manual tuning has priority over automatic tuning.

Note: *If one radio receiver fails, both FMGECs use the operative radio receiver to compute the position of the aircraft.*

VOR

Ident.: DSC-22_20-20-30-00011541.0001001 / 18 AUG 10
Applicable to: ALL

Each FMGEC may tune one VOR only (manually or automatically).

Automatic tuning complies with the following priorities for tuning the VOR:
1. The specified navaid for the approach
2. The navaid that the flight crew should use to compute the current radio position
3. For display purposes:
   - A specified navaid for the active flight leg
   - The “TO” waypoint (TO WPT), if it is a navaid
   - The “FROM” waypoint (FROM WPT), if it is a navaid
   - A waypoint farther along the flight path, if it is a navaid
   - The navaid closest to the current position of the aircraft.

The scratchpad displays “SPECIFIC VOR-D UNAVAIL” if the VOR or the VOR/DME that the flight crew requires for tuning is deselected.

Note: *If the manual selection of a VOR does not agree with the VOR requested for automatic tuning, the related MCDU displays : “TUNE BBB CRS XXX” (BBB = ident of the requested VOR) ; (XXX = course of the requested VOR)*

DME

Ident.: DSC-22_20-20-30-00011542.0003001 / 18 AUG 10
Applicable to: ALL

Each FMGEC automatically uses its four DME frequencies as follows:
- One DME frequency for display. It is possible to tune it manually or automatically. This DME frequency is also used for computation of the VOR/DME position.
- Two DME frequencies in DME/DME mode to calculate the radio position of the aircraft. The FMGEC automatically tunes these as a function of their best accuracy. The flight crew does not receive any indication that this process is happening.
- One DME frequency connected to ILS/DME.

ADF

Ident.: DSC-22_20-20-30-00011544.0001001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The FMGEC automatically tunes one ADF in any area if the "TO" or "FROM" waypoint is a Non Directional Beacon (NDB), or in approach when the flight plan specifies an NDB approach and a fix in the approach is the "TO" waypoint. The scratchpad displays “SPECIFIC NDB UNAVAIL” if the NDB that the flight crew requires for automatic tuning is deselected.

ILS/MLS

Ident.: DSC-22_20-20-30-00011548.0001001 / 18 AUG 10
Applicable to: ALL

Each FMGEC automatically tunes one ILS frequency (and one MLS ◁ simultaneously):
- In PREFLIGHT or TAKEOFF phase, when the takeoff runway has an associated ILS/MLS
- In CLIMB, CRUISE, DESCENT, APPROACH, or GO-AROUND phase, when the type of approach in the flight plan is ILS/MLS
- When the direct distance to the destination is less than 300 NM.

The scratchpad displays “RWY/LS MISMATCH”, when the flight crew has manually tuned the ILS, and the entered frequency disagrees with the LS or LOC IDENT/FREQ requested for autotuning.

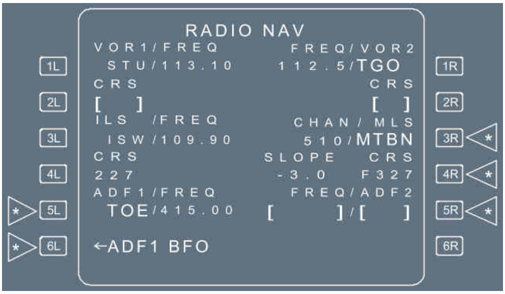
SELECTION OF NAVAIDS ON MCDU PAGES

Ident.: DSC-22_20-20-30-00011549.0001001 / 12 JUL 12
Applicable to: LV-GKO, LV-GKP

The MCDU displays the navaids tuned by the FMGEC on two pages:
- The RADIO NAV page
- The SELECTED NAVAIDS page.

THE RADIO NAV PAGE

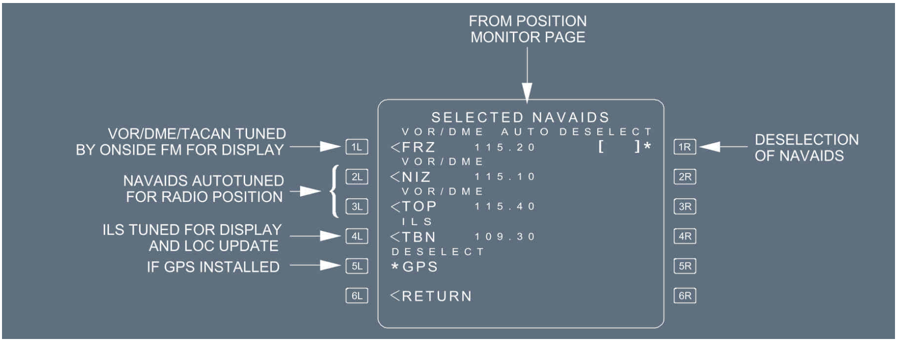
This page shows which navaids have been automatically or manually tuned for display.



```
             RADIO NAV
VOR1/FREQ                 FREQ/VOR2
 STU/113.10              112.5/TGO
CRS                             CRS
[    ]                        [   ]
ILS  /FREQ               CHAN/  MLS
 ISW/109.90               510/MTBN
CRS                   SLOPE     CRS
227                    -3.0    F327
ADF1/FREQ                 FREQ/ADF2
 TOE/415.00          [       ]/[   ]
←ADF1 BFO
```

THE SELECTED NAVAIDS PAGE

This page lists the navaids tuned by the onside FMGEC. No navaids can be modified on this page. The flight crew can deselect up to 6 unreliable navaids for the whole flight (using 1R key).


FROM POSITION MONITOR PAGE
VOR/DME/TACAN TUNED BY ONSIDE FM FOR DISPLAY
NAVAIDS AUTOTUNED FOR RADIO POSITION
ILS TUNED FOR DISPLAY AND LOC UPDATE
IF GPS INSTALLED
DESELECTION OF NAVAIDS
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
     SELECTED NAVAIDS
 VOR/DME   AUTO DESELECT
<FRZ     115.20       [   ]*
 VOR/DME
<NIZ     115.10
 VOR/DME
<TOP     115.40
 ILS
<TBN     109.30
DESELECT
*GPS

<RETURN
```

SELECTION OF NAVAIDS ON MCDU PAGES

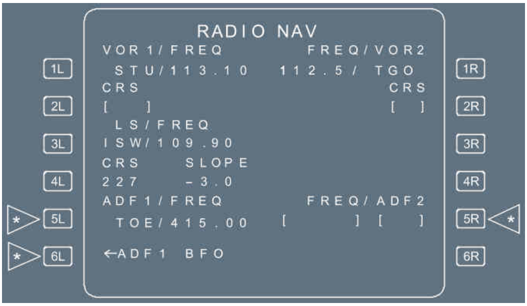
Ident.: DSC-22_20-20-30-00011549.0048001 / 14 AUG 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The MCDU displays the navaids tuned by the FMGEC on two pages:

- The RADIO NAV page
- The SELECTED NAVAIDS page.

THE RADIO NAV PAGE

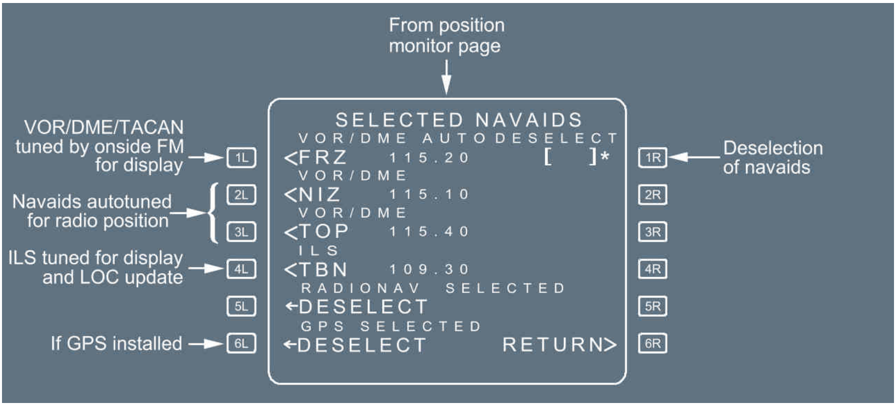
This page shows which navaids have been automatically or manually tuned for display.


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
*
*
*

```
          RADIO NAV
VOR1/FREQ           FREQ/VOR2
 STU/113.10      112.5/ TGO
CRS                       CRS
[   ]                   [   ]
 LS/FREQ
ISW/109.90
CRS      SLOPE
227      -3.0
ADF1/FREQ           FREQ/ADF2
 TOE/415.00    [     ] [    ]
←ADF1  BFO
```

THE SELECTED NAVAIDS PAGE

This page lists the navaids tuned by the onside FMGEC. No navaids can be modified on this page. The flight crew can deselect up to 4 unreliable navaids for the whole flight (using 1R key), or deselect them all (using 5L key).



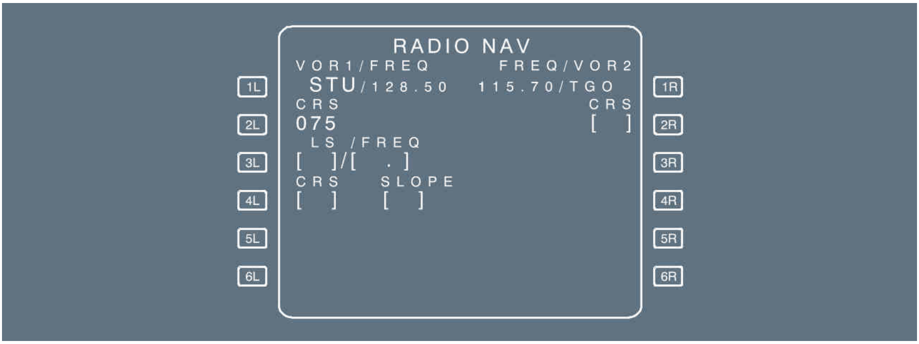
```
       SELECTED NAVAIDS
  VOR/DME AUTODESELECT
<FRZ     115.20       [   ]*
  VOR/DME
<NIZ     115.10
  VOR/DME
<TOP     115.40
  ILS
<TBN     109.30
  RADIONAV SELECTED
←DESELECT
  GPS SELECTED
←DESELECT             RETURN>
```

From position monitor page
VOR/DME/TACAN tuned by onside FM for display
Navaids autotuned for radio position
ILS tuned for display and LOC update
If GPS installed
Deselection of navaids
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

MANUAL TUNING

Ident.: DSC-22_20-20-30-00011550.0030001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

WRITE the identifier on the RAD NAV page.
Preferably use the identifier.



```
          RADIO NAV
VOR1/FREQ        FREQ/VOR2
 STU/128.50    115.70/TGO
CRS                    CRS
075                   [   ]
 LS /FREQ
[   ]/[   .  ]
CRS     SLOPE
[   ]   [   ]
```

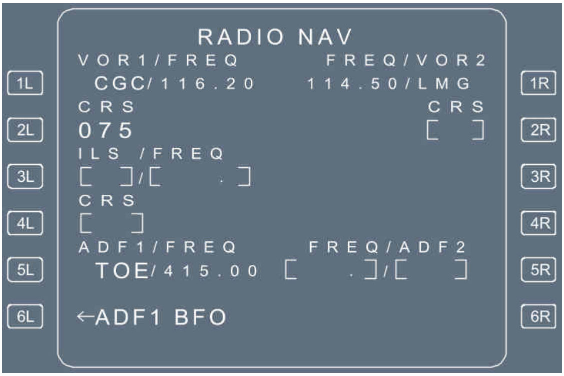
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

- **If the MCDU displays "NOT IN DATA BASE":**
  - WRITE the frequency.
  - DISREGARD the ident that comes up in small font on the MCDU.
    When a frequency is entered in the VOR field, the FMGEC automatically associates the tuned frequency to the closest navaid identifier with the same frequency, and display it on the RAD NAV page. This identifier may not be corresponding to the tuned navaid.
    If the closest navaid found in the database is of a different type (e.g. VOR instead of VOR/DME), the flight crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).
  - ENTER the course.

MANUAL TUNING

Ident.: DSC-22_20-20-30-00011550.0001001 / 17 MAR 11
Applicable to: LV-GKO, LV-GKP

WRITE the identifier on the RAD NAV page.
Preferably use the identifier.



```
            RADIO NAV
VOR1/FREQ              FREQ/VOR2
 CGC/116.20          114.50/LMG
CRS                          CRS
075                         [  ]
ILS /FREQ
[  ]/[    .  ]
CRS
[  ]
ADF1/FREQ          FREQ/ADF2
 TOE/415.00   [   .  ]/[   ]

←ADF1 BFO
```

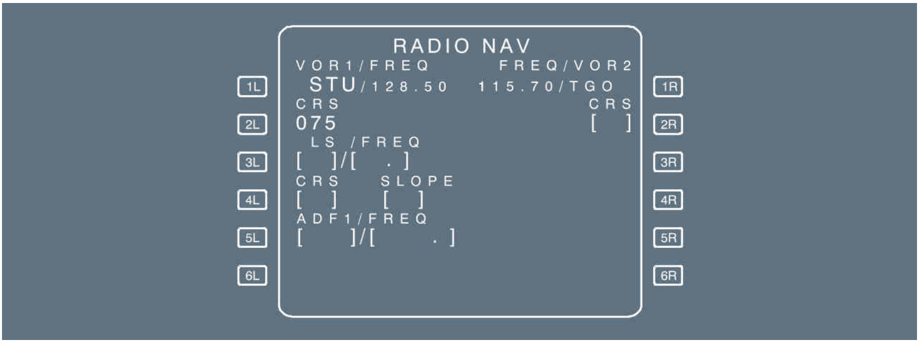
- **If the MCDU displays "NOT IN DATA BASE":**
  - WRITE the frequency.
  - DISREGARD the ident that comes up in small font on the MCDU.
    When a frequency is entered in the VOR field, the FMGEC automatically associates the tuned frequency to the closest navaid identifier with the same frequency, and display it on the RAD NAV page. This identifier may not be corresponding to the tuned navaid.
    If the closest navaid found in the database is of a different type (e.g. VOR instead of VOR/DME), the flight crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).
  - ENTER the course.

  Note: *If the flight crew intends to manually tune an ILS that is not in the Navigation Database or to manually tune an ILS by its frequency (ident not entered), and if they do not enter the course, the flight crew will not be able to arm approach modes.*

MANUAL TUNING

Ident.: DSC-22_20-20-30-00011550.0029001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

WRITE the identifier on the RAD NAV page.
Preferably use the identifier.



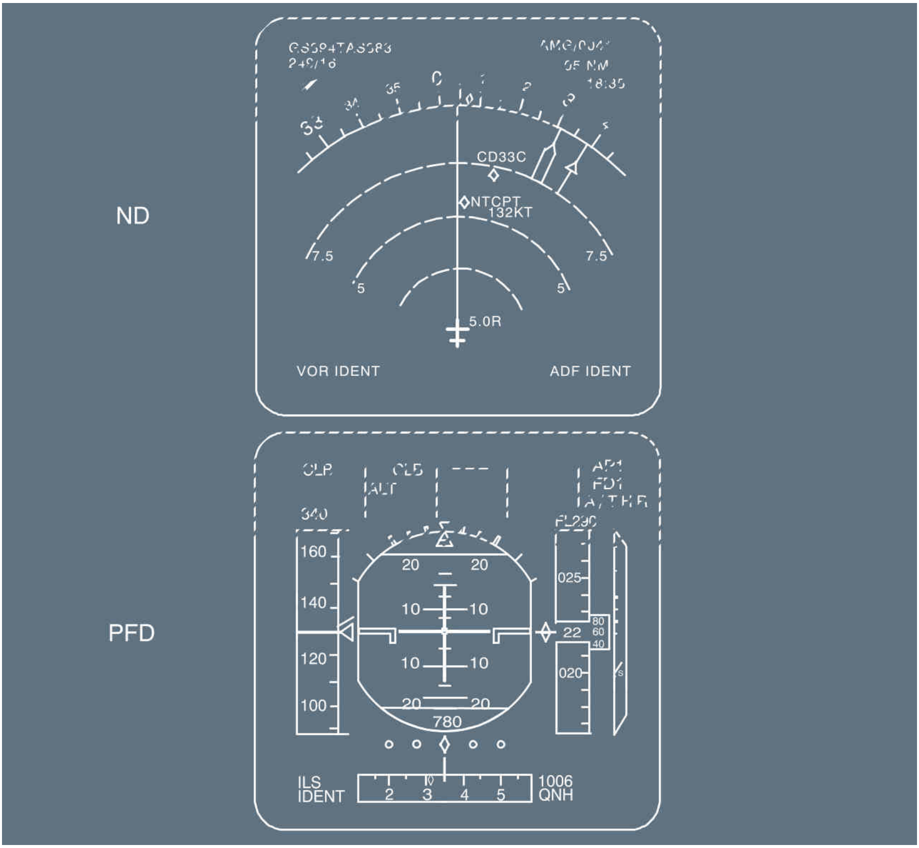
```
          RADIO NAV
 VOR1/FREQ          FREQ/VOR2
  STU/128.50     115.70/TGO
 CRS                      CRS
 075                      [  ]
   LS /FREQ
 [   ]/[   . ]
 CRS     SLOPE
 [   ]    [  ]
 ADF1/FREQ
 [     ]/[      . ]
```

- **If the MCDU displays "NOT IN DATA BASE":**
  - WRITE the frequency.
  - DISREGARD the ident that comes up in small font on the MCDU.
    When a frequency is entered in the VOR field, the FMGEC automatically associates the tuned frequency to the closest navaid identifier with the same frequency, and display it on the RAD NAV page. This identifier may not be corresponding to the tuned navaid.
    If the closest navaid found in the database is of a different type (e.g. VOR instead of VOR/DME), the flight crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).
  - ENTER the course.

NAVAID IDENTIFICATION

Ident.: DSC-22_20-20-30-00011551.0001001 / 14 MAY 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

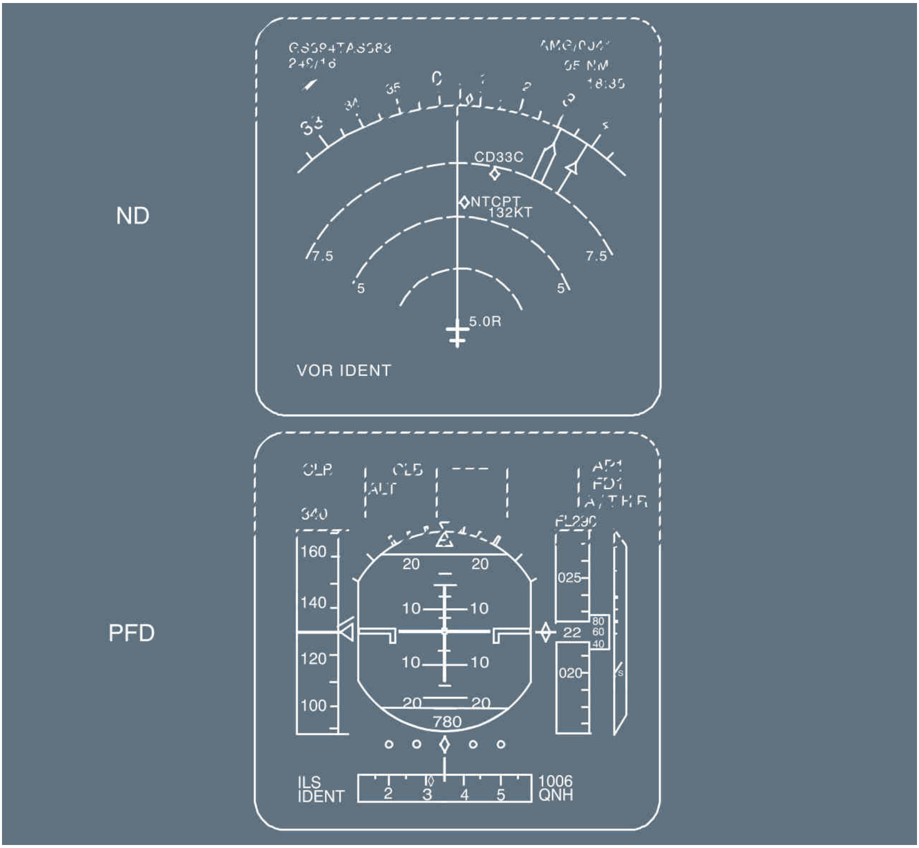
CHECK the decoding of the ILS identifier on PFD and the VOR or ADF identifier on ND.
When the navaid identifier is decoded in agreement with that published, no audio check is necessary.
When the decoding is different from the published one, check the audio. Due to Morse coding inaccuracy, wrong decoding may sometimes occur.


ND
PFD
249/18
05 NM
18:35
CD33C
NTCPT
132KT
7.5
7.5
5
5
5.0R
VOR IDENT
ADF IDENT
CLB
CLB
ALT
340
AP1
FD1
A/THR
FL290
160
140
120
100
20
20
10
10
10
10
20
20
025
22
020
80
60
40
780
ILS
IDENT
2
3
4
5
1006
QNH

NAVAID IDENTIFICATION

Ident.: DSC-22_20-20-30-00011551.0005001 / 14 MAY 12
Applicable to: LV-KHT, LV-KHU

CHECK the decoding of the ILS identifier on PFD and the VOR identifier on ND.
When the navaid identifier is decoded in agreement with that published, no audio check is necessary.
When the decoding is different from the published one, check the audio. Due to Morse coding inaccuracy, wrong decoding may sometimes occur.

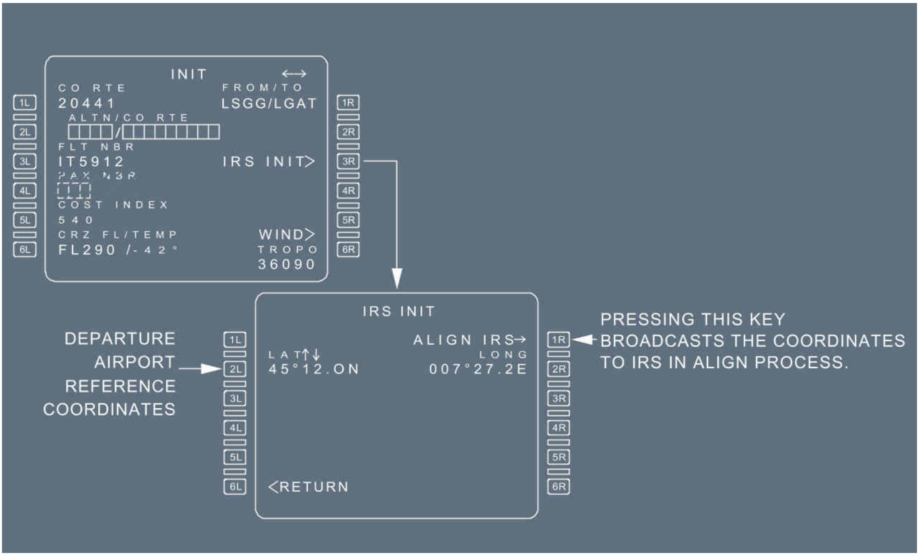

ND
PFD
GS394TAS383
249/16
AMG/004
95 NM
18:35
CD33C
NTCPT
132KT
7.5
5
5.0R
VOR IDENT
CLB
CL5
ALT
AP1
FD1
A/THR
340
FL290
160
140
120
100
20
10
780
025
22
020
80
60
40
ILS
IDENT
2
3
4
5
1006
QNH

Intentionally left blank

ALIGNMENT OF INERTIAL REFERENCE SYSTEM

Ident.: DSC-22_20-20-40-00011552.0003001 / 18 AUG 10
Applicable to: LV-KHT, LV-KHU

The FMGES uses the reference point coordinates of the departure airport to align the IRS.
It automatically calls these up from the database after the flight crew has entered a company route or an origin-destination city pair and pressed the ALIGN IRS key on the MCDU. The flight crew can manually adjust these coordinates to the gate position. A normal alignment takes 10 min, a fast alignment takes 30 s.
A fast alignment is used to refine a position when time is limited.



CO RTE
20441
FROM/TO
LSGG/LGAT
ALTN/CO RTE
FLT NBR
IT5912
PAX NBR
COST INDEX
540
CRZ FL/TEMP
FL290 /-42°
TROPO
36090

LAT↑↓
45°12.0N
LONG
007°27.2E

DEPARTURE AIRPORT REFERENCE COORDINATES

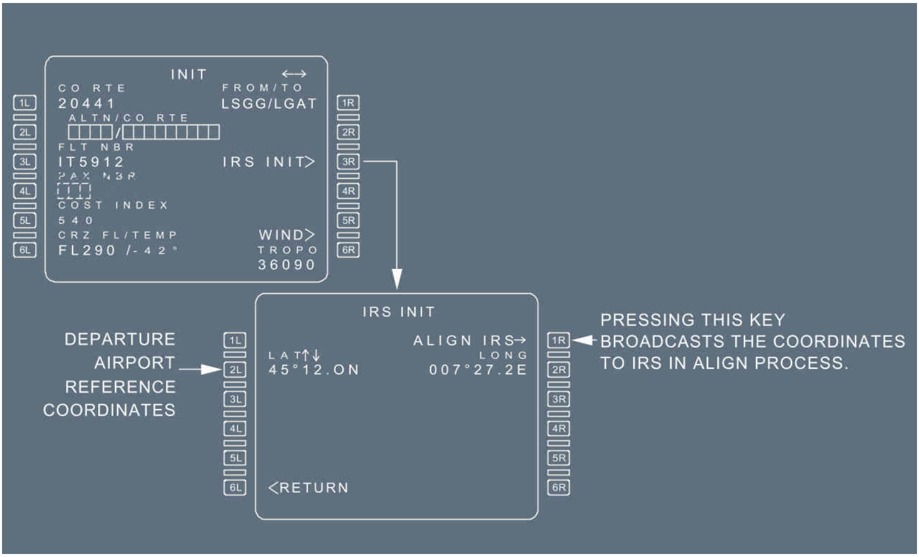
PRESSING THIS KEY BROADCASTS THE COORDINATES TO IRS IN ALIGN PROCESS.

Note: *If the "IRS IN ALIGN" memo flashes during the alignment, this indicates that:*
- *It has detected excessive motion (it automatically restarts the alignment), or*
- *It has detected a mismatch between the position the MCDU has sent to the IRS and the last memorized IRS position, or*
- *It has detected a mismatch between the latitude the flight crew has entered (which is sent by the MCDU to the IRS) and the latitude the IRS has computed during the alignment.*

ALIGNMENT OF INERTIAL REFERENCE SYSTEM

Ident.: DSC-22_20-20-40-00011552.0008001 / 18 AUG 10
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The preferred way of initializing the ADIRS is to use the GPS position, because this does not require any flight crew intervention. Less than 1 min after setting the ADIRS to NAV, the INIT page displays the GPS position without displaying the ALIGN IRS prompt.
If the flight crew enters a CO RTE or FROM/TO, the INIT page displays the departure airport reference-point coordinates, and the ALIGN IRS prompt appears. If this prompt key is not pressed, the ADIRS is initialized to the GPS position at the end of the alignment time.
At any time during the alignment, the flight crew can manually adjust the coordinates displayed on the INIT page. The ALIGN IRS prompt reappears.
If the ALIGN IRS prompt key is pressed, the coordinates displayed on the INIT page are sent to the ADIRS for initialization. This is the alternate method for ADIRS initialization, when the GPS position is not available.
A normal alignment takes between 5 and 10 min (depending on the local latitude). At latitudes between 73° and 82° (North or South), the alignment takes about 17 min. The ADIRS cannot be aligned beyond 82° (North or South).
A fast alignment takes about 30 s, and it is used for improving the ADIRS initial position accuracy, when time is limited.

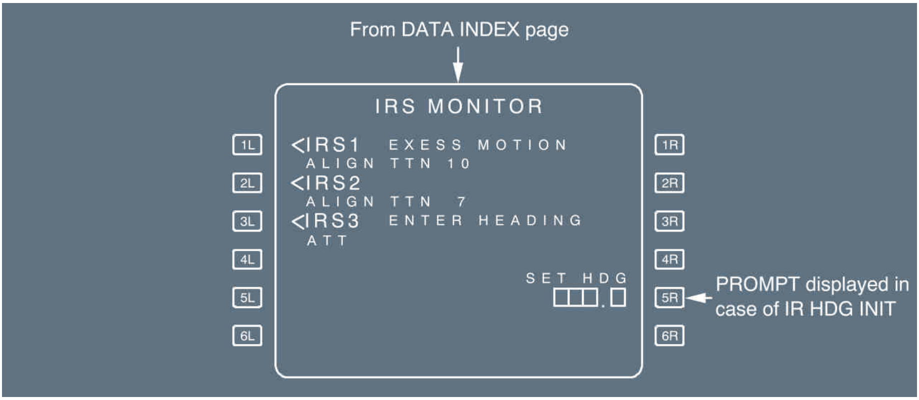

INIT
CO RTE
20441
FROM/TO
LSGG/LGAT
ALTN/CO RTE
FLT NBR
IT5912
IRS INIT>
PAX NBR
COST INDEX
540
CRZ FL/TEMP
FL290 /-42°
WIND>
TROPO
36090
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
IRS INIT
ALIGN IRS→
LAT↑↓
45°12.0N
LONG
007°27.2E
<RETURN
DEPARTURE
AIRPORT
REFERENCE
COORDINATES
PRESSING THIS KEY
BROADCASTS THE COORDINATES
TO IRS IN ALIGN PROCESS.

Note: *If the "IRS IN ALIGN" memo flashes during the alignment, this indicates that:*
- *It has detected excessive motion (it automatically restarts the alignment), or*
- *It has detected a mismatch between the position the MCDU has sent to the IRS and the last memorized IRS position, or*
- *It has detected a mismatch between the GPS position and the position entered by the flight crew, or*
- *It has detected a mismatch between the latitude the flight crew has entered (which is sent by the MCDU to the IRS) or the GPS latitude and the latitude the IRS has computed during the alignment.*

IR IN ATT MODE: HDG SET

Ident.: DSC-22_20-20-40-00011553.0001001 / 01 OCT 12
Applicable to: ALL

When one IRS at least is in ATT mode, the flight crew must set and periodically update the heading to have an attitude information. The entry is performed on the MCDU IRS MONITOR page.



From DATA INDEX page

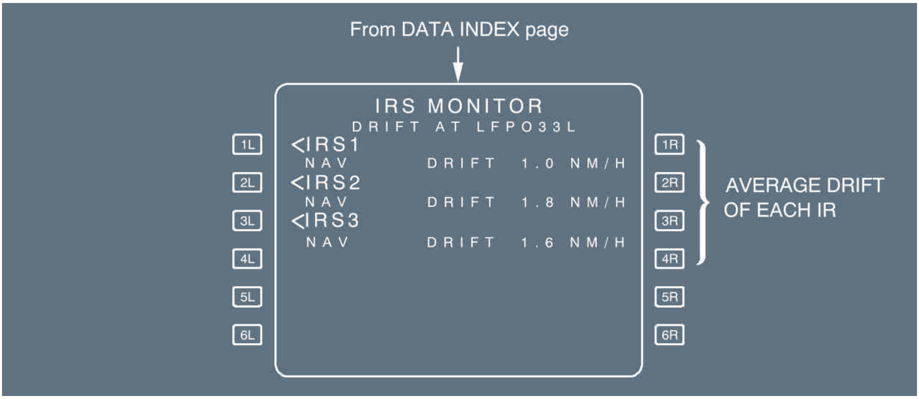
IRS MONITOR
<IRS1 EXCESS MOTION
ALIGN TTN 10
<IRS2
ALIGN TTN 7
<IRS3 ENTER HEADING
ATT
SET HDG
□□□.□

PROMPT displayed in case of IR HDG INIT

AVERAGE DRIFT COMPUTATION

Ident.: DSC-22_20-20-40-00012127.0001001 / 01 OCT 12
Applicable to: ALL

The FMGEC computes an average drift on the ground at the end of the flight for each IR. This drift is then displayed on the IRS page.
The drift is the difference between the IR position at landing and the geographic landing position (destination runway threshold plus a shift of 400 m).



```
        IRS MONITOR
      DRIFT AT LFPO33L
<IRS1
 NAV          DRIFT  1.0 NM/H
<IRS2
 NAV          DRIFT  1.8 NM/H
<IRS3
 NAV          DRIFT  1.6 NM/H
```

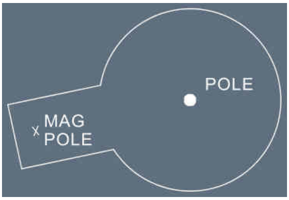
The FMGEC then computes the time since last alignment.

POLAR NAVIGATION

Ident.: DSC-22_20-20-40-00011554.0001001 / 27 MAY 13
Applicable to: LV-KHT, LV-KHU

The IRS can provide the MAG HEADING between latitudes 82°N and 60°S, except in the vicinity of North magnetic pole.
The FMGEC computes the aircraft position within polar area even at the North pole by using the MIX IRS position.

Note: *The IRS may be aligned up to latitude 73°N, without using a specific procedure. Between 73° and 82° (North or South), the required alignment time is longer and a specific procedure has to be performed. Beyond 82° North or South, no ADIRS alignment is possible.*



As a general rule, the MCDU displays all parameters referenced to North, depending on the position of the NORTH REF pb-sw.

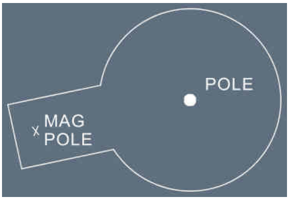
In order to provide the SAFEST and most FLEXIBLE operation, a MAG/TRUE NORTH REF pb-sw is available, with various messages provided on the EFIS ND, the MCDU, and the ECAM, indicating to the flight crew what reference should be applicable in the flight area the aircraft is located.

POLAR NAVIGATION

Ident.: DSC-22_20-20-40-00011554.0002001 / 27 MAY 13
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The IRS can provide the MAG HEADING between latitudes 82°N and 60°S, except in the vicinity of North magnetic pole.
The FMGEC computes the aircraft position within polar area even at the North pole by using the MIX IRS position.

Note: *The IRS may be aligned up to latitude 73°N, without using a specific procedure. Between 73° and 82° (North or South), the required alignment time is longer. Beyond 82° North or South, no ADIRS alignment is possible.*



As a general rule, the MCDU displays all parameters referenced to North, depending on the position of the NORTH REF pb-sw.
In order to provide the SAFEST and most FLEXIBLE operation, a MAG/TRUE NORTH REF pb-sw is available, with various messages provided on the EFIS ND, the MCDU, and the ECAM, indicating to the flight crew what reference should be applicable in the flight area the aircraft is located.

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GENERAL

Ident.: DSC-22_20-20-50-00012129.0001001 / 09 MAR 15
Applicable to: ALL

Overall navigation performance is mainly based on two elements:
- The accuracy of the aircraft position calculation
- The validity of the flight path definition, as extracted from the navigation database.

The level of validation depends on the type of operations. For example, JAA TGL 10 requires that, for Precision RNAV in terminal area, providers and operators implement a quality assurance program for the navigation database, which may include a navigation database validation process. The highest level of validation is required for RNAV approach, with lateral and vertical navigation.
The navigation databases are revised every 28 days (AIRAC cycle). Flights should be conducted with a navigation database that is within its cycle. This should be checked on the AIRCRAFT STATUS MCDU PAGE.

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FLIGHT PLANNING

Ident.: DSC-22_20-30-05-00012128.0001001 / 18 AUG 10
Applicable to: ALL

The flight crew uses the MCDU to insert flight plans into the FMGES:
- A lateral flight plan that defines the intended horizontal flight path
- A vertical flight plan that defines the intended speed and altitude profile for the aircraft to follow while flying the lateral flight plan.

Note: The flight planning function is available for both the primary and secondary flight plans.

The FMGES can contain two different flight plans:
- The ACTIVE flight plan, which is the basis for:
  - Lateral and vertical guidance
  - MCDU and ND display
  - Radio navigation autotuning
  - Performance predictions
  - Fuel planning.
- The SECONDARY flight plan which the flight crew may use:
  - To prepare and store a second departure procedure before takeoff
  - To plan a diversion
  - To prepare the next flight leg
  - To compare predictions or evaluations.

Each flight plan is composed of the same elements:
- The primary flight plan, from origin to destination and missed approach
- The alternate flight plan, from destination to alternate destination.

The flight crew enters the flight plan in either of two ways:
- Automatically by selecting a company route. Such a selection will call all the elements of the route out of the database.
- Manually by selecting an ORIGIN/DEST pair, and then selecting all successive waypoints, procedures, and vertical constraints on the MCDU.

The flight crew may then modify the flight plan on the ground or in flight, by making lateral and vertical revisions.

Intentionally left blank

General

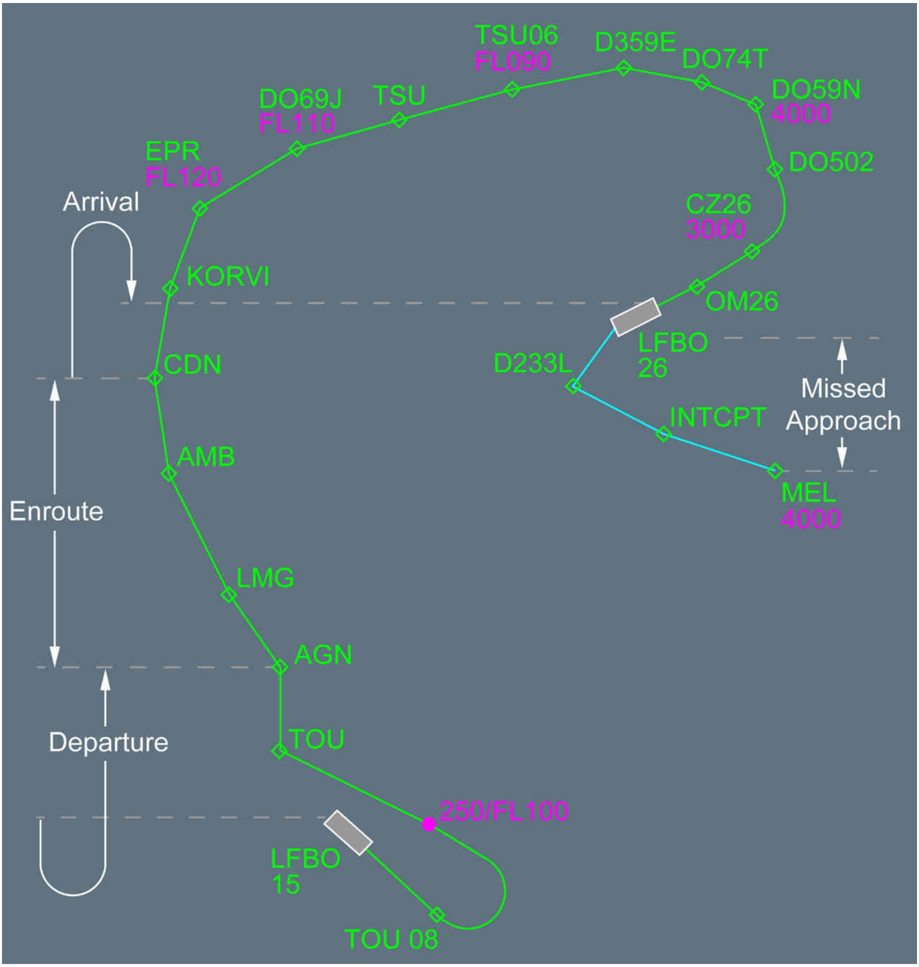
GENERAL

Ident.: DSC-22_20-30-10-05-00011404.0003001 / 05 MAR 19
Applicable to: ALL

To insert the lateral flight plan, the flight crew can use either a company route number or an ICAO four-letter city pair. The lateral flight plan includes the following elements:

- Departure
  - Takeoff runway
  - SID
  - En route transition.
- En route
  - En route waypoints and airways.
- Arrival
  - En route transition
  - STARs/VIAs
  - Landing runway with selected approach
  - Missed approach.
- Alternate flight plan.

These elements are defined by waypoints and legs between the waypoints.

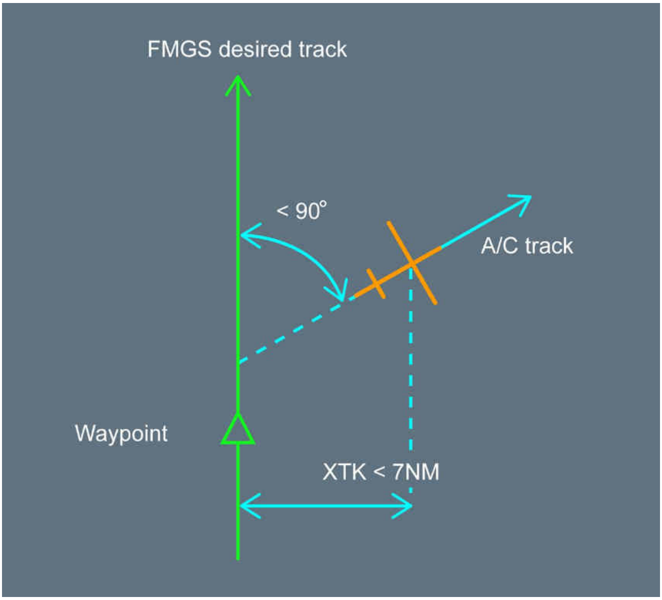

TSU06
FL090
D359E
DO74T
DO59N
4000
DO69J
FL110
TSU
EPR
FL120
DO502
Arrival
CZ26
3000
KORVI
OM26
LFBO
26
CDN
D233L
Missed
Approach
INTCPT
AMB
MEL
4000
Enroute
LMG
AGN
Departure
TOU
250/FL100
LFBO
15
TOU 08

The FMGEC strings the legs in sequence automatically.
The flight plan has a discontinuity if any two waypoints do not have a leg defined between them.
The computer assumes that the aircraft will fly a direct leg between the two waypoints that define the discontinuity.

Note: *When the aircraft enters a flight plan discontinuity, the NAV mode automatically switches to the HDG/TRK mode.*

In HDG/TRK mode, a flight plan waypoint is sequenced if the following conditions are met:

- The waypoint is behind the aircraft and the aircraft is less than 7 NM from it
- The angle between the current aircraft track and the track of the leg is less than 90 °.



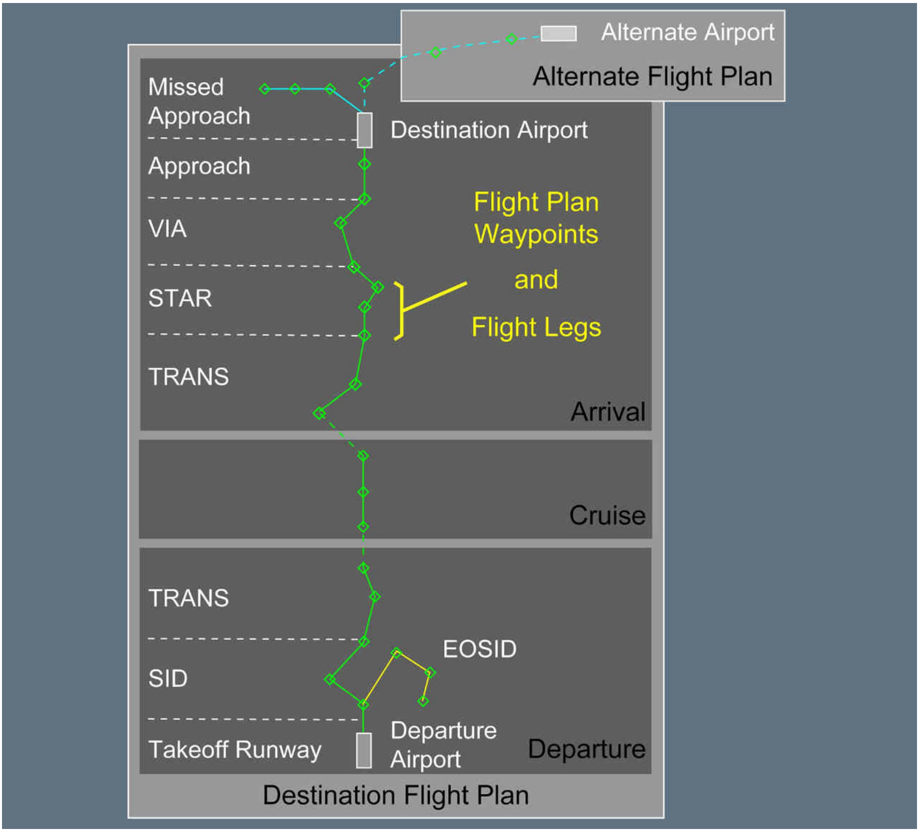
Note: *If the flight crew revises the lateral flight plan with the DIR TO INTERCEPT function, the waypoints of the revised flight plan are sequenced when the aircraft is in the above mentioned conditions.*

The FMGES automatically strings additional types of legs when departure or arrival procedures (SID-STAR-TRANS) are defined.

Some of these legs are specific legs, such as:
- DME arc leg
- Holding pattern to a fix or reverse turn
- Course-to-fix leg
- Radius-to-fix leg
- Heading leg
- MANUAL leg.

The flight crew cannot create these types of legs: They are part of the stored departure/arrival procedures they have selected.

The flight crew can create only direct legs between manually defined geographic points (navaids, airports, waypoints).


Alternate Airport
Alternate Flight Plan
Missed Approach
Destination Airport
Approach
Flight Plan Waypoints and Flight Legs
VIA
STAR
TRANS
Arrival
Cruise
TRANS
EOSID
SID
Takeoff Runway
Departure Airport
Departure
Destination Flight Plan

<u>Note:</u> *The departure and arrival procedures are defined in the database to minimize the amount of memory required.*

They are divided as follows:
- *DEPARTURE = SID + EN ROUTE TRANSITION*
- *ARRIVAL = APPR VIA + STAR + EN ROUTE TRANSITION*

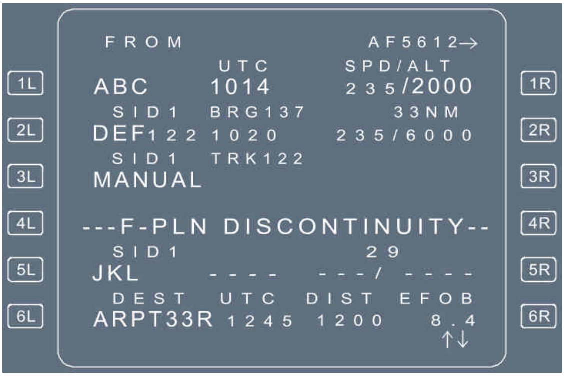
The SID is the central common part of the departure procedure, as the STAR is of the arrival procedure. En route transitions (TRANS) are the various possible trajectories defined between the last point of the SID and the first en route waypoints and between the last en route waypoint and the first fix of the STAR. "APPR VIAs" are the possible trajectories defined between the last point of the STAR and the first point of the approach.

MANUAL LEGS

Ident.: DSC-22_20-30-10-05-00011405.0001001 / 18 AUG 10
Applicable to: ALL

A MANUAL leg stays on a constant TRK or HDG and has no termination point. The flight crew cannot insert it into a flight plan manually: it is part of a given procedure such as a SID or a STAR. When the aircraft is flying a MANUAL leg, the NAV mode remains engaged and predictions assume that the aircraft will fly a direct leg from its present position to the next waypoint (DIR TO). When the aircraft is cleared to fly to the next waypoint of the flight plan, the flight crew performs a DIR TO.

<u>Note:</u> *1. In NAV mode, a MANUAL leg is sequenced only by performing a DIR TO.*
2. The use of the descent mode (DES) on a MANUAL leg is not recommended.



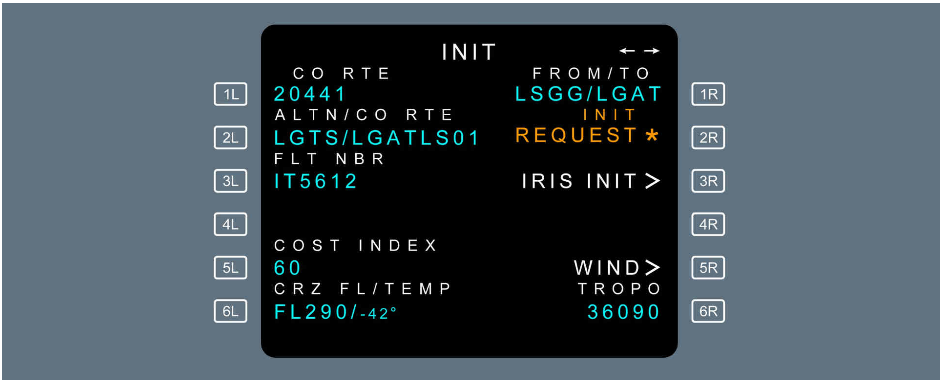
```
  FROM                     AF5612→
           UTC          SPD/ALT
 ABC       1014         235/2000
   SID1    BRG137          33NM
 DEF122    1020         235/6000
   SID1    TRK122
 MANUAL

---F-PLN DISCONTINUITY--
   SID1                   29
 JKL       ----       ---/ ----
   DEST    UTC    DIST    EFOB
 ARPT33R   1245   1200     8.4
                            ↑↓
```

FLIGHT PLAN CONSTRUCTION

Ident.: DSC-22_20-30-10-05-00011406.0003001 / 04 JUN 19
Applicable to: LV-GKO, LV-GKP

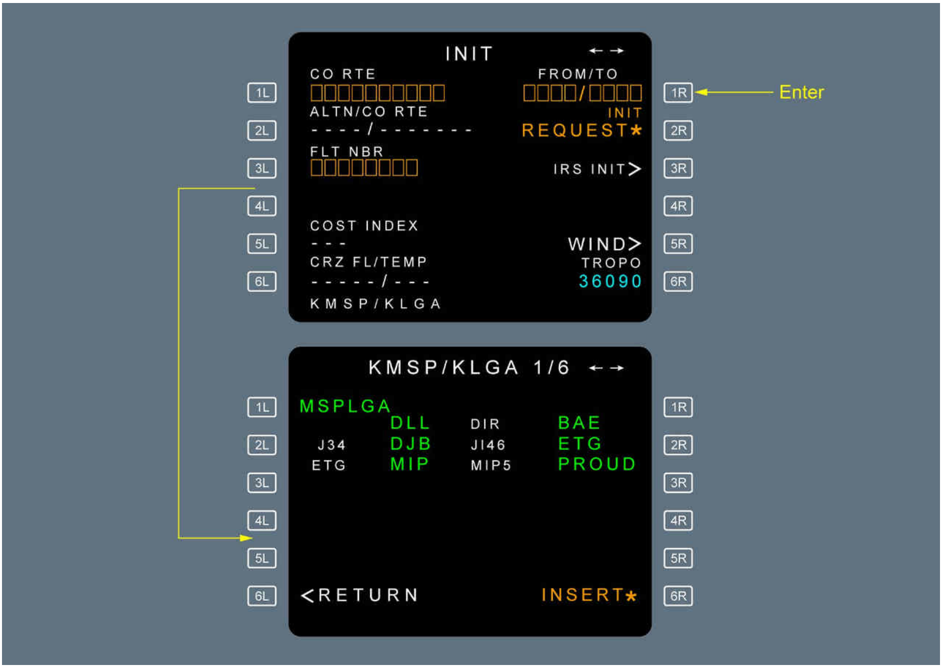
There are three ways to define the route:

1. A company route, that is in the database, and is known by the flight crew.
   The flight crew enters the name of the CO RTE into the [1L] field of the INIT A page, and this action enters all the elements of the flight plan. The database usually includes an alternate route associated with the destination.



```
              INIT                 ← →
  CO RTE                    FROM/TO
20441                     LSGG/LGAT
ALTN/CO RTE                    INIT
LGTS/LGATLS01             REQUEST*
FLT NBR
IT5612                    IRIS INIT>

COST INDEX
60                            WIND>
CRZ FL/TEMP                   TROPO
FL290/-42°                    36090
```

2. A company route, that is in the database, but the flight crew does not know it is there.
   The flight crew enters a city pair in the [1R] field. The ROUTE SELECTION page automatically appears and enables the flight crew to review all stored routes between the two cities before selecting one of them.



INIT ←→
CO RTE ☐☐☐☐☐☐☐☐☐☐ FROM/TO ☐☐☐☐/☐☐☐☐
ALTN/CO RTE ----/------- INIT REQUEST*
FLT NBR ☐☐☐☐☐☐☐☐ IRS INIT>
COST INDEX --- WIND>
CRZ FL/TEMP -----/--- TROPO 36090
KMSP/KLGA

KMSP/KLGA 1/6 ←→
MSPLGA
DLL DIR BAE
J34 DJB J146 ETG
ETG MIP MIP5 PROUD
<RETURN INSERT*

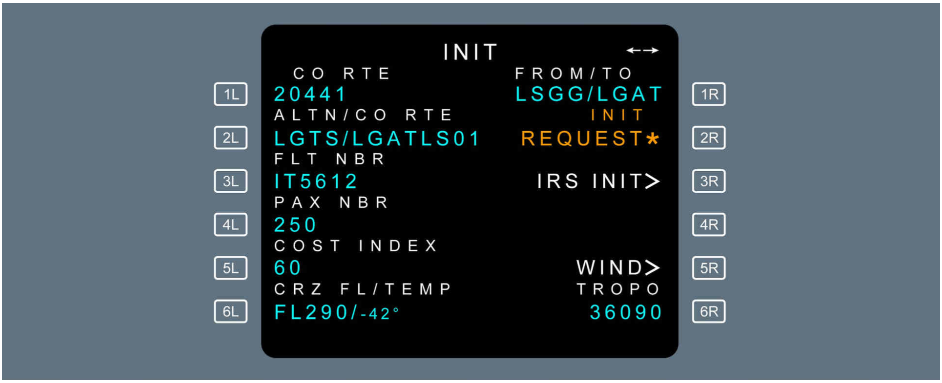
3. There is no company route between the two cities.
   The flight crew enters the city pair in the [1R] field. The ROUTE SELECTION page appears and displays “NONE”.
   The flight crew has to construct the entire flight plan manually.
   For procedure, *Refer to PRO-NOR-SRP-01-10 Flight Plan Initialization - General*.

FLIGHT PLAN CONSTRUCTION

Ident.: DSC-22_20-30-10-05-00011406.0007001 / 04 JUN 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

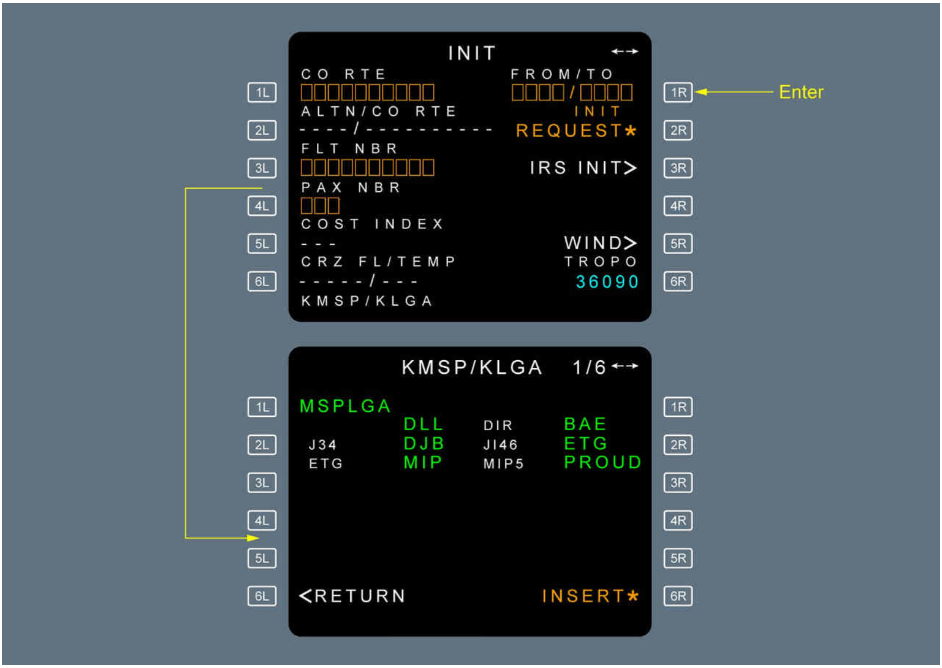
There are three ways to define the route:

1. A company route, that is in the database, and is known by the flight crew.
   The flight crew enters the name of the CO RTE into the [1L] field of the INIT A page, and this action enters all the elements of the flight plan. The database usually includes an alternate route associated with the destination.



```
           INIT                    ←→
  CO RTE                  FROM/TO
20441                   LSGG/LGAT
ALTN/CO RTE                  INIT
LGTS/LGATLS01           REQUEST*
FLT NBR
IT5612                 IRS INIT>
PAX NBR
250
COST INDEX
60                         WIND>
CRZ FL/TEMP                TROPO
FL290/-42°                 36090
```

2. A company route, that is in the database, but the flight crew does not know it is there. The flight crew enters a city pair in the [1R] field. The ROUTE SELECTION page automatically appears and enables the flight crew to review all stored routes between the two cities before selecting one of them.



INIT ←→
CO RTE | FROM/TO
□□□□□□□□□□ | □□□□/□□□□
ALTN/CO RTE | INIT
----/---------- | REQUEST*
FLT NBR
□□□□□□□□□□ | IRS INIT>
PAX NBR
□□□
COST INDEX
--- | WIND>
CRZ FL/TEMP | TROPO
-----/--- | 36090
KMSP/KLGA

KMSP/KLGA 1/6 ←→
MSPLGA
DLL DIR BAE
J34 DJB J146 ETG
ETG MIP MIP5 PROUD
<RETURN INSERT*

3. There is no company route between the two cities.
   The flight crew enters the city pair in the [1R] field. “NONE” automatically appears in the CO ROUTE [1L] field, without automatically displaying the ROUTE SELECTION page.
   The flight crew has to construct the entire flight plan manually.
   For procedure, *Refer to PRO-NOR-SRP-01-10 Flight Plan Initialization - General*.

FLIGHT PLAN CAPACITY

Ident.: DSC-22_20-30-10-05-00011407.0003001 / 04 NOV 20
Applicable to: ALL

In terms of flight plan capacity, the FMS takes into account 3 flight plans:
- The active flight plan
- The secondary flight plan
- The temporary flight plan.

Each flight plan can contain up to 200 legs. If a flight plan contains 200 legs, and if the flight crew attempts to perform a lateral revision that increases the number of legs of this flight plan, the FMS rejects the revision and the MCDU displays the F-PLN FULL message.

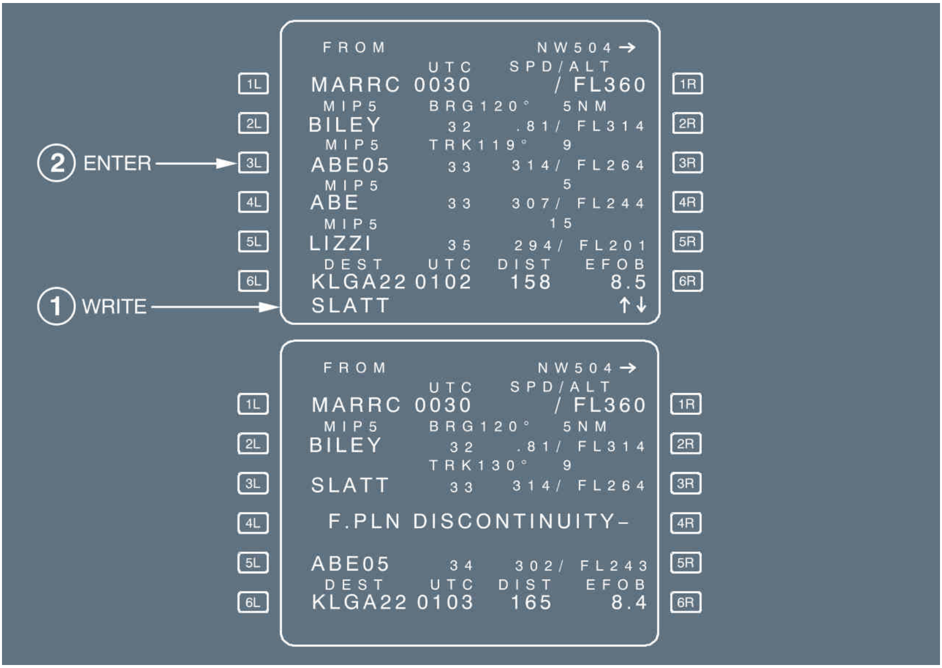
For the active and secondary flight plans, the primary parts must contain less than 165 legs, and the alternate parts must contain less than 35 legs.

LATERAL REVISIONS

Ident.: DSC-22_20-30-10-05-00011408.0003001 / 14 MAY 12
Applicable to: ALL

The flight crew can revise the lateral flight plan following two types of revisions:

1. Lateral revisions that have an immediate effect on the active flight plan:
   - The flight crew inserts a new waypoint directly on the F-PLN page, deletes or changes a waypoint from it.

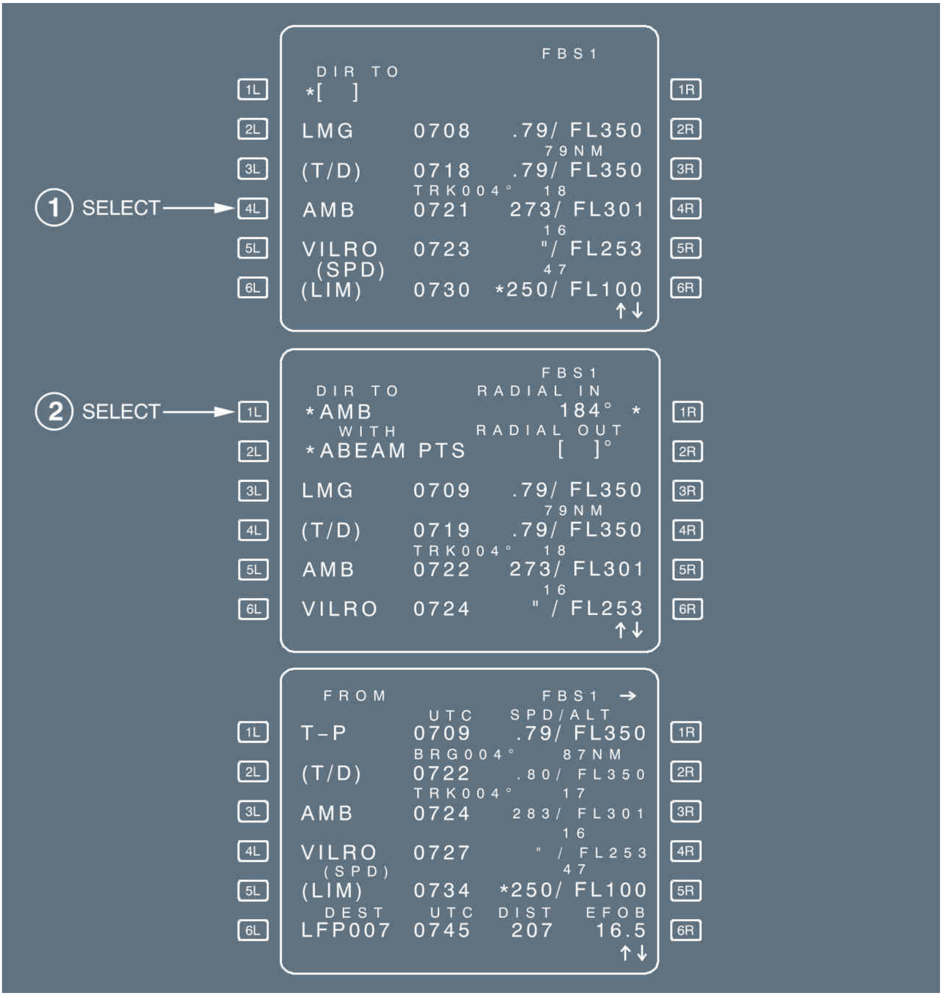


```
 FROM                        NW504→
              UTC      SPD/ALT
MARRC  0030              / FL360
 MIP5        BRG120°     5NM
BILEY          32      .81/ FL314
 MIP5        TRK119°     9
ABE05          33      314/ FL264
 MIP5                    5
ABE            33      307/ FL244
 MIP5                    15
LIZZI          35      294/ FL201
 DEST        UTC    DIST    EFOB
KLGA22 0102         158      8.5
SLATT                          ↑↓
```

```
 FROM                        NW504→
              UTC      SPD/ALT
MARRC  0030              / FL360
 MIP5        BRG120°     5NM
BILEY          32      .81/ FL314
             TRK130°     9
SLATT          33      314/ FL264
   F.PLN DISCONTINUITY-

ABE05          34      302/ FL243
 DEST        UTC    DIST    EFOB
KLGA22 0103         165      8.4
```

When the flight crew enters a new waypoint that does not exists in the flight plan, the following waypoint moves down the flight plan, with a discontinuity shown after the new waypoint.

   - The flight crew adds a direct leg (DIR TO) from his present position to a selected waypoint. The flight crew can change the “TO” waypoint of the active leg. The DIR TO function gives access to DIR TO, DIR TO ABEAM or DIR TO/INTERCEPT. The active leg then goes from the present position (T/P) to the waypoint selected or inserted as the new “TO” waypoint.



```
                         FBS1
 DIR TO
*[   ]
LMG        0708    .79/ FL350
                     79NM
(T/D)      0718    .79/ FL350
           TRK004°   18
AMB        0721    273/ FL301
                     16
VILRO      0723      "/ FL253
 (SPD)               47
(LIM)      0730   *250/ FL100
                           ↑↓
```

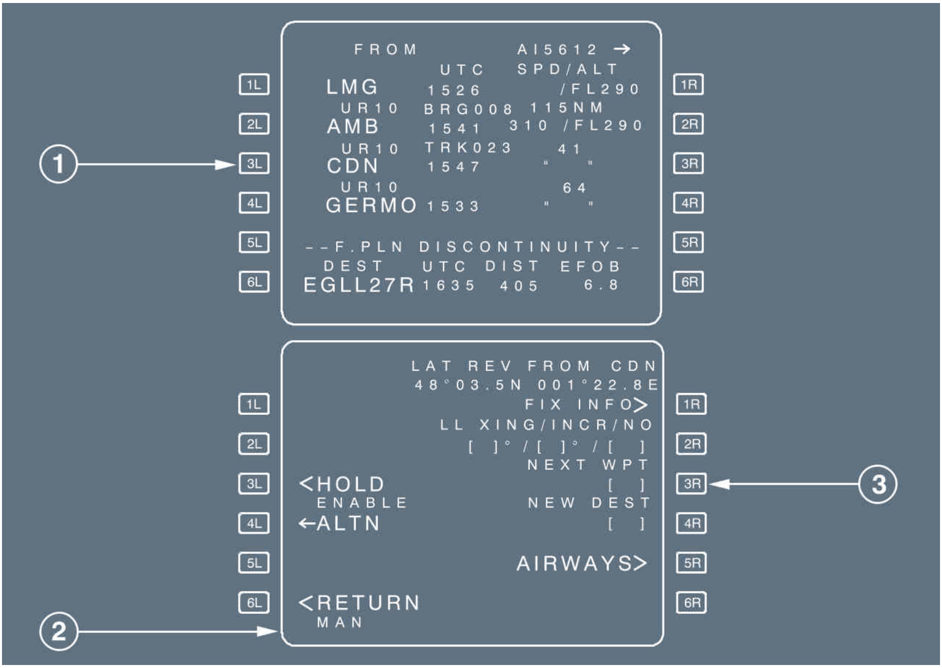
```
                         FBS1
 DIR TO            RADIAL IN
*AMB                  184°  *
  WITH             RADIAL OUT
*ABEAM PTS            [   ]°
LMG        0709    .79/ FL350
                     79NM
(T/D)      0719    .79/ FL350
           TRK004°   18
AMB        0722    273/ FL301
                     16
VILRO      0724     " / FL253
                           ↑↓
```

```
  FROM                   FBS1  →
            UTC     SPD/ALT
T-P        0709     .79/ FL350
           BRG004°    87NM
(T/D)      0722     .80/ FL350
           TRK004°    17
AMB        0724     283/ FL301
                      16
VILRO      0727      "  / FL253
 (SPD)                47
(LIM)      0734    *250/ FL100
  DEST      UTC    DIST    EFOB
LFP007     0745    207     16.5
                           ↑↓
```

2. Lateral revisions that lead to a temporary flight plan (TMPY) before they take effect:
   The flight crew creates a temporary flight plan then inserts it as a revision to the active flight plan. The flight crew does this when selecting, deleting, or modifying several waypoints of an airway or procedure at once (SID, STAR, HOLD, TAKEOFF or LANDING RWY). This modification is made on specific "LAT REV" pages from the flight plan page.

Possible revisions are:
- Insert or modify departure procedure
- Insert or modify arrival procedure
- Insert a waypoint
- Change the destination
- Insert an airway
- Insert an offset
- Insert a holding pattern
- Select or enable an alternate flight plan
- Fix information.

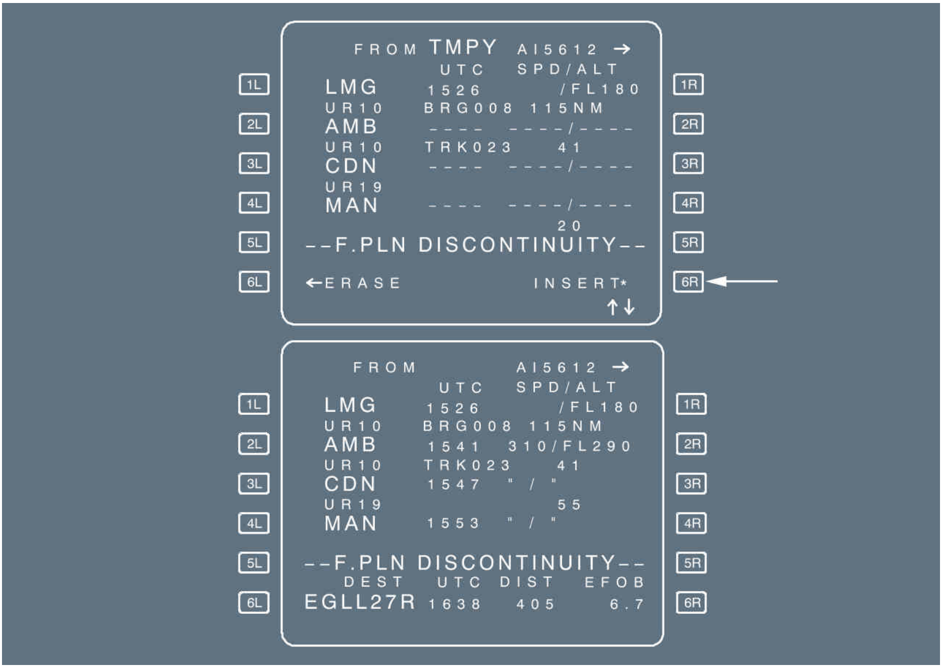
The purpose of the temporary flight plan is to allow the flight crew to review the revision on the MCDU and on the ND before inserting it into the active flight plan.
It is a copy of the active flight plan that has been changed according to the flight crew revision.
While it is displayed, the aircraft will continue to follow the original active flight plan.
No predictions are computed or displayed on the pages of the temporary flight plan.



```
   FROM              AI5612 →
           UTC     SPD/ALT
LMG        1526       /FL290
   UR10   BRG008  115NM
AMB        1541   310 /FL290
   UR10   TRK023     41
CDN        1547      "   "
   UR10              64
GERMO 1533           "   "

 --F.PLN DISCONTINUITY--
  DEST   UTC  DIST  EFOB
EGLL27R 1635  405    6.8
```

```
          LAT REV FROM CDN
          48°03.5N 001°22.8E
                   FIX INFO>
             LL XING/INCR/NO
             [ ]°/[ ]°/[  ]
                    NEXT WPT
<HOLD                  [  ]
  ENABLE            NEW DEST
←ALTN                  [  ]

                   AIRWAYS>

<RETURN
  MAN
```

A temporary revision is displayed for a check and/or new modification. Inserting it will modify the active flight plan.



```
        FROM TMPY    AI5612 →
               UTC   SPD/ALT
LMG            1526      /FL180
UR10           BRG008 115NM
AMB            ----  ----/----
UR10           TRK023    41
CDN            ----  ----/----
UR19
MAN            ----  ----/----
                         20
--F.PLN DISCONTINUITY--
←ERASE              INSERT*
                         ↑↓
```

```
        FROM         AI5612 →
               UTC   SPD/ALT
LMG            1526      /FL180
UR10           BRG008 115NM
AMB            1541  310/FL290
UR10           TRK023    41
CDN            1547   " / "
UR19                     55
MAN            1553   " / "

--F.PLN DISCONTINUITY--
      DEST     UTC  DIST   EFOB
EGLL27R        1638  405    6.7
```

FMS2 Honeywell

GENERAL

Ident.: DSC-22_20-30-10-15-00009230.0001001 / 03 NOV 21
Applicable to: ALL

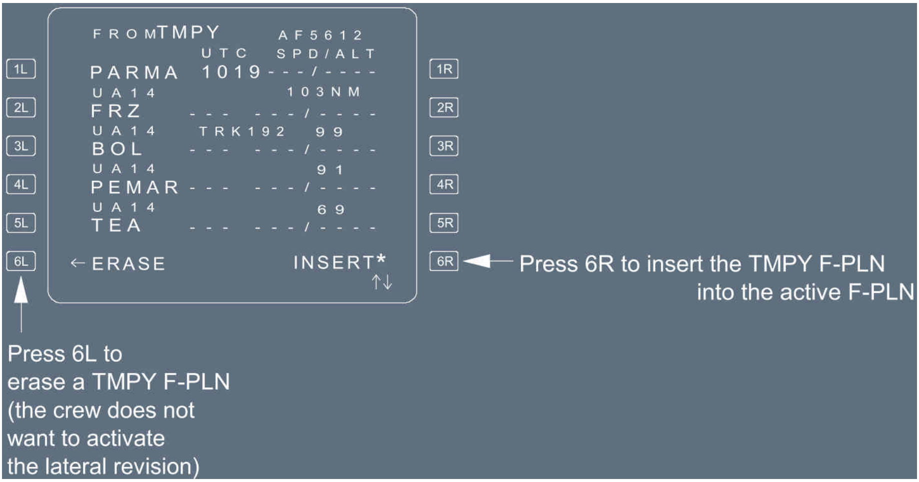
The lateral revision function allows the flight crew to create or modify the following parts of the flight plan:
- Airway
- Waypoint
- New destination
- Holding pattern
- Offset
- Alternate
- Fix information
  Each time the flight crew activates one of the revisions listed above, the flight crew accesses to a temporary flight plan that allows to check the modification before inserting it in the active flight plan. The flight crew selects these functions by pressing the left keys on F-PLN A or B.
- Direct to and overfly functions are accessed through MCDU keys. No temporary flight plan is created with these functions.
- “Update at” capability is a specific function that manually updates the FM position. It does not use a temporary flight plan, but the flight crew must confirm the insertion before it is activated.

TEMPORARY F-PLN (TMPY)

Ident.: DSC-22_20-30-10-15-00009231.0001001 / 15 FEB 11
Applicable to: ALL

When a pilot makes a lateral revision to the F-PLN, the FMGS creates a temporary flight plan. This is a copy of the active F-PLN, but is corrected by the lateral revision in progress.
The aircraft continues to follow the active F-PLN until the temporary revision is inserted.
The revision appears in yellow characters on both MCDUs and NDs.

- Lateral and vertical revisions cannot be made to a temporary F-PLN.
- Only one temporary F-PLN may be accessed at a time.
- The “DIRECT TO” function, when used, erases a temporary F-PLN.
- When a DIR TO is in process, a temporary revision cannot be displayed on the other MCDU.
- A TMPY F-PLN changes the title of the flight plan pages. (TMPY appears in all titles).
- No predictions are computed for a temporary flight plan (Dashes are displayed).



```
 FROMTMPY          AF5612
            UTC    SPD/ALT
PARMA      1019---/-----
 UA14              103NM
FRZ       ---   ---/-----
 UA14      TRK192    99
BOL       ---   ---/-----
 UA14                91
PEMAR---   ---/-----
 UA14                69
TEA       ---   ---/-----

←ERASE          INSERT*
                     ↑↓
```

Press 6R to insert the TMPY F-PLN into the active F-PLN

Press 6L to erase a TMPY F-PLN (the crew does not want to activate the lateral revision)

Temporary data are displayed in yellow (ND and MCDU). Once inserted they become active and are displayed in green.

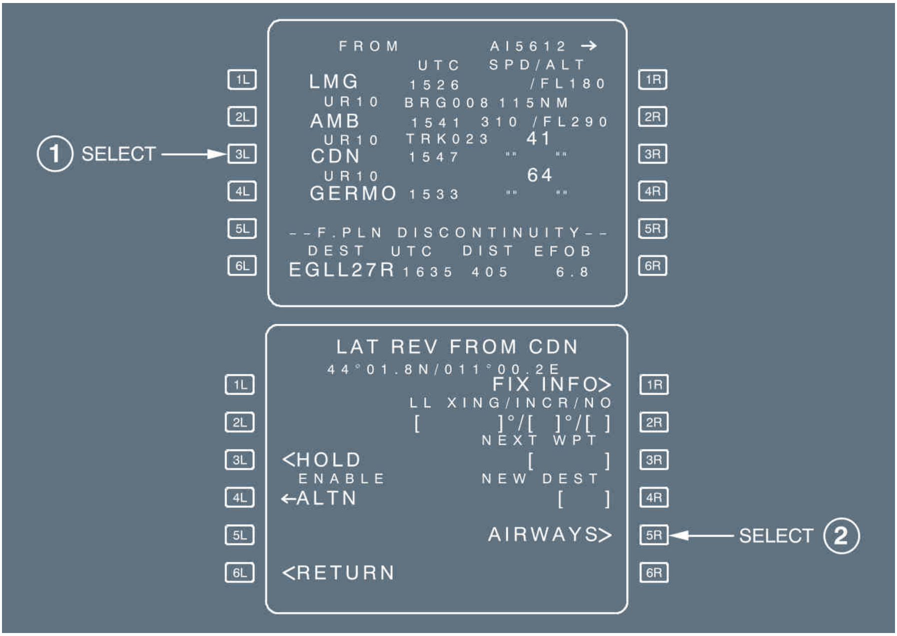
INSERTING AN AIRWAY WITH "VIA"

Applicable to: ALL

Ident.: DSC-22_20-30-10-15-A-00009232.0001001 / 14 MAY 12

GENERAL

The pilot can insert into the active flight plan, up to 5 successive airway segments going from a revised waypoint or ending at a given waypoint of the flight plan.



```
   FROM             AI5612 →
              UTC   SPD/ALT
 LMG         1526      /FL180
   UR10    BRG008 115NM
 AMB         1541   310 /FL290
   UR10    TRK023    41
 CDN         1547    "     "
   UR10              64
 GERMO       1533    "     "

--F.PLN DISCONTINUITY--
  DEST    UTC    DIST   EFOB
EGLL27R  1635    405    6.8
```

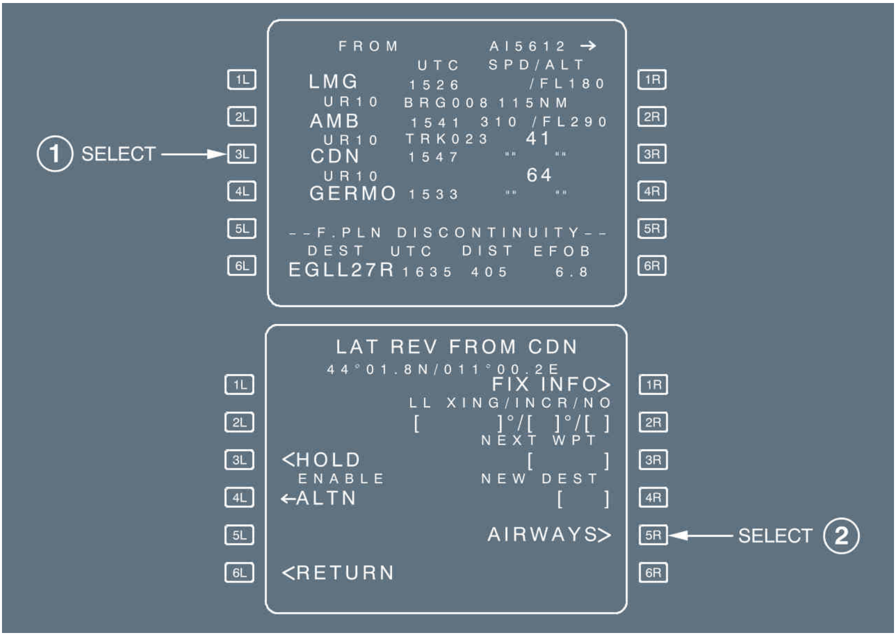
```
      LAT REV FROM CDN
   44°01.8N/011°00.2E
                 FIX INFO>
           LL XING/INCR/NO
           [     ]°/[  ]°/[ ]
                  NEXT WPT
<HOLD              [      ]
  ENABLE          NEW DEST
←ALTN                 [   ]

                 AIRWAYS>

<RETURN
```

SELECT the revised waypoint (here CDN).
PRESS [5R] to select the airways function.

Ident.: DSC-22_20-30-10-15-A-00009233.0001001 / 03 NOV 21

SUCCESSIVE AIRWAY SEGMENT FROM A WAYPOINT

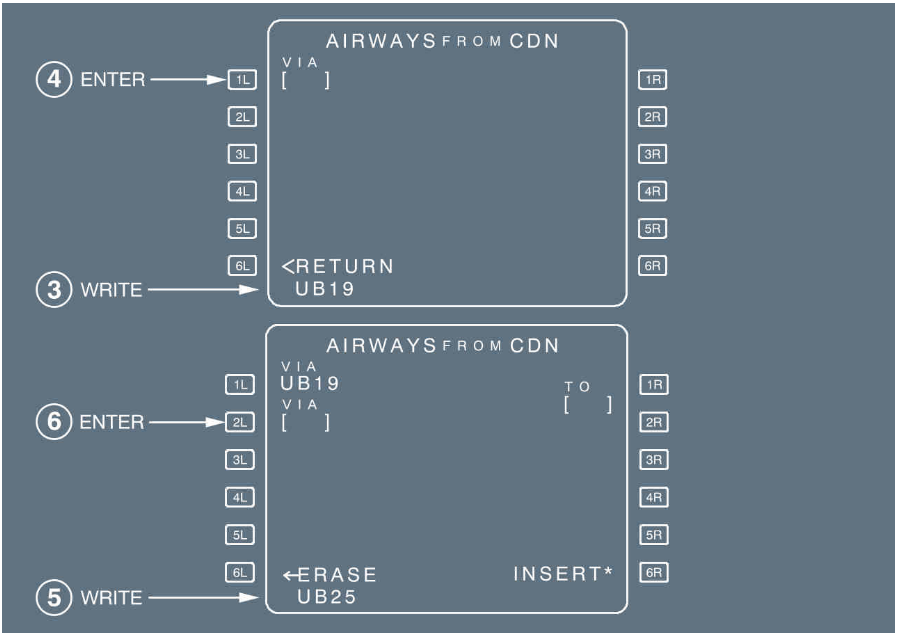
e.g. from CDN - Airways UB19 – Airways UB25 – Ending point AAA.



```
   FROM           AI5612 →
            UTC   SPD/ALT
 LMG       1526      /FL180
  UR10    BRG008 115NM
 AMB       1541  310 /FL290
  UR10    TRK023   41
 CDN       1547    "    "
  UR10              64
 GERMO     1533    "    "

 --F.PLN DISCONTINUITY--
  DEST  UTC   DIST  EFOB
 EGLL27R 1635  405    6.8
```

```
    LAT REV FROM CDN
   44°01.8N/011°00.2E
               FIX INFO>
         LL XING/INCR/NO
         [      ]°/[ ]°/[ ]
               NEXT WPT
<HOLD          [        ]
 ENABLE        NEW DEST
←ALTN              [    ]

                AIRWAYS>

<RETURN
```

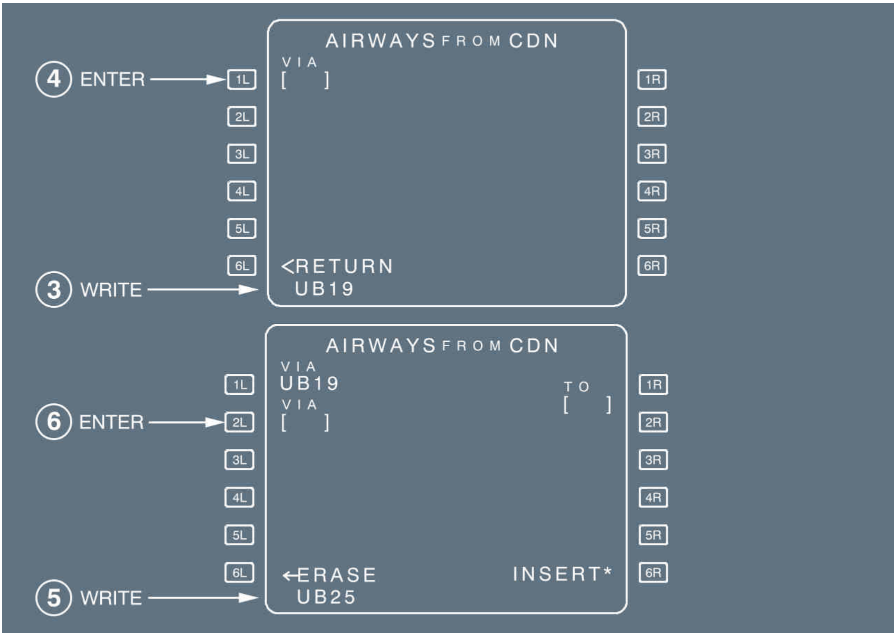
1L
2L
① SELECT
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
SELECT ②
6R


AIRWAYS FROM CDN
VIA
[ ]
<RETURN
UB19
④ ENTER
③ WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
AIRWAYS FROM CDN
VIA
UB19
TO
[ ]
VIA
[ ]
←ERASE
UB25
INSERT*
⑥ ENTER
⑤ WRITE

WRITE the first airway in the scratchpad (here UB19).
PRESS [1L] to insert into the VIA field.
WRITE the second airway in the scratchpad (here UB25)
PRESS [2L] to insert into the VIA field.

- If the airways have a common waypoint, the system selects it as the ending point of the first VIA.
- If they have no common waypoint but have a single intersection, the system creates this intersection as an FM computed point and displays X followed by the airway ident (here XUB25).
- If they have no common waypoint neither intersection, the system displays NO INTERSECTION FOUND in the scratchpad.

Once the flight crew has entered the required airways (up to 5), the flight crew must enter the ending point of the last selected airways:

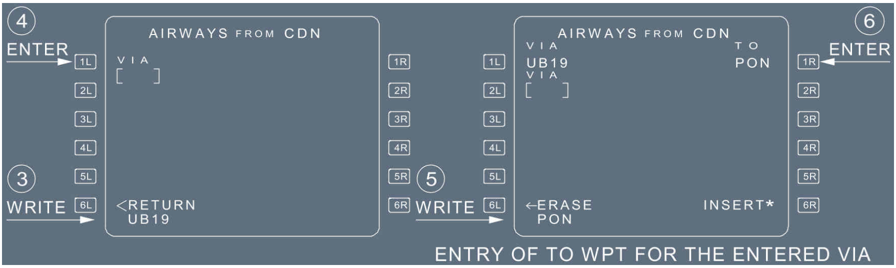

AIRWAYS FROM CDN
VIA
[ ]
<RETURN
UB19
4 ENTER
3 WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
AIRWAYS FROM CDN
VIA
UB19
TO
[ ]
VIA
[ ]
←ERASE
UB25
INSERT*
6 ENTER
5 WRITE

WRITE the ending waypoint in the scratchpad (here AAA).
PRESS [2R] to insert the ending waypoint into the TO field.

Note: *If two waypoints with the same ident belong to the same airway, the DUPLICATE NAMES page will not be called and the system selects the first one in the database.*

Ident.: DSC-22_20-30-10-15-A-00009234.0001001 / 15 FEB 11

ONE AIRWAY SEGMENT TO AN ENDING WAYPOINT


4
ENTER
3
WRITE
AIRWAYS FROM CDN
VIA
[ ]
<RETURN
UB19
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
5
WRITE
AIRWAYS FROM CDN
VIA
UB19
VIA
[ ]
TO
PON
←ERASE
PON
INSERT*
6
ENTER
ENTRY OF TO WPT FOR THE ENTERED VIA

WRITE the airway ident in the scratchpad (here UB19).

PRESS [1L] to insert into the VIA field.
WRITE the ending waypoint in the scratchpad (here PON).
PRESS [1R] to insert into the TO field.

Note:
- *If the revise waypoint or the ending waypoint does not belong to the entered airway, the system displays AWY/WPT MISMATCH in the scratchpad.*
- *If two waypoints with the same ident belong to the same airway, the DUPLICATE NAMES page will not be called and the system selects the first one in the database.*

Ident.: DSC-22_20-30-10-15-A-00009235.0001001 / 15 FEB 11

FLIGHT PLAN INSERTION

The flight crew inserts the flight plan either directly from the AIRWAYS page or from the TMPY F-PLN page. In both cases :

PRESS [6R] to insert the temporary flight plan. Clear the flight plan discontinuity as necessary.

INSERTING A WAYPOINT

Ident.: DSC-22_20-30-10-15-B-00009236.0001001 / 15 FEB 11
Applicable to: ALL

GENERAL

The pilot can insert waypoints by two methods :
- directly into the flight plan. All modifications go directly into the active flight plan. No temporary flight plan is created.
- by means of a lateral-revision at “NEXT WAYPOINT”, a process that creates a temporary flight plan.

The second method allows to check the temporary flight plan before inserting it.

Ident.: DSC-22_20-30-10-15-B-00009237.0003001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

WAYPOINT IDENTIFICATION

The flight crew can identify a waypoint by:
- Its identifier (if it is in the navigation database)
- A latitude/longitude (AxxByyy: A appears as either N for North, or S for South, and B appears as either, E for East or W for West)
- A Place/Bearing/Distance (PBD). The waypoint is defined by its bearing and distance from a place.

- A Place-Bearing/Place-Bearing (PBX). The waypoint is defined by the interception of 2 radials from 2 places.
- A Place/Distance (PD). The waypoint is defined by a distance from a place, along the F-PLN.

Note: *If a slash or a dash is not entered properly, the MCDU scratchpad displays a FORMAT ERROR message.*

When the FMGES receives a waypoint not in the database, it identifies waypoint as AxxByyy, PBDnn, PBXnn or PDnn (nn is a two-digit number between 01 and 99) and stores it in the stored waypoints file of the database.

Note: *When NAV mode is engaged, the flight crew cannot modify the "TO" waypoint (active leg) using the waypoint insertion function. If the flight crew wants to modify it, the DIR TO function will be used.*

Ident.: DSC-22_20-30-10-15-B-00009237.0001001 / 15 FEB 11
Applicable to: LV-GKO, LV-GKP

WAYPOINT IDENTIFICATION

The pilot can identify a waypoint by:
- Its identifier (if it is in the navigation data base)
- A Latitude/Longitude (AxxByyy: A appears as either N for North, or S for South, and B appears as either, E for East or W for West)
- A Place/Bearing/Distance (PBD). The waypoint is defined by its bearing and distance from a place.
- A Place-Bearing/Place-Bearing (PBX). The waypoint is defined by the interception of 2 radials from 2 places.
- A Place/Distance (PD). The waypoint is defined by a distance from a place, along the F-PLN.

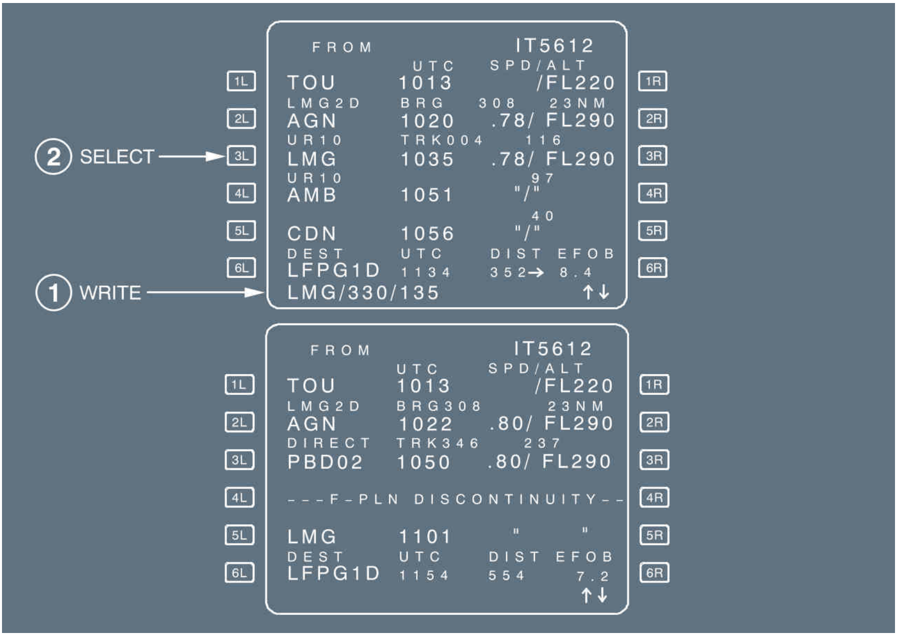
Note: *If a slash or a dash is not entered properly, the Multifunction Control and Display Unit displays a “FORMAT ERROR” message.*

When the Flight Management Guidance System receives a waypoint not in the data base, it identifies it as AxxByyy, PBD xx, PBX xx or PD xx (xx is a two-digit number between 01 and 20) and stores it in the stored waypoints file of the database.

Note: *When NAV mode is engaged, the crew cannot modify the "TO" waypoint (active leg) using the waypoint insertion function. If the crew wants to modify it, the DIR TO function will be used.*

Ident.: DSC-22_20-30-10-15-B-00009238.0001001 / 14 MAY 12
Applicable to: ALL

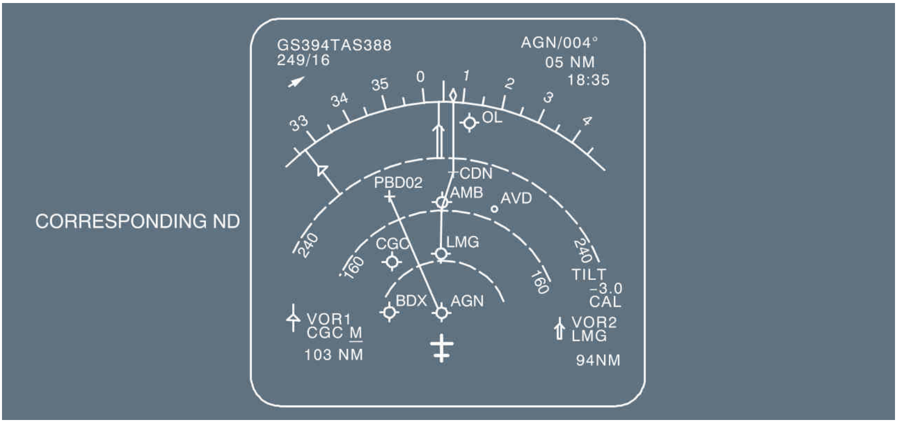
WAYPOINT INSERTED DIRECTLY IN THE FLIGHT PLAN



```
 FROM                    IT5612
             UTC        SPD/ALT
TOU          1013          /FL220
LMG2D        BRG   308    23NM
AGN          1020     .78/ FL290
UR10         TRK004      116
LMG          1035     .78/ FL290
UR10                      97
AMB          1051         "/"
                          40
CDN          1056         "/"
DEST         UTC      DIST  EFOB
LFPG1D       1134     352→  8.4
LMG/330/135                    ↑↓
```

```
 FROM                    IT5612
             UTC        SPD/ALT
TOU          1013          /FL220
LMG2D        BRG308       23NM
AGN          1022     .80/ FL290
DIRECT       TRK346     237
PBD02        1050     .80/ FL290
 
---F-PLN DISCONTINUITY--
 
LMG          1101        "      "
DEST         UTC      DIST  EFOB
LFPG1D       1154     554    7.2
                               ↑↓
```

② SELECT
① WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R



CORRESPONDING ND

GS394TAS388
249/16
AGN/004°
05 NM
18:35
33
34
35
0
1
2
3
4
OL
PBD02
CDN
AMB
AVD
240
CGC
LMG
240
160
160
TILT
-3.0
CAL
BDX
AGN
VOR1
CGC M
103 NM
VOR2
LMG
94NM

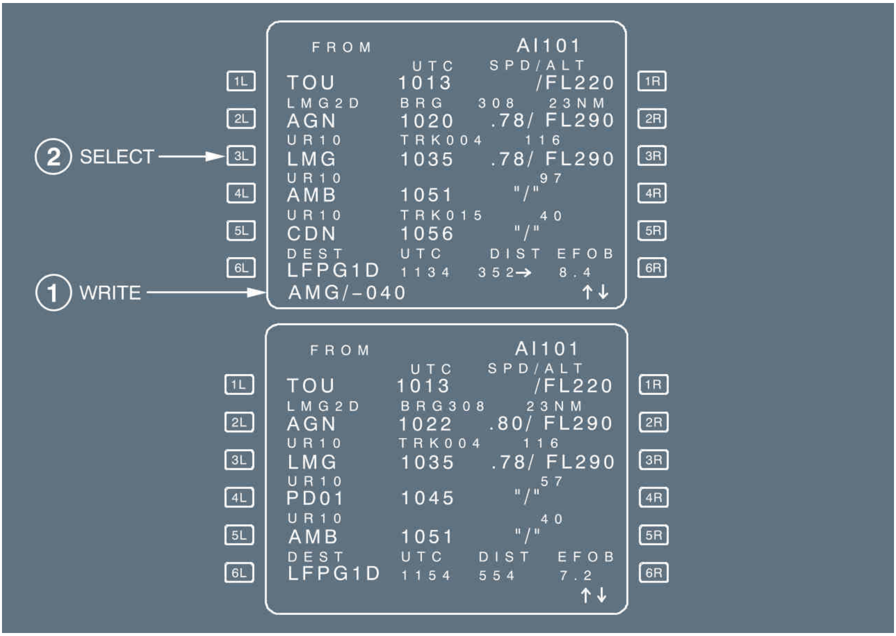
WRITE the waypoint identifier or LAT/LONG, Place/Bearing/Distance or Place-Bearing/Place-Bearing into the scratchpad. (Example : Place : LMG, Bearing: 330 °, Distance : 135 NM)
PRESS the appropriate key to enter the waypoint into the flight plan. The rule is that the new waypoint appears next to the pressed key, and the previous waypoint moves down the flight plan path.

This operation creates a discontinuity between the new waypoint and the previous one. The new flight plan will have to be cleared of the discontinuity and some waypoints erased.

Ident.: DSC-22_20-30-10-15-B-00009239.0001001 / 14 MAY 12
Applicable to: ALL

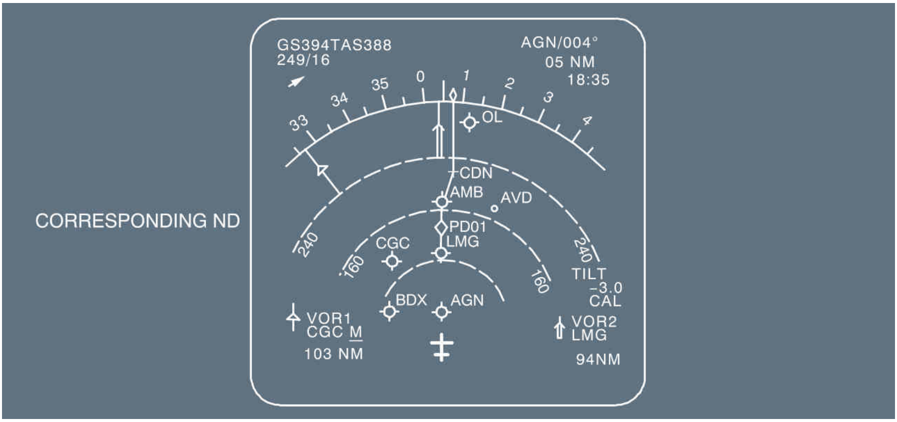
ALONG TRACK WAYPOINT INSERTION

The pilot can enter in the F-PLN page or in the STEP ALTS page an along track waypoint defined as a place/distance waypoint.



```
 FROM                      AI101
            UTC     SPD/ALT
TOU         1013      /FL220
LMG2D       BRG   308   23NM
AGN         1020    .78/ FL290
UR10        TRK004     116
LMG         1035    .78/ FL290
UR10                    97
AMB         1051       "/"
UR10        TRK015     40
CDN         1056       "/"
DEST        UTC     DIST  EFOB
LFPG1D      1134    352→   8.4
AMG/-040                    ↑↓
```

```
 FROM                      AI101
            UTC     SPD/ALT
TOU         1013      /FL220
LMG2D       BRG308      23NM
AGN         1022    .80/ FL290
UR10        TRK004     116
LMG         1035    .78/ FL290
UR10                    57
PD01        1045       "/"
UR10                    40
AMB         1051       "/"
DEST        UTC     DIST  EFOB
LFPG1D      1154    554    7.2
                            ↑↓
```


CORRESPONDING ND
GS394TAS388
249/16
AGN/004°
05 NM
18:35
33
34
35
0
1
2
3
4
OL
CDN
AMB
AVD
PD01
LMG
CGC
240
160
240
160
TILT
-3.0
CAL
BDX
AGN
VOR1
CGC M
103 NM
VOR2
LMG
94NM

WRITE the waypoint identifier and distance from this place.

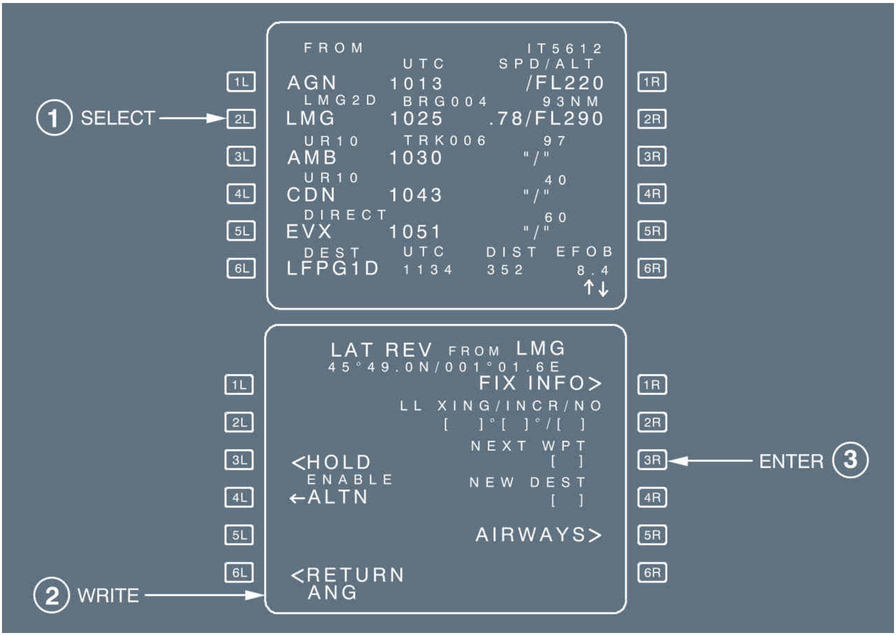
According to the sign of the distance, the crew may define an along track waypoint before or after the revised place. (Example : AMB/-040).

PRESS the appropriate key adjacent to the place identifier. The system positions the waypoint automatically in the flight plan.

This operation does not create any discontinuity.
The system does not accept an along track waypoint entered at the FROM waypoint.

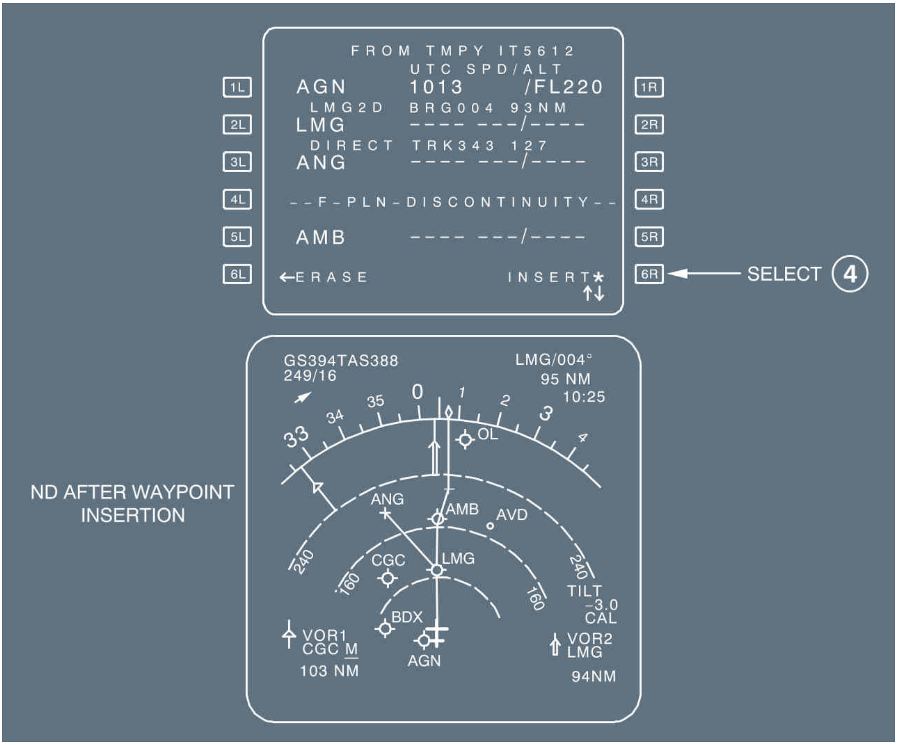
Ident.: DSC-22_20-30-10-15-B-00009240.0001001 / 14 MAY 12
Applicable to: ALL

WAYPOINT INSERTED THROUGH THE USE OF "NEXT WAYPOINT"



```
 FROM                        IT5612
            UTC          SPD/ALT
AGN        1013           /FL220
 LMG2D      BRG004          93NM
LMG        1025       .78/FL290
 UR10       TRK006           97
AMB        1030             "/"
 UR10                        40
CDN        1043             "/"
 DIRECT                      60
EVX        1051             "/"
 DEST       UTC      DIST   EFOB
LFPG1D      1134     352     8.4
                              ↑↓
```

```
     LAT REV FROM LMG
   45°49.0N/001°01.6E
                     FIX INFO>
           LL XING/INCR/NO
              [  ]°[  ]°/[  ]
                    NEXT WPT
<HOLD                    [  ]
 ENABLE             NEW DEST
←ALTN                    [  ]

                     AIRWAYS>

<RETURN
 ANG
```

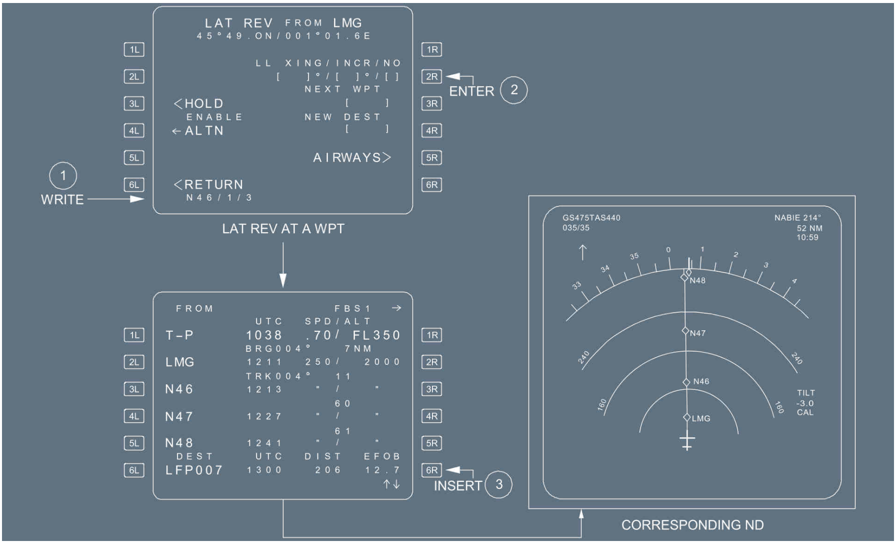

FROM TMPY IT5612
UTC SPD/ALT
AGN 1013 /FL220
LMG2D BRG004 93NM
LMG ---- ---/----
DIRECT TRK343 127
ANG ---- ---/----
--F-PLN-DISCONTINUITY--
AMB ---- ---/----
←ERASE
INSERT*
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SELECT ④
ND AFTER WAYPOINT INSERTION
GS394TAS388
249/16
LMG/004°
95 NM
10:25
33
34
35
0
1
2
3
4
OL
ANG
AMB
AVD
CGC
LMG
BDX
AGN
240
160
240
160
TILT
-3.0
CAL
VOR1
CGC M
103 NM
VOR2
LMG
94NM

SELECT the lateral revision (LAT REV) function at an appropriate waypoint.
WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing / Place-Bearing into the scratchpad.
ENTER it in the brackets under NEXT WPT (next waypoint).
INSERT the temporary flight plan by depressing the [6R] key
CLEAR the F-PLN discontinuity as appropriate.

Ident.: DSC-22_20-30-10-15-B-00009241.0001001 / 03 NOV 21
Applicable to: ALL

LATITUDE/LONGITUDE CROSSING WAYPOINT INSERTION

This function allows the insertion of one or several points along the flight-plan beyond the revised waypoint at fixed latitude or longitude intervals (INCR) from a specified latitude or longitude. These waypoints are not considered as part of the flight crew defined elements, the system deletes them when sequenced.


LAT REV FROM LMG
45°49.0N/001°01.6E
LL XING/INCR/NO
[ ]°/[ ]°/[ ]
NEXT WPT
[ ]
<HOLD
ENABLE
←ALTN
NEW DEST
[ ]
AIRWAYS>
<RETURN
N46/1/3
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
ENTER
2
1
WRITE
LAT REV AT A WPT
FROM
FBS1 →
UTC
SPD/ALT
T-P
1038
.70/ FL350
BRG004°
7NM
LMG
1211
250/ 2000
TRK004°
11
N46
1213
" / "
60
N47
1227
" / "
61
N48
1241
" / "
DEST
UTC
DIST
EFOB
LFP007
1300
206
12.7
↑↓
INSERT
3
GS475TAS440
035/35
NABIE 214°
52 NM
10:59
33
34
35
0
1
2
3
4
N48
N47
N46
LMG
240
240
160
160
TILT
-3.0
CAL
CORRESPONDING ND

WRITE the latitude (NXX, XXN, SXX or XXS), the required increment in degrees between the successive waypoints and the number of required waypoints.

(Example: The flight crew wants to get 3 points, every degree from latitude N46: the flight crew enters N46/1/3).

PRESS [2R] to insert into the LL XING/INCR/NO field.

PRESS [6R] to insert the new waypoints in the flight plan without discontinuity.

The system does not store these waypoints in the database.

FIX INFO

Ident.: DSC-22_20-30-10-15-C-00009242.0001001 / 01 OCT 12

Applicable to: LV-GKO, LV-GKP

When using FIX INFO function, the flight crew defines waypoint intersections of the flight plan with radials associated to a fix.

When the flight crew inserts the intersection point, the system identifies automatically this point, but does not store it in the navigation database.

FIX INFO function offers 2 possible waypoint insertions : radial intercept waypoint and abeam intercept waypoint.

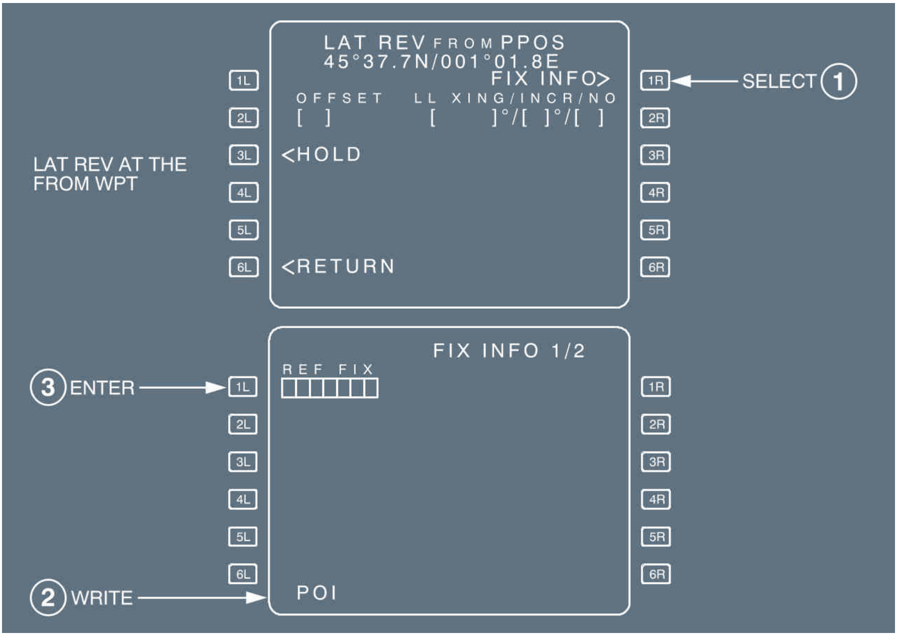
Ident.: DSC-22_20-30-10-15-C-00009242.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

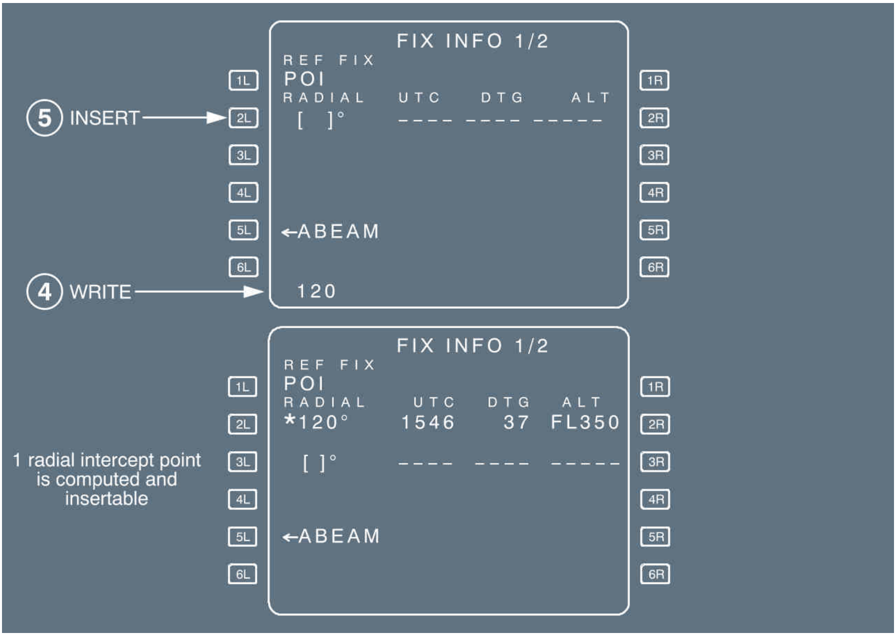
When using the FIX INFO function, the flight crew defines waypoint intersections of the flight plan with radials, circle or abeam associated to a fix.
When the flight crew inserts the intersection point, the system identifies automatically this point, but does not store it in the navigation database.

Ident.: DSC-22_20-30-10-15-C-00009244.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

INSERTING OF A RADIAL INTERCEPT WAYPOINT

The flight crew accesses the radial intercept function from the lateral revision page at origin or at the “from” waypoint.


LAT REV FROM PPOS
45°37.7N/001°01.8E
FIX INFO>
OFFSET
LL XING/INCR/NO
[ ]
[ ]°/[ ]°/[ ]
<HOLD
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SELECT ①
LAT REV AT THE FROM WPT
FIX INFO 1/2
REF FIX
POI
③ ENTER
② WRITE


FIX INFO 1/2
REF FIX
POI
RADIAL UTC DTG ALT
[ ]° ---- ---- -----
←ABEAM
120
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/2
REF FIX
POI
RADIAL UTC DTG ALT
*120° 1546 37 FL350
[ ]° ---- ---- -----
←ABEAM

⑤ INSERT

④ WRITE

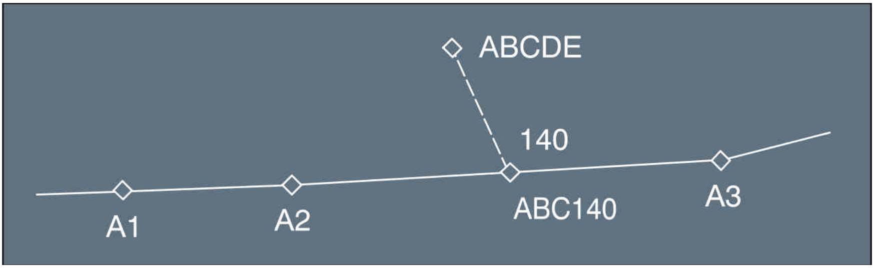
1 radial intercept point is computed and insertable

WRITE the reference fix identifier into the scratchpad. It may be any database or pilot defined fix (here POI).
PRESS key [1L].
WRITE the radial into the scratchpad (here 120 °).
PRESS key [2L] for the first radial.

If the radial line intersects the active flight plan, the system computes the time, distance to go and the altitude at the intersection point.
Up to 3 radials may be entered.

SELECT the required radial to insert the associated waypoint into the flight plan :

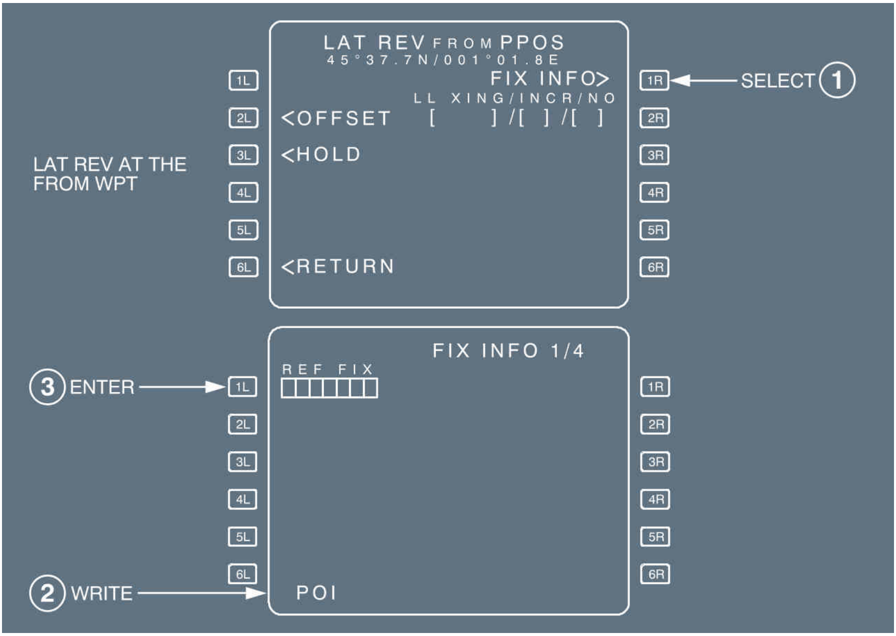
The system automatically assigns its IDENT as the 3 first characters of the reference fix IDENT, followed by the radial. (Example : ABC 140).



Ident.: DSC-22_20-30-10-15-C-00009244.0003001 / 14 MAY 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

INSERTING OF A RADIAL INTERCEPT WAYPOINT

The flight crew accesses the radial intercept function from the lateral revision page at origin or at the “from” waypoint.

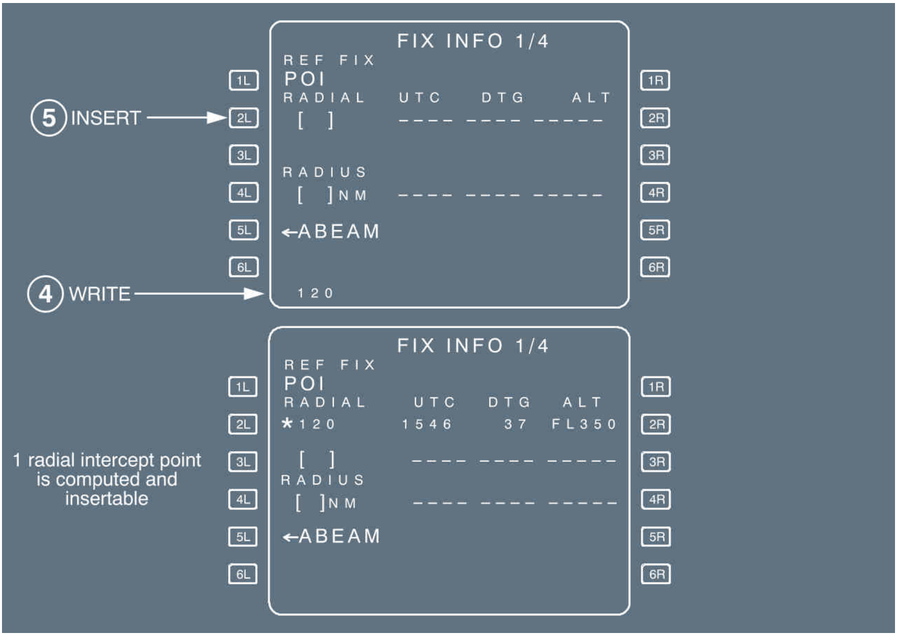

LAT REV FROM PPOS
45°37.7N/001°01.8E
FIX INFO>
LL XING/INCR/NO
<OFFSET [ ] /[ ] /[ ]
<HOLD
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/4
REF FIX
☐☐☐☐☐☐☐
POI

LAT REV AT THE FROM WPT

SELECT ①

② WRITE

③ ENTER

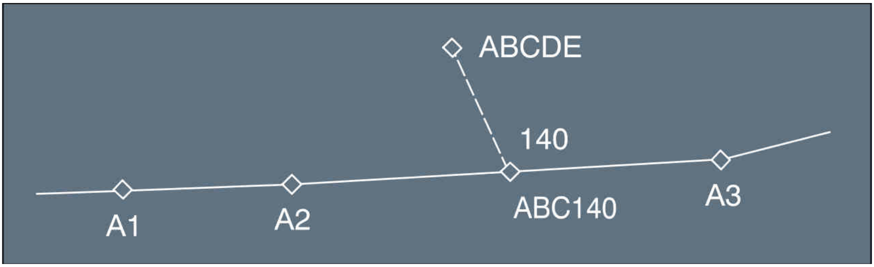

FIX INFO 1/4
REF FIX
POI
RADIAL
UTC
DTG
ALT
[ ]
---- ---- -----
RADIUS
[ ]NM
---- ---- -----
←ABEAM
120
5 INSERT
4 WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/4
REF FIX
POI
RADIAL
UTC
DTG
ALT
*120
1546
37
FL350
[ ]
---- ---- -----
RADIUS
[ ]NM
---- ---- -----
←ABEAM
1 radial intercept point is computed and insertable

WRITE the reference fix identifier into the scratchpad. It may be any database or pilot defined fix (here POI).
PRESS key [1L].
WRITE the radial into the scratchpad (here 120 °).
PRESS key [2L] for the first radial.

The defined radial appears as a blue dashed line on the ND.
If the radial line intersects the active flight plan, the system computes the time, distance to go and the altitude at the intersection point.
Up to 2 radials may be entered.

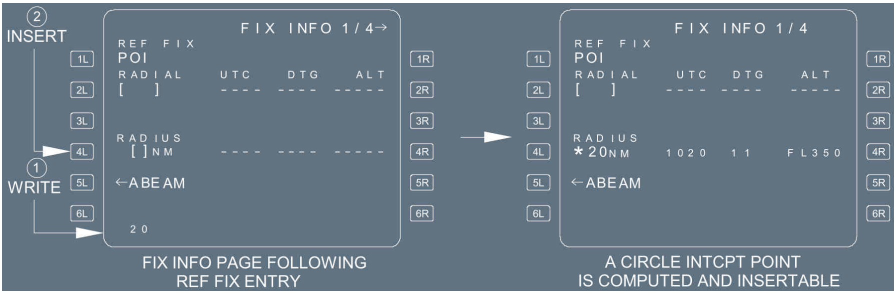
SELECT the required radial to insert the associated waypoint into the flight plan :

The system automatically assigns its IDENT as the 3 first characters of the reference fix IDENT, followed by the radial. (Example : ABC 140).
The blue dashed line disappears from the ND.



Ident.: DSC-22_20-30-10-15-C-00014194.0001001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

INSERTING A CIRCLE INTERCEPT WAYPOINT



```
            FIX INFO 1/4→
REF FIX
POI
RADIAL      UTC    DTG    ALT
[    ]      ----   ----   -----


RADIUS
 [ ]NM      ----   ----   -----
←ABEAM

 20
```

FIX INFO PAGE FOLLOWING
REF FIX ENTRY

```
            FIX INFO 1/4
REF FIX
POI
RADIAL      UTC    DTG    ALT
[    ]      ----   ----   -----


RADIUS
*20NM       1020   11     FL350
←ABEAM
```

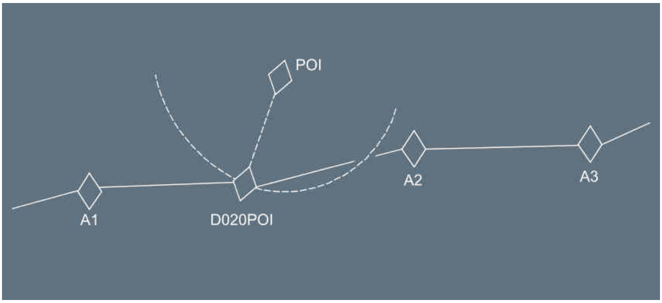
A CIRCLE INTCPT POINT
IS COMPUTED AND INSERTABLE

WRITE the reference fix identifier into the scratchpad (here POI).
PRESS key [1L].
WRITE the circle radius into the scratchpad (here 20 NM).
PRESS key [4L].

The defined circle appears as a blue dashed circle on the ND.
If the circle intersects the active flight plan, the system computes the time, along path distance to go and altitude at the first intersection point from the current aircraft position.
Up to 2 radials may be entered.

SELECT the required radius to insert the associated waypoint into the flight plan (if needed) :

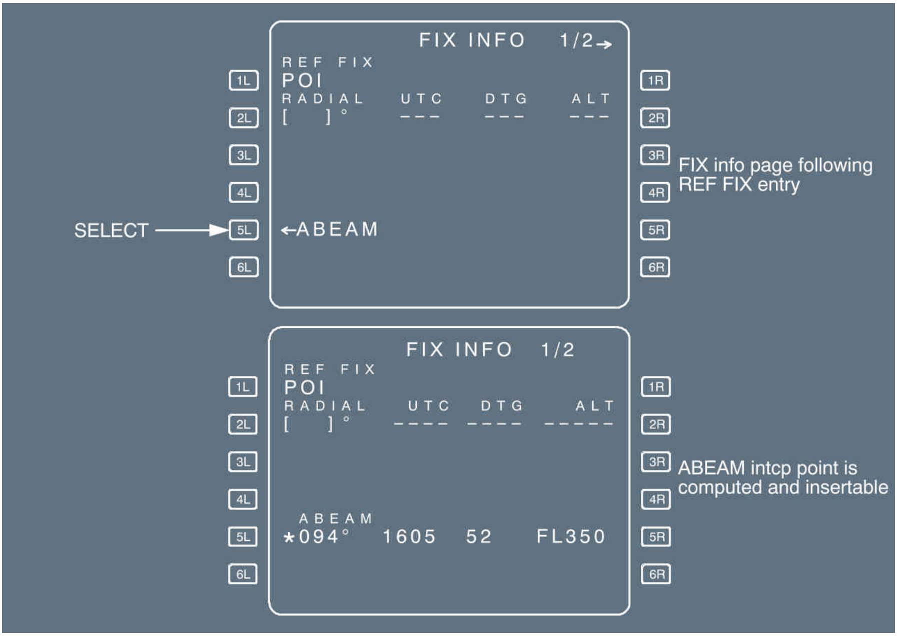
The system automatically assigns its IDENT as a D, followed by the radius, and followed by the 3 first characters of the reference fix IDENT (Example : D020 POI).
The blue dashed circle disappears from the ND.


POI
A1
D020POI
A2
A3

Ident.: DSC-22_20-30-10-15-C-00009245.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

INSERTING AN ABEAM INTERCEPT WAYPOINT

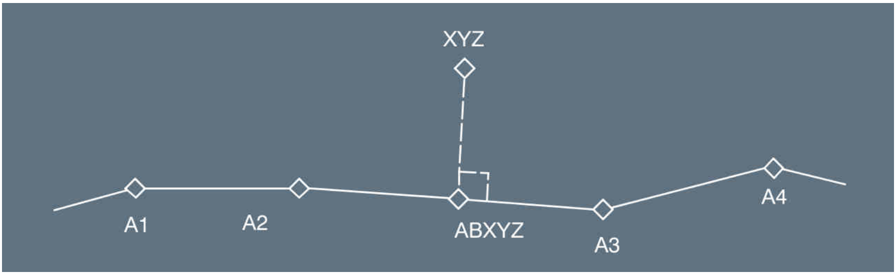
The flight crew accesses this function from the lateral revision page at origin or at the FROM waypoint.


FIX INFO 1/2→
REF FIX
POI
RADIAL UTC DTG ALT
[ ]° --- --- ---
←ABEAM
SELECT
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/2
REF FIX
POI
RADIAL UTC DTG ALT
[ ]° ---- ---- -----
ABEAM
*094° 1605 52 FL350

FIX info page following REF FIX entry

ABEAM intcp point is computed and insertable

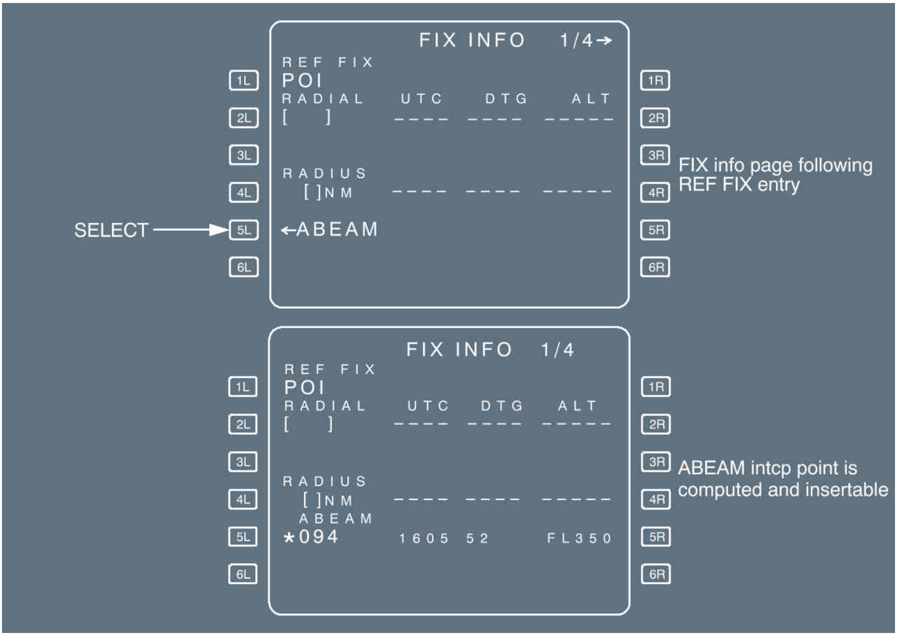
WRITE the reference fix identifier into the scratchpad (here POI).
PRESS key [1L].
SELECT the ABEAM prompt : the system computes the radial, time, distance to go, altitude and predictions related to the waypoint abeam the reference fix.
SELECT key [5L] to insert the abeam intercept waypoint into the flight plan : the system automatically assigns its identifier as AB, followed by the 5 first characters of the reference fix identifier (Example ABXYZ)



Ident.: DSC-22_20-30-10-15-C-00009245.0003001 / 14 MAY 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

INSERTING AN ABEAM INTERCEPT WAYPOINT

The flight crew accesses this function from the lateral revision page at origin or at the FROM waypoint.


FIX INFO 1/4→
REF FIX
POI
RADIAL UTC DTG ALT
[ ] ---- ---- -----
RADIUS
[ ]NM ---- ---- -----
←ABEAM
SELECT
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/4
REF FIX
POI
RADIAL UTC DTG ALT
[ ] ---- ---- -----
RADIUS
[ ]NM ---- ---- -----
ABEAM
*094 1605 52 FL350

FIX info page following REF FIX entry

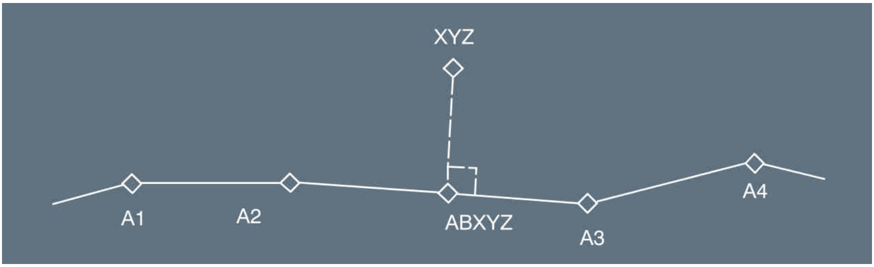
ABEAM intcp point is computed and insertable

WRITE the reference fix identifier into the scratchpad (here POI).
PRESS key [1L].
SELECT the ABEAM prompt [5L].

A blue dashed line from the reference fix and perpendicular to the flight plan appears on the ND. The system computes the radial, time, distance to go, altitude and predictions related to the waypoint abeam the reference fix.

SELECT key [5L] to insert the abeam intercept waypoint into the flight plan :

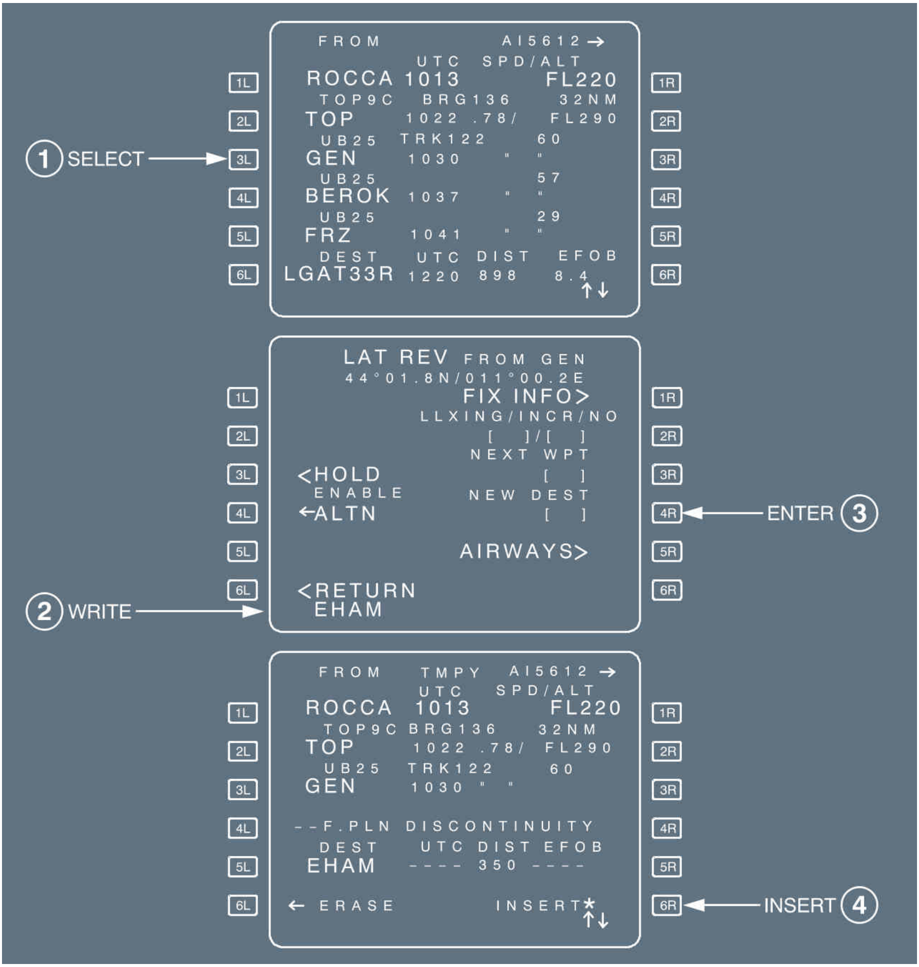
The system automatically assigns its identifier as AB, followed by the 5 first characters of the reference fix identifier (Example ABXYZ).
The blue dashed line disappears from the ND.



INSERTING A NEW DESTINATION

Ident.: DSC-22_20-30-10-15-00009246.0001001 / 14 MAY 12
Applicable to: ALL

The pilot may define a new destination and insert it through the lateral revision page. The pilot may then call up the new destination from any waypoint along the flight plan except the FROM waypoint, the destination, and the missed-approach waypoint. When the new destination has been inserted, a flight plan discontinuity appears between the revision waypoint and the new destination. All waypoints beyond the revision waypoint (including the previous destination and associated missed approach) are deleted.



```
   FROM                AI5612→
            UTC    SPD/ALT
ROCCA      1013          FL220
  TOP9C    BRG136        32NM
TOP        1022 .78/    FL290
  UB25     TRK122       60
GEN        1030    "    "
  UB25                  57
BEROK      1037    "    "
  UB25                  29
FRZ        1041    "    "
  DEST     UTC   DIST   EFOB
LGAT33R    1220  898    8.4
                          ↑↓
```

```
      LAT REV FROM GEN
      44°01.8N/011°00.2E
                    FIX INFO>
             LLXING/INCR/NO
                   [   ]/[   ]
                   NEXT WPT
<HOLD                 [   ]
 ENABLE            NEW DEST
←ALTN                 [   ]

                   AIRWAYS>

<RETURN
 EHAM
```

```
   FROM     TMPY   AI5612→
           UTC    SPD/ALT
ROCCA     1013        FL220
  TOP9C  BRG136      32NM
TOP       1022 .78/  FL290
  UB25   TRK122      60
GEN       1030 "  "

--F.PLN DISCONTINUITY
  DEST     UTC  DIST EFOB
EHAM      ----  350  ----

←  ERASE            INSERT*
                        ↑↓
```

SELECT the lateral revision function at an appropriate waypoint.
WRITE the new destination in the scratchpad.
Enter it in the brackets under NEW DEST
INSERT the temporary flight plan ([6R] key), and complete the flight plan to the new destination.

HOLDING PATTERN

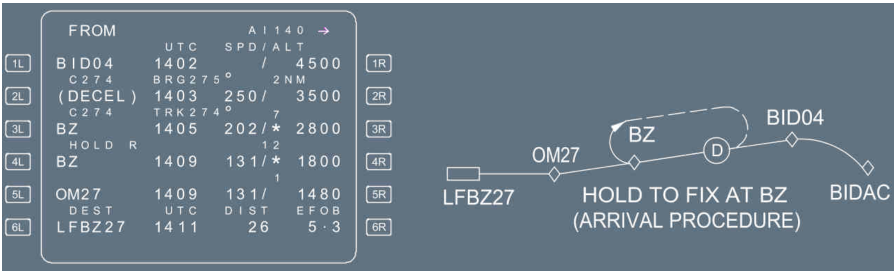
Ident.: DSC-22_20-30-10-15-D-00009247.0001001 / 15 FEB 11
Applicable to: ALL

Holding pattern description, associated guidance and flight crew procedures are put together in this chapter.
The flight management and guidance computer (FMGC) has three types of holding pattern that the pilot can use in a flight plan.

Ident.: DSC-22_20-30-10-15-D-00009248.0001001 / 21 NOV 11
Applicable to: ALL

HOLD TO FIX (HF)

The holding pattern is always part of an arrival or departure procedure. The aircraft flies it once and then exits the holding pattern automatically at the fix. The predicted speed in the holding pattern is the lowest of ICAO speed limit, max endurance speed, or any speed constraint.
Guidance to the fix in the holding pattern is similar to that on any leg of a flight plan. The HF patterns are part of the navigation database and cannot be created by the crew.

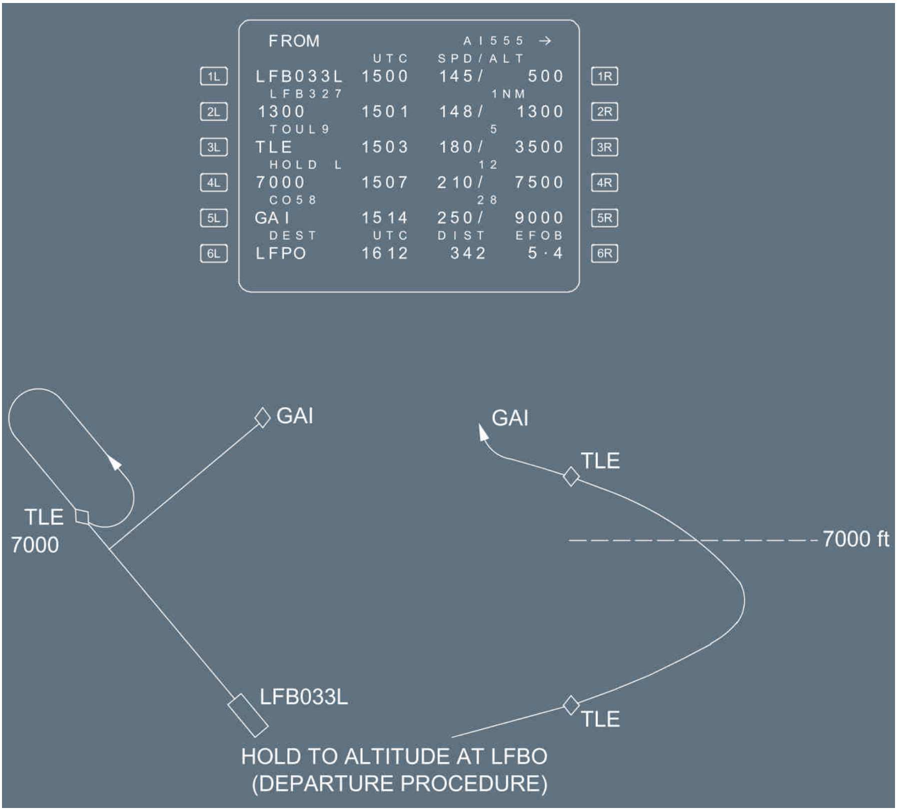


```
 FROM                   AI140 →
           UTC    SPD/ALT
BID04      1402       /  4500
  C274     BRG275°     2NM
(DECEL)    1403   250/   3500
  C274     TRK274°       7
BZ         1405   202/*  2800
  HOLD  R                12
BZ         1409   131/*  1800
                         1
OM27       1409   131/   1480
  DEST     UTC    DIST   EFOB
LFBZ27     1411     26   5.3
```

Ident.: DSC-22_20-30-10-15-D-00009249.0001001 / 21 NOV 11
Applicable to: ALL

HOLD TO ALTITUDE (HA)

This type of holding pattern is also part of an arrival or departure procedure.
The aircraft flies the hold until it reaches the specified altitude. Then it exits the hold automatically at the fix.
The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed or any speed constraint.
The size of the holding pattern is a function of the predicted speed.
Guidance in a hold to altitude (HA) is similar to that for any leg of a flight plan.
The HAs are in the navigation database as part of arrival or departure procedures and cannot be created by the crew.



```
     FROM                    AI555 →
                   UTC    SPD/ALT
1L   LFB033L      1500    145/      500   1R
      LFB327                  1NM
2L   1300         1501    148/     1300   2R
      TOUL9                    5
3L   TLE          1503    180/     3500   3R
      HOLD  L                 12
4L   7000         1507    210/     7500   4R
      CO58                    28
5L   GAI          1514    250/     9000   5R
      DEST         UTC    DIST     EFOB
6L   LFPO         1612     342      5.4   6R
```

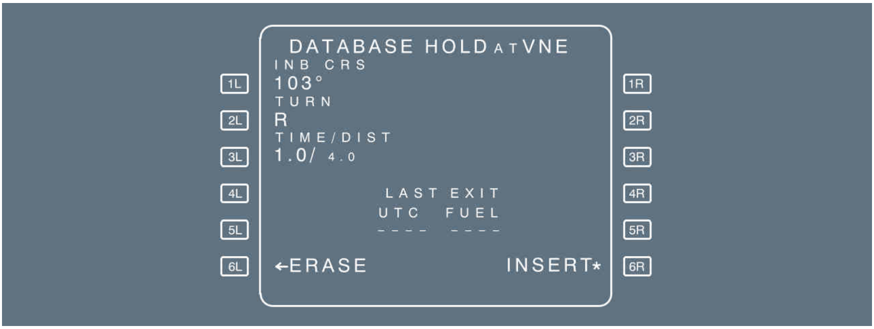
HOLD TO ALTITUDE AT LFBO
(DEPARTURE PROCEDURE)

Ident.: DSC-22_20-30-10-15-D-00009250.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the pilot may enter it at present position or at any flight plan waypoint.
The pilot will use this type of holding pattern to comply with a defined procedure or a clearance limit or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).
This type of holding pattern is exited under pilot decision and not automatically.
There are 3 types of HM, all are modifiable.

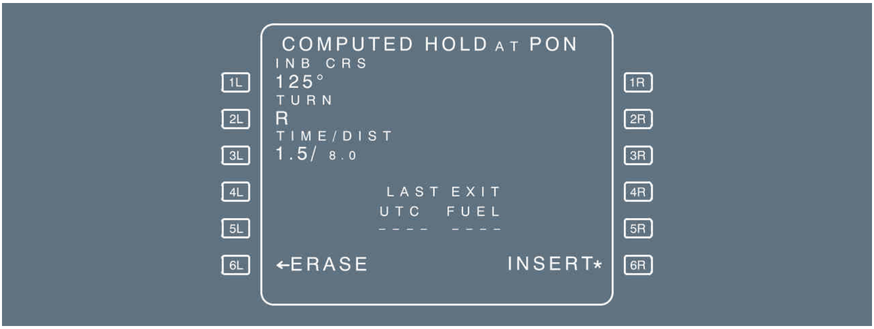
DATABASE HOLD



DATABASE HOLD AT VNE
INB CRS
103°
TURN
R
TIME/DIST
1.0/ 4.0
LAST EXIT
UTC FUEL
---- ----
←ERASE INSERT*

If the holding pattern is part of the database, it is named DATABASE HOLD and all its associated data (inbound course, turn direction, time/distance) are defined in the data base. Flight crew can modify this data.

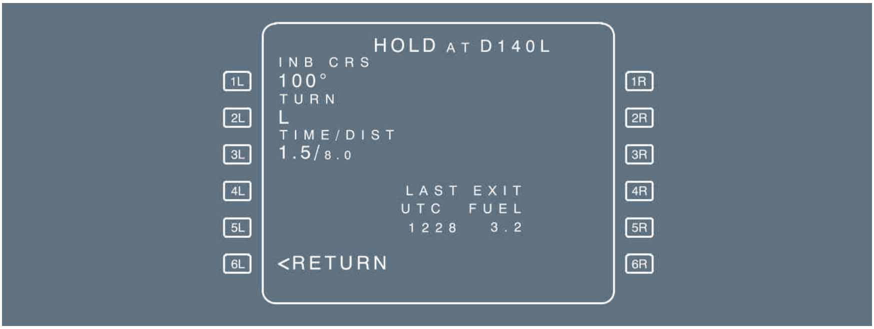
COMPUTED HOLD AT ...



COMPUTED HOLD AT PON
INB CRS
125°
TURN
R
TIME/DIST
1.5/ 8.0
LAST EXIT
UTC FUEL
---- ----
←ERASE INSERT*

If the holding pattern is not in the database, the FMGC designs a holding pattern and proposes it to the pilot. The associated data consists of default values that the pilot can modify.

HOLD AT ...



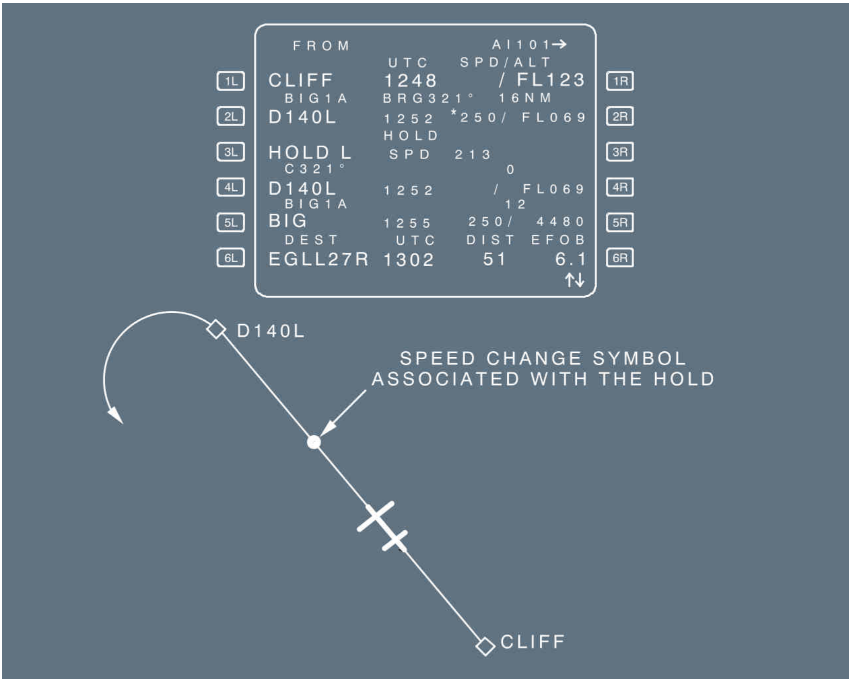
```
          HOLD AT D140L
INB CRS
100°
TURN
L
TIME/DIST
1.5/8.0

             LAST  EXIT
             UTC   FUEL
             1228   3.2
<RETURN
```

If the pilot inserts into the active flight plan a holding pattern that is manually corrected from a hold defined by the FMGS, the screen displays a “HOLD AT ...” page. The field 2R displays REVERT TO DATABASE or REVERT TO COMPUTED to restore the database data if necessary.

PREDICTIONS AND GUIDANCE ASSOCIATED WITH AN HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

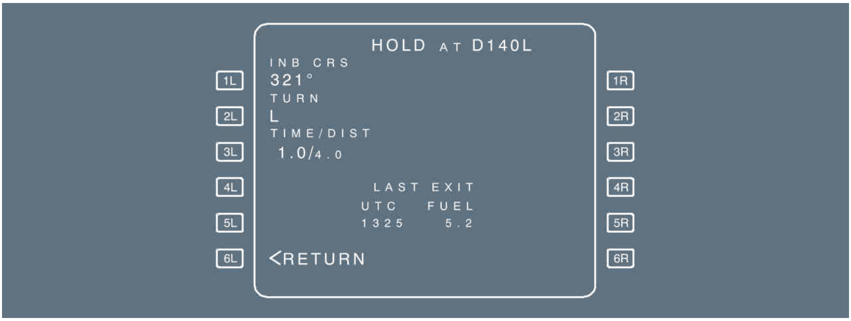
Before Deceleration

Although the hold is inserted into the flight plan, the FMGES does not take it into account for predictions until the aircraft enters the hold.
However, if the hold is not deleted by the crew, the FMGES schedules a deceleration point and displays it on the ND.



```
 FROM                         AI101→
              UTC     SPD/ALT
CLIFF         1248        / FL123
 BIG1A        BRG321°    16NM
D140L         1252   *250/  FL069
              HOLD
HOLD L         SPD   213
 C321°                  0
D140L         1252        /  FL069
 BIG1A                   12
BIG           1255     250/   4480
 DEST          UTC     DIST   EFOB
EGLL27R       1302      51     6.1
                                ↑↓
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
D140L
SPEED CHANGE SYMBOL
ASSOCIATED WITH THE HOLD
CLIFF



```
          HOLD AT D140L
INB CRS
321°
TURN
L
TIME/DIST
 1.0/4.0

         LAST EXIT
        UTC    FUEL
        1325    5.2

<RETURN
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

The FMGES predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding so as to comply with the fuel policy specified on the fuel prediction page. When the aircraft enters the holding pattern, the FMGES revises all predictions and assumes the aircraft will fly one turn of the holding pattern.

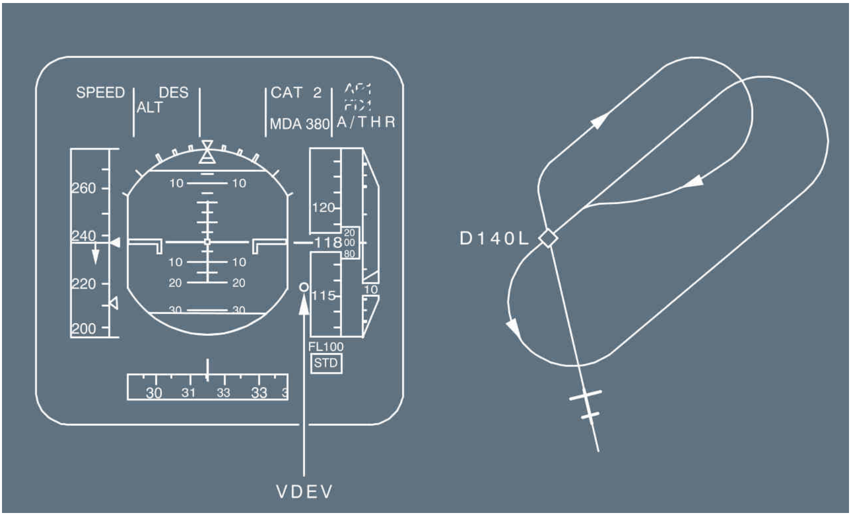
All predictions are revised if there is one additional holding pattern when the holding fix is overflown.

On Reaching the Speed Change Pseudo Waypoint

The FMGES either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays “SET HOLD SPD” (set hold speed) on the MCDU and primary flight display if the flight crew has selected a speed target.

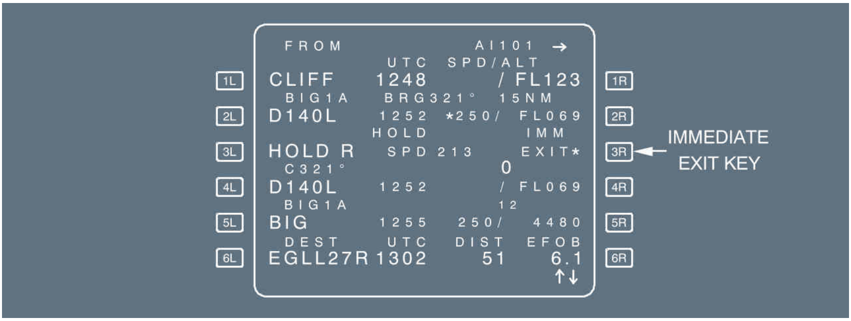
The default hold speed is the lowest of:
- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

When no specific speed limit applies, the default hold speed is the Maximum Endurance speed, which is approximately equal to Green Dot in clean configuration (it can vary between Green Dot and Green Dot +10 kt, depending on the aircraft weight, altitude and temperature). The flight plan predictions for time and fuel do not yet consider that the hold will be flown. However, the navigation display shows the hold entry and holding pattern trajectory.



Deceleration receives priority, so that when the aircraft is in descent with the descent mode engaged, it will deviate above the descent path to decelerate. (VDEV becomes positive on the progress page).
The flight plan page displays an immediate exit prompt.

If the flight crew presses the key next to “IMM EXIT” before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its phase-related managed-speed profile.



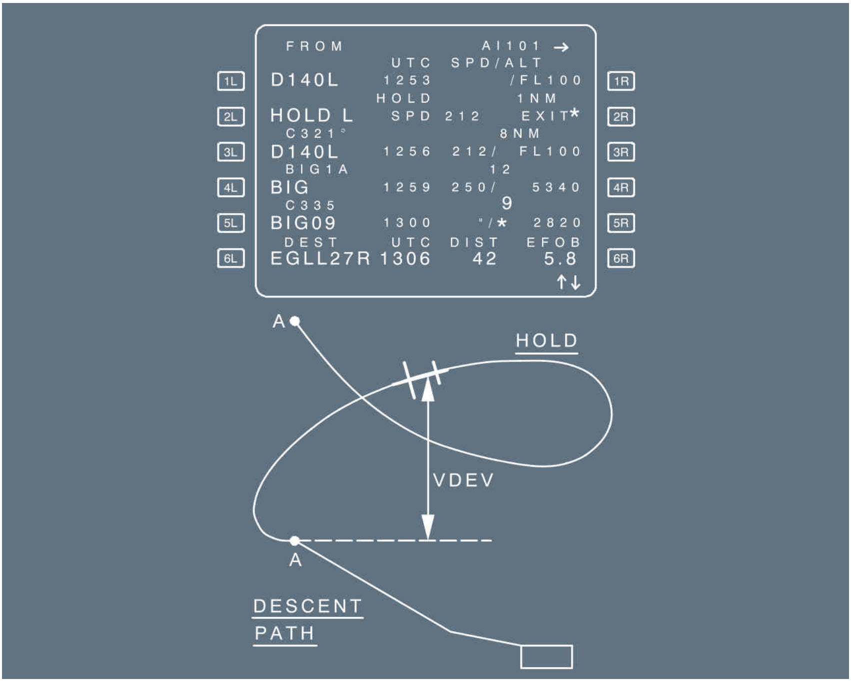
```
 FROM              AI101 →
          UTC  SPD/ALT
CLIFF     1248      / FL123
 BIG1A    BRG321°   15NM
D140L     1252 *250/  FL069
          HOLD         IMM
HOLD R    SPD 213     EXIT*
 C321°               0
D140L     1252      /  FL069
 BIG1A               12
BIG       1255  250/   4480
 DEST     UTC   DIST   EFOB
EGLL27R 1302     51     6.1
                        ↑↓
```

After Reaching the Hold Entry Fix

The aircraft enters the hold. The MCDU HOLD page displays the associated holding data:
- The inbound course (INB CRS)
- The TURN direction (L or R)
- The TIME/DIST
- The LAST EXIT time and the associated fuel to reach the alternate airport with no extra fuel.

The FMS assumes that the aircraft will fly one turn of the holding pattern, and revises the predictions accordingly.

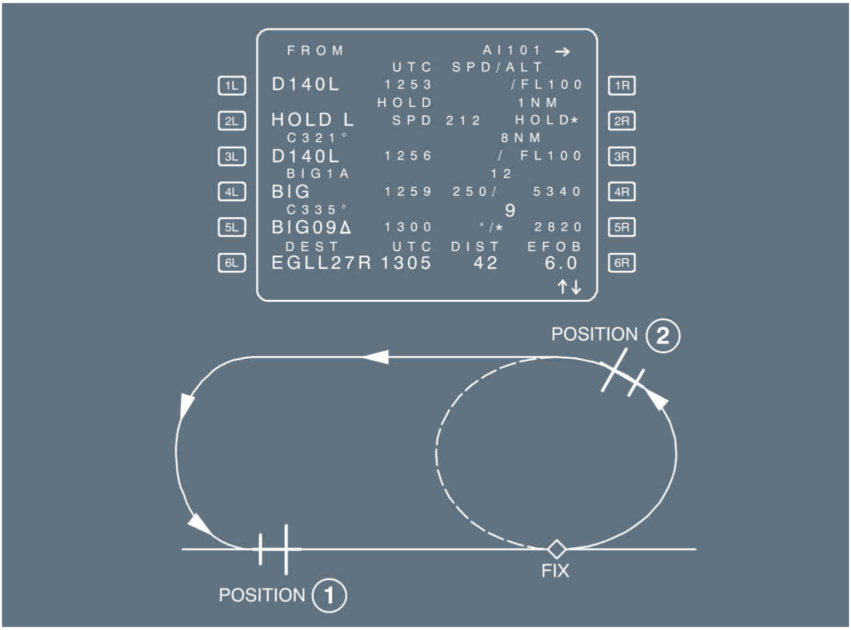
When the holding pattern is defined by a leg time (and not a leg distance), the system revises the size of the hold as a function of the target speed:
- If managed speed is active, the system uses the predicted holding speed to calculate the size of the holding pattern.
- If the selected speed is active, the system uses the target speed the flight crew selects at the entry fix sequencing to calculate the size of the holding pattern.
- The VDEV displayed on the primary flight display and the PROG page when the aircraft is flying in the HM (hold pattern with manual termination) is the difference between the aircraft's current altitude, and the altitude at which it should be, when it reaches the hold exit fix in order to be positioned correctly on the descent path.



```
      FROM                    AI101 →
              UTC   SPD/ALT
1L  D140L     1253        /FL100     1R
             HOLD            1NM
2L  HOLD L    SPD 212      EXIT*     2R
      C321°                8NM
3L  D140L     1256  212/  FL100      3R
      BIG1A              12
4L  BIG       1259  250/   5340      4R
      C335                9
5L  BIG09     1300   "/*   2820      5R
      DEST    UTC   DIST   EFOB
6L  EGLL27R 1306     42     5.8      6R
                              ↑↓
```

With IMM EXIT Pressed (Aircraft in the Holding Pattern)

The predictions and guidance assume that the aircraft is returning immediately to the hold fix. Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation. The flight plan page displays “RESUME HOLD*” instead of “IMM EXIT*”.



```
 FROM                 AI101 →
           UTC   SPD/ALT
D140L      1253        /FL100
           HOLD          1NM
HOLD L     SPD 212     HOLD*
 C321°                   8NM
D140L      1256      /  FL100
 BIG1A                  12
BIG        1259  250/    5340
 C335°                  9
BIG09Δ     1300   "/*    2820
 DEST      UTC   DIST    EFOB
EGLL27R 1305     42      6.0
                           ↑↓
```

HOLD EXIT PROCEDURE

Position (1) If “IMM EXIT” pressed, aircraft will exit at next fix overfly.
Position (2) If “IMM EXIT” pressed, aircraft will make an immediate turn to the fix where hold will be exited.

- **If managed speed is active** , the computer sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit).

  The computer then bases its predictions on the assumption that the flight will continue on the descent path, if the aircraft is in a descent.

- **If DES mode is engaged**

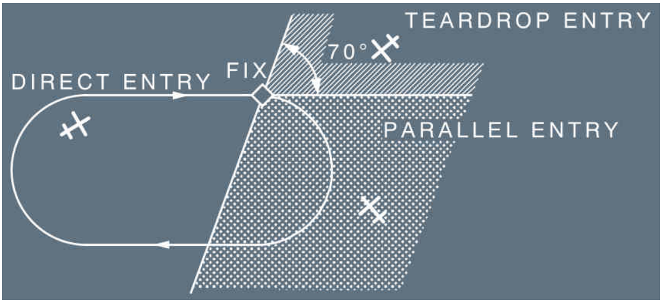
  the following applies:
  - The holding pattern is never included in the descent path computation.
  - The flight crew cannot enter altitude and speed constraints at the hold exit fix (this is only allowed at the hold entry fix).
  - The vertical guidance in the HM during the descent phase calls for a constant -1 000 ft/min, but the computer considers altitude constraints that will take effect farther down the flight path as it calculates vertical guidance and predictions. The system will not allow the aircraft to descend below the next altitude constraint. If the aircraft reaches the next altitude constraint, it will level off, and the altitude constraint mode will engage.

With Resume Hold Pressed

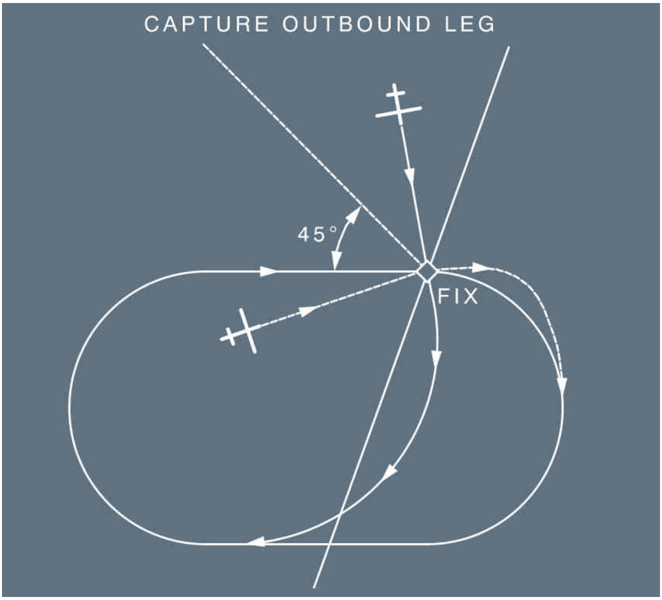
If the flight crew presses the key next to “RESUME HOLD”, the aircraft remains in the holding pattern, and the display again shows “IMM EXIT”.
After that, each time the aircraft flies over the holding fix, the system updates the predictions for one more holding circuit.

HOLDING PATTERN ENTRIES

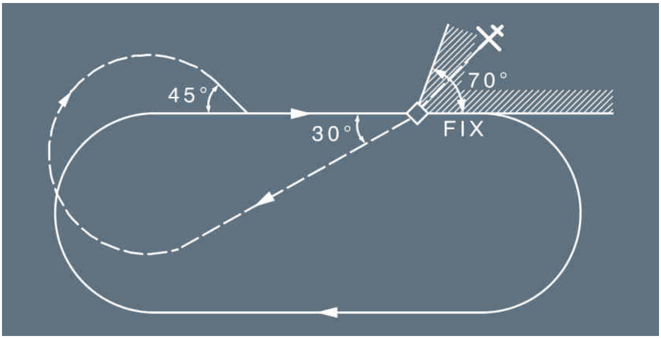
The FMGES offers three types of entry into holding patterns:
1. Direct entry
2. Teardrop entry
3. Parallel entry



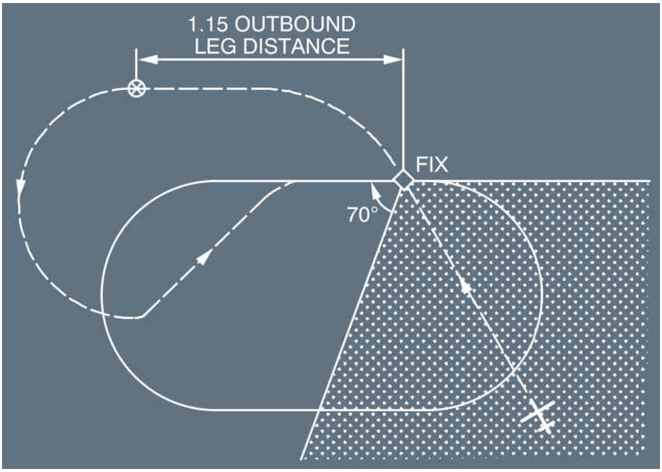
1. The Direct Entry


CAPTURE OUTBOUND LEG
45°
FIX

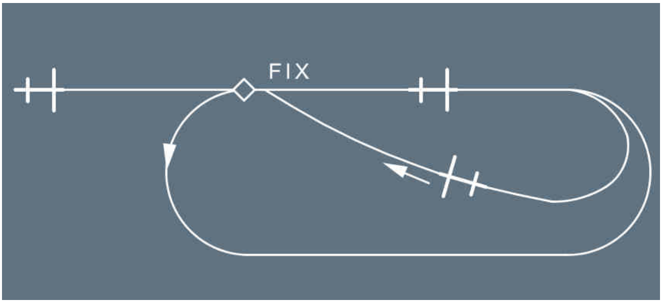
2. The Teardrop Entry



3. The Parallel Entry



Note: *If the leg the aircraft is flying toward the holding fix is on a "limit" between a teardrop entry and a parallel entry, the FMGEC may compute and display either of the two entries. The pilot should keep this in mind and not assume that the FMGEC is malfunctioning.*
If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a parallel entry.



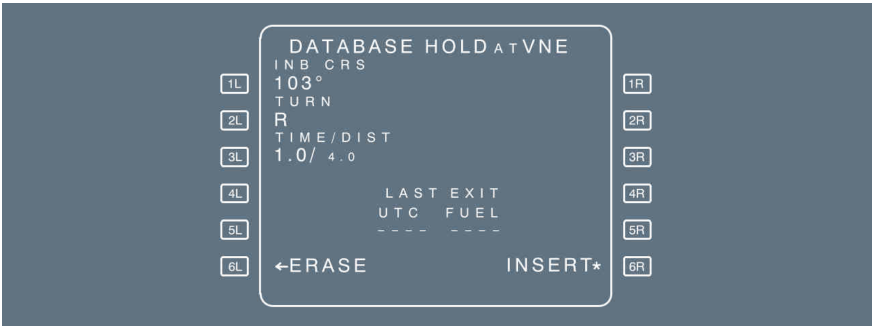
Ident.: DSC-22_20-30-10-15-D-00009250.0009001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the pilot may enter it at present position or at any flight plan waypoint.

The pilot will use this type of holding pattern to comply with a defined procedure or a clearance limit or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).
This type of holding pattern is exited under pilot decision and not automatically.
There are 3 types of HM, all are modifiable.

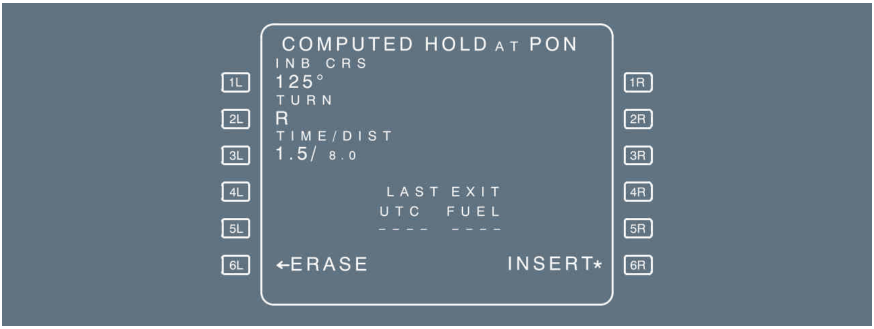
DATABASE HOLD



DATABASE HOLD AT VNE
INB CRS
103°
TURN
R
TIME/DIST
1.0/ 4.0
LAST EXIT
UTC FUEL
---- ----
←ERASE INSERT*

If the holding pattern is part of the database, it is named DATABASE HOLD and all its associated data (inbound course, turn direction, time/distance) are defined in the data base. Flight crew can modify this data.

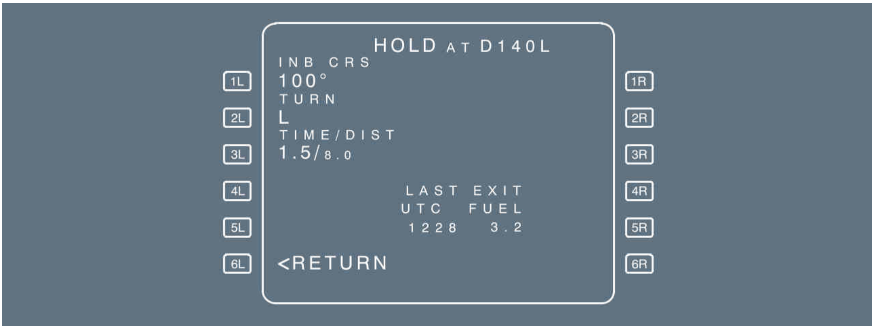
COMPUTED HOLD AT ...



COMPUTED HOLD AT PON
INB CRS
125°
TURN
R
TIME/DIST
1.5/ 8.0
LAST EXIT
UTC FUEL
---- ----
←ERASE INSERT*

If the holding pattern is not in the database, the FMGC designs a holding pattern and proposes it to the pilot. The associated data consists of default values that the pilot can modify.

HOLD AT ...



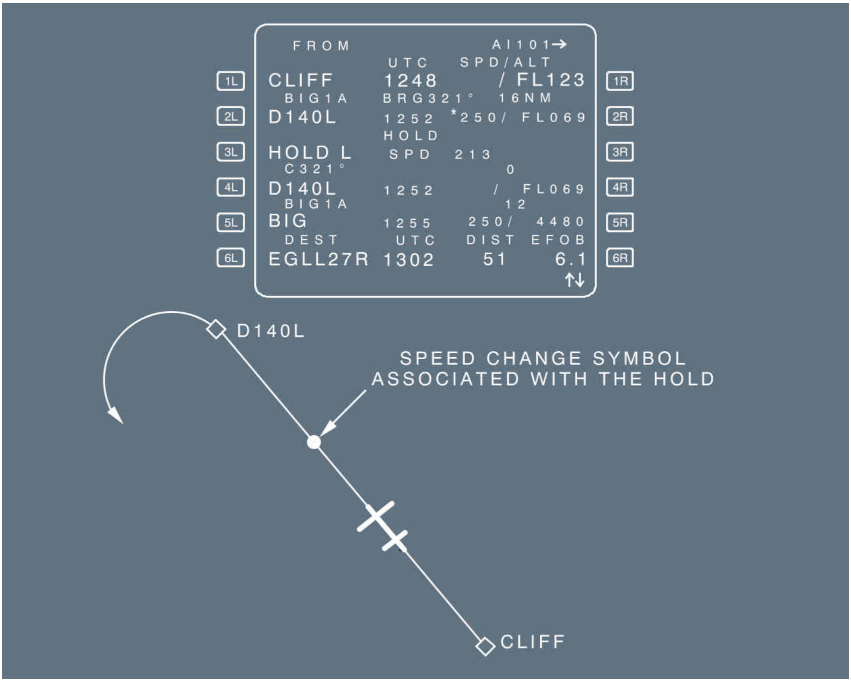
HOLD AT D140L
INB CRS
100°
TURN
L
TIME/DIST
1.5/8.0
LAST EXIT
UTC FUEL
1228 3.2
<RETURN

If the pilot inserts into the active flight plan a holding pattern that is manually corrected from a hold defined by the FMGS, the screen displays a “HOLD AT ...” page. The field 2R displays REVERT TO DATABASE or REVERT TO COMPUTED to restore the database data if necessary.

PREDICTIONS AND GUIDANCE ASSOCIATED WITH AN HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

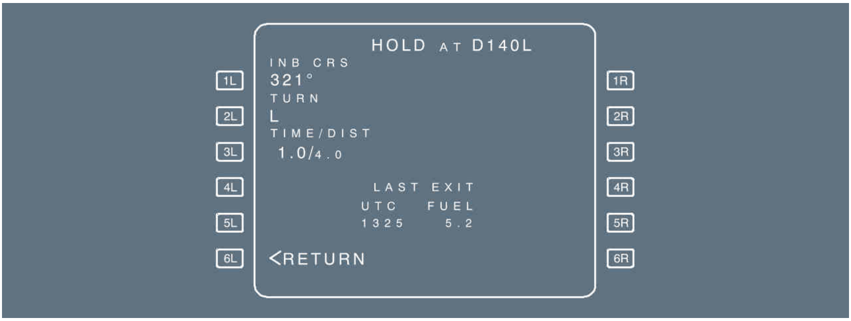
Before Deceleration

If an altitude constraint is defined at the hold entry fix, the FMGES duplicates this constraint on the hold exit.
However, different constraints may be inserted at the entry and exit fixes.
Although the hold is inserted into the flight plan, the FMGES does not take it into account for predictions until the aircraft enters the hold.
However, if the hold is not deleted by the crew, the FMGES schedules a deceleration point and displays it on the ND.



```
  FROM                       AI101→
           UTC      SPD/ALT
CLIFF      1248        / FL123
  BIG1A    BRG321°    16NM
D140L      1252  *250/  FL069
           HOLD
HOLD L      SPD   213
  C321°                 0
D140L      1252        /  FL069
  BIG1A                12
BIG        1255     250/  4480
  DEST      UTC     DIST  EFOB
EGLL27R    1302      51    6.1
                            ↑↓
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
D140L
SPEED CHANGE SYMBOL ASSOCIATED WITH THE HOLD
CLIFF



```
          HOLD AT D140L
INB CRS
321°
TURN
L
TIME/DIST
 1.0/4.0

            LAST EXIT
          UTC    FUEL
          1325    5.2

<RETURN
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

The FMGES predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding so as to comply with the fuel policy specified on the fuel prediction page. When the aircraft enters the holding pattern, the FMGES revises all predictions and assumes the aircraft will fly one turn of the holding pattern.

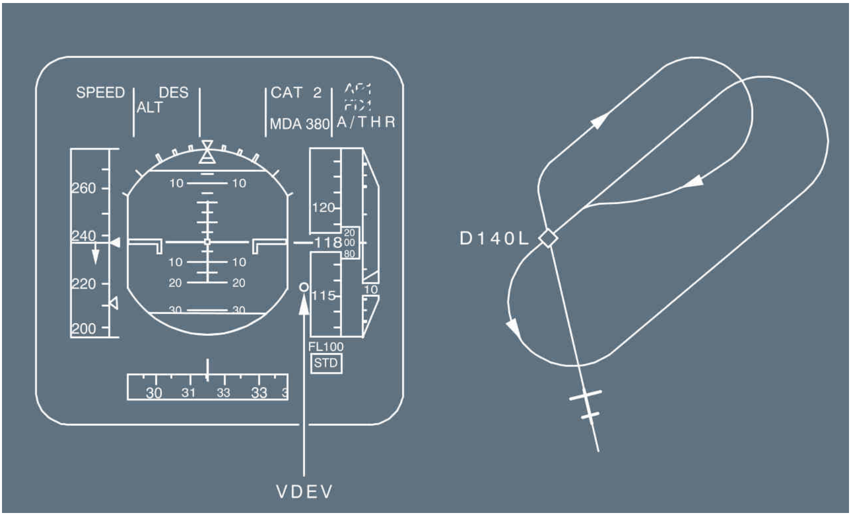
All predictions are revised if there is one additional holding pattern when the holding fix is overflown.

On Reaching the Speed Change Pseudo Waypoint

The FMGES either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays “SET HOLD SPD” (set hold speed) on the MCDU and primary flight display if the flight crew has selected a speed target.

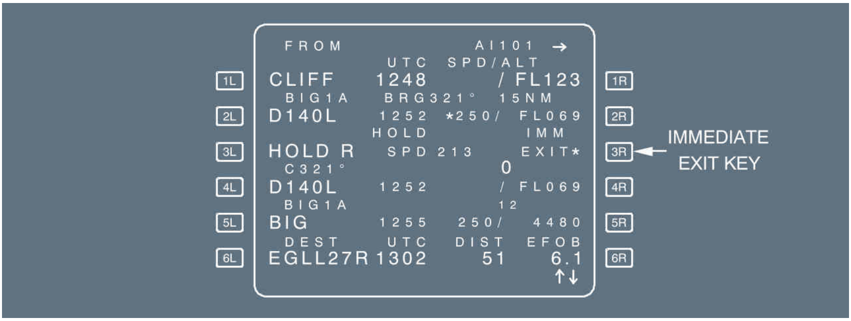
The default hold speed is the lowest of:
- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

When no specific speed limit applies, the default hold speed is the Maximum Endurance speed, which is approximately equal to Green Dot in clean configuration (it can vary between Green Dot and Green Dot +10 kt, depending on the aircraft weight, altitude and temperature). The flight plan predictions for time and fuel do not yet consider that the hold will be flown. However, the navigation display shows the hold entry and holding pattern trajectory.



Deceleration receives priority, so that when the aircraft is in descent with the descent mode engaged, it will deviate above the descent path to decelerate. (VDEV becomes positive on the progress page).
The flight plan page displays an immediate exit prompt.

If the flight crew presses the key next to “IMM EXIT” before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its phase-related managed-speed profile.



```
   FROM                 AI101  →
            UTC    SPD/ALT
CLIFF       1248        / FL123
   BIG1A     BRG321°     15NM
D140L       1252   *250/  FL069
            HOLD           IMM
HOLD R       SPD 213      EXIT*
   C321°                 0
D140L       1252        / FL069
   BIG1A                 12
BIG         1255    250/   4480
   DEST      UTC   DIST    EFOB
EGLL27R 1302        51      6.1
                            ↑↓
```

After Reaching the Hold Entry Fix

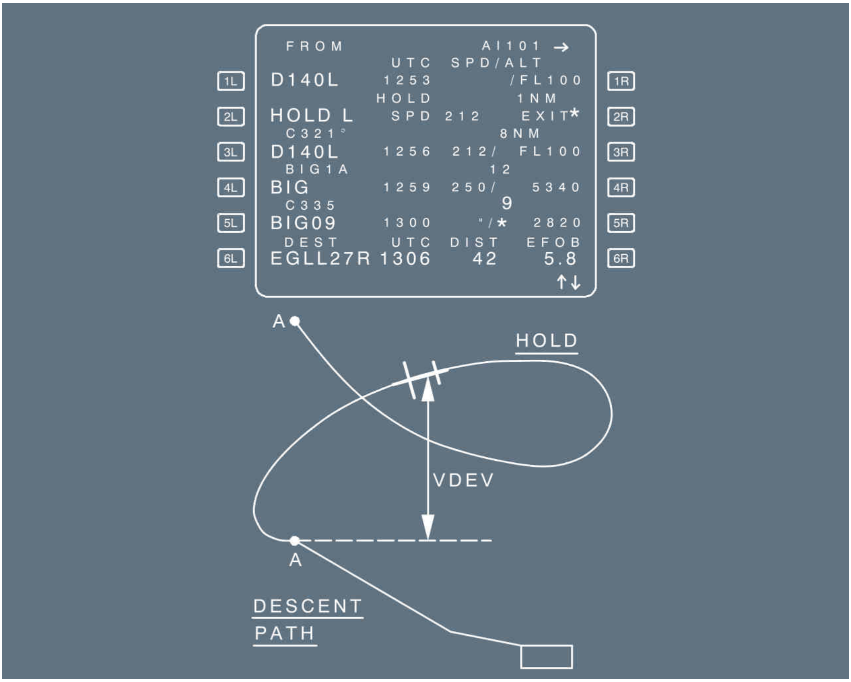
The aircraft enters the hold. The MCDU HOLD page displays the associated holding data:

- The inbound course (INB CRS)
- The TURN direction (L or R)
- The TIME/DIST
- The LAST EXIT time and the associated fuel to reach the alternate airport with no extra fuel.

The FMS assumes that the aircraft will fly one turn of the holding pattern, and revises the predictions accordingly.

When the holding pattern is defined by a leg time (and not a leg distance), the system revises the size of the hold as a function of the target speed:

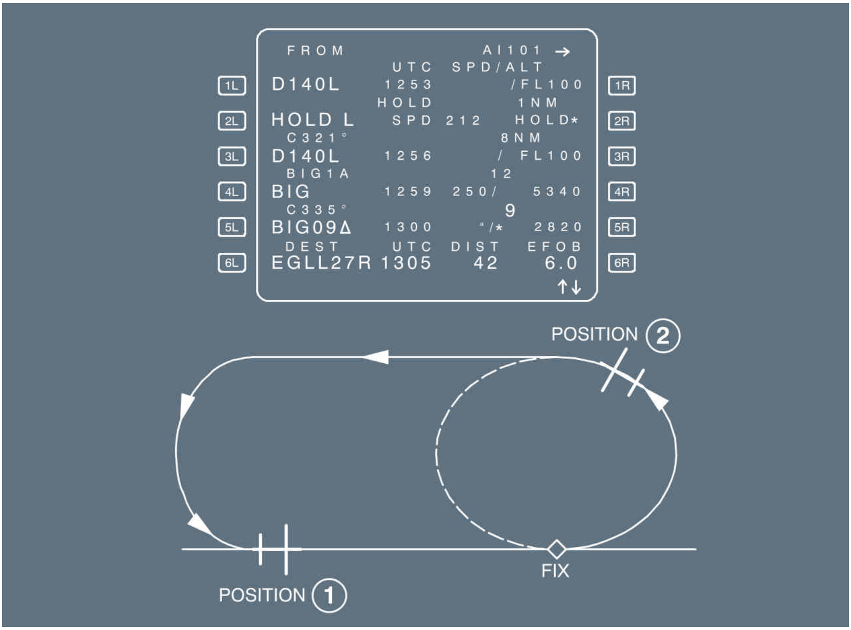
- If managed speed is active, the system uses the predicted holding speed to calculate the size of the holding pattern.
- If the selected speed is active, the system uses the target speed the flight crew selects at the entry fix sequencing to calculate the size of the holding pattern.
- The VDEV displayed on the primary flight display and the PROG page when the aircraft is flying in the HM (hold pattern with manual termination) is the difference between the aircraft's current altitude, and the altitude at which it should be, when it reaches the hold exit fix in order to be positioned correctly on the descent path.



```
  FROM                          AI101 →
                  UTC   SPD/ALT
D140L             1253            /FL100
                  HOLD              1NM
HOLD L            SPD 212          EXIT*
  C321°                          8NM
D140L             1256   212/     FL100
  BIG1A                        12
BIG               1259   250/      5340
  C335                          9
BIG09             1300    "/*      2820
  DEST            UTC    DIST      EFOB
EGLL27R 1306             42         5.8
                                     ↑↓
```

With IMM EXIT Pressed (Aircraft in the Holding Pattern)

The predictions and guidance assume that the aircraft is returning immediately to the hold fix. Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation. The flight plan page displays “RESUME HOLD*” instead of “IMM EXIT*”.



```
 FROM                      AI101 →
             UTC   SPD/ALT
D140L        1253        /FL100
             HOLD          1NM
HOLD L       SPD 212     HOLD*
 C321°                    8NM
D140L        1256        / FL100
 BIG1A                    12
BIG          1259  250/     5340
 C335°                    9
BIG09Δ       1300   "/*     2820
 DEST        UTC   DIST    EFOB
EGLL27R 1305        42      6.0
                             ↑↓
```

HOLD EXIT PROCEDURE

Position (1) If “IMM EXIT” pressed, aircraft will exit at next fix overfly.
Position (2) If “IMM EXIT” pressed, aircraft will make an immediate turn to the fix where hold will be exited.

- **If managed speed is active** , the computer sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit).

  The computer then bases its predictions on the assumption that the flight will continue on the descent path, if the aircraft is in a descent.

● **If DES mode is engaged**

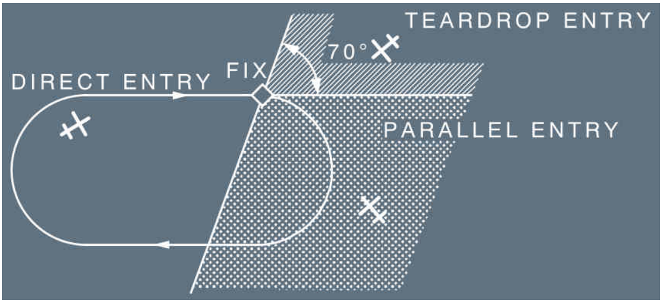
the following applies:
- The holding pattern is never included in the descent path computation.
- The flight crew cannot enter altitude and speed constraints at the hold exit fix (this is only allowed at the hold entry fix).
- The vertical guidance in the HM during the descent phase calls for a constant -1 000 ft/min, but the computer considers altitude constraints that will take effect farther down the flight path as it calculates vertical guidance and predictions. The system will not allow the aircraft to descend below the next altitude constraint. If the aircraft reaches the next altitude constraint, it will level off, and the altitude constraint mode will engage.

With Resume Hold Pressed

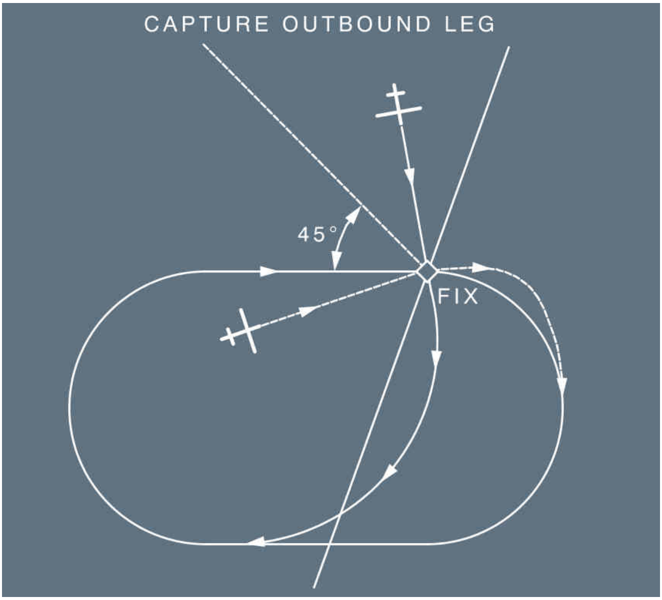
If the flight crew presses the key next to “RESUME HOLD”, the aircraft remains in the holding pattern, and the display again shows “IMM EXIT”.
After that, each time the aircraft flies over the holding fix, the system updates the predictions for one more holding circuit.

HOLDING PATTERN ENTRIES

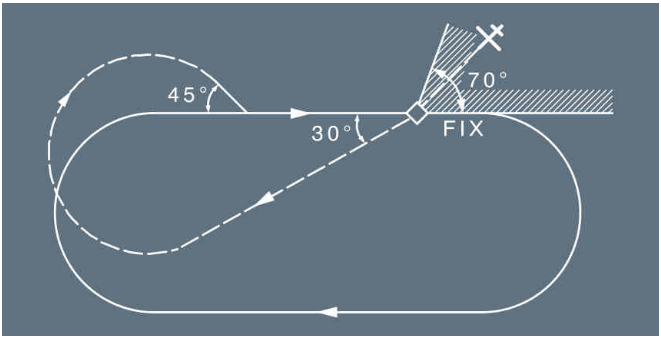
The FMGES offers three types of entry into holding patterns:
1. Direct entry
2. Teardrop entry
3. Parallel entry



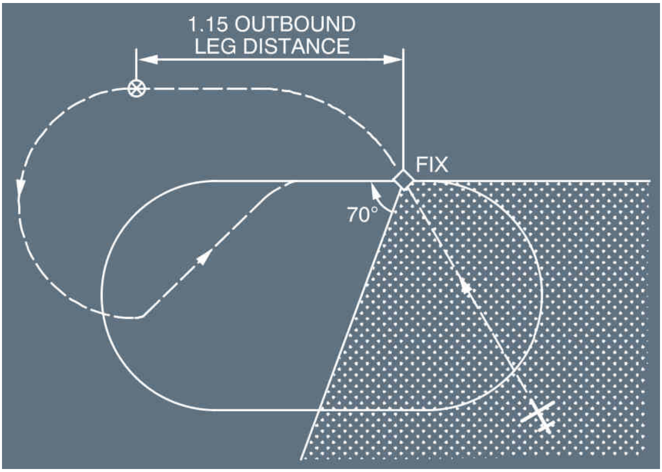
1. The Direct Entry


CAPTURE OUTBOUND LEG
45°
FIX

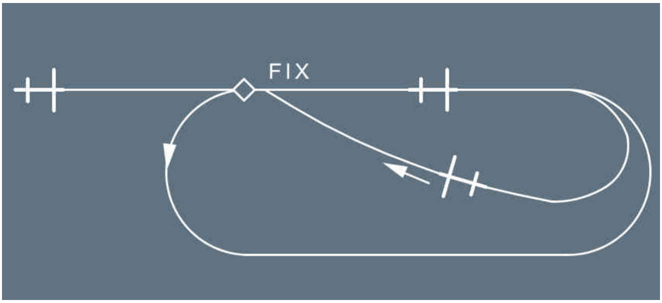
2. The Teardrop Entry



3. The Parallel Entry



Note: *If the leg the aircraft is flying toward the holding fix is on a “limit” between a teardrop entry and a parallel entry, the FMGEC may compute and display either of the two entries. The pilot should keep this in mind and not assume that the FMGEC is malfunctioning.*
If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a parallel entry.



Ident.: DSC-22_20-30-10-15-D-00009251.0001001 / 15 DEC 15
Applicable to: ALL

PROCEDURE TO INSERT A HOLD (HOLD WITH MANUAL TERMINATION)

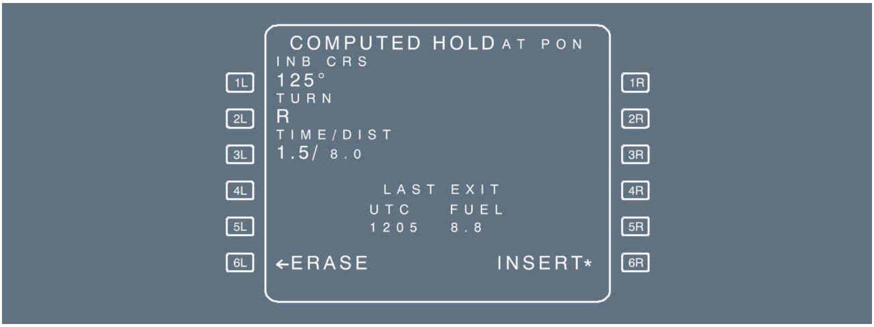
The HOLD prompt enables the crew to enter a holding pattern, with manual termination (HM), at the revised waypoint or at the present position.

The flight crew accesses the HOLD page from a lateral revision at the present position (PPOS) or at a waypoint.

SELECT lateral revision at present position (PPOS), or at an applicable waypoint.
PRESS the HOLD prompt [3L] key.

A TMPY F-PLN is created and if applicable, the database hold is proposed.
If no database hold is available, the computed hold is proposed.

CHECK and (if necessary) MODIFY the HOLD data
CHECK the temporary flight plan and INSERT it, if appropriate.



```
 COMPUTED HOLD AT PON
INB CRS
125°
TURN
R
TIME/DIST
1.5/ 8.0

          LAST  EXIT
          UTC   FUEL
          1205  8.8

←ERASE          INSERT*
```

Ident.: DSC-22_20-30-10-15-D-00009252.0001001 / 15 DEC 15
Applicable to: ALL

PROCEDURE TO DELETE A HOLD (HOLD WITH MANUAL TERMINATION)

CLEAR the HOLD directly in the flight plan as it can be done for a normal waypoint.

OFFSET

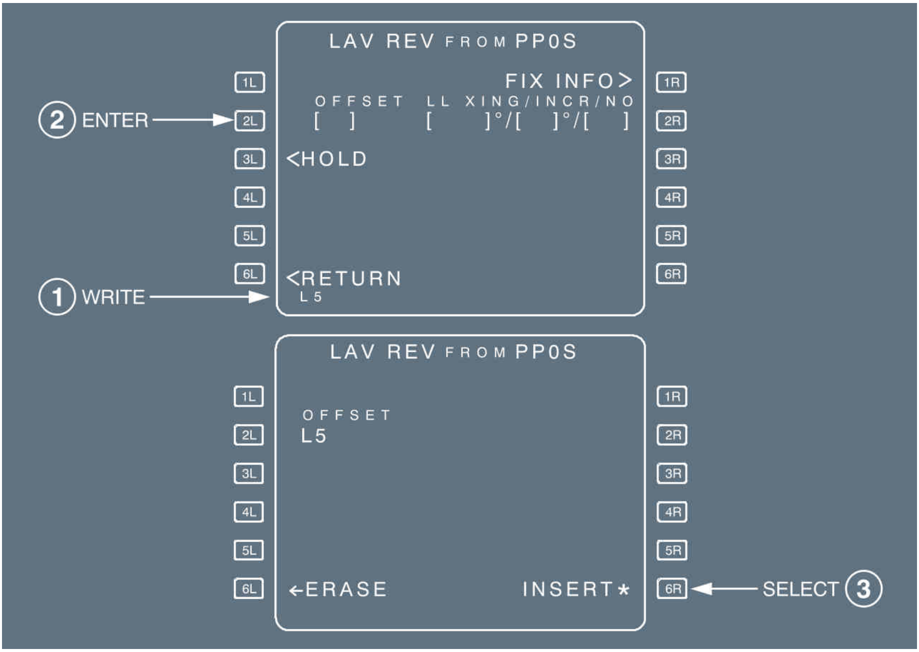
Ident.: DSC-22_20-30-10-15-E-00009253.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

The OFFSET prompt enables the crew to define a lateral offset to the left or right of the active flight plan. Once inserted, the offset applies from the present position (PPOS) all along the flight plan to the first waypoint (WPT) at which a holding pattern is defined, or to the last waypoint before the runway.
In most cases, the pilot will use it en route because of an ATC clearance or to avoid bad weather expected along the flight-plan route.
Accessed from lateral revision (LAT REV) at the present position page, an offset may be defined between 1 and 50 NM in one-nautical-mile steps.

After inserting the offset in the flight plan, the flight plan page shows OFST in its title, and the navigation display shows the offset flight plan in a solid green line and the original flight plan in a dashed green line.

The offset is cleared:
- Automatically (holding pattern, approach), or
- Manually with the clear (CLR) key.

Note: *If the crew enters an OFFSET when the aircraft is too close to the ending offset waypoint, the FMGES may refuse to accept it, in which case the MCDU displays the “ENTRY OUT OF RANGE” message.*


LAV REV FROM PPOS
FIX INFO>
OFFSET
LL XING/INCR/NO
[ ]
[ ]°/[ ]°/[ ]
<HOLD
<RETURN
L5
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
② ENTER
① WRITE
LAV REV FROM PPOS
OFFSET
L5
←ERASE
INSERT*
SELECT ③

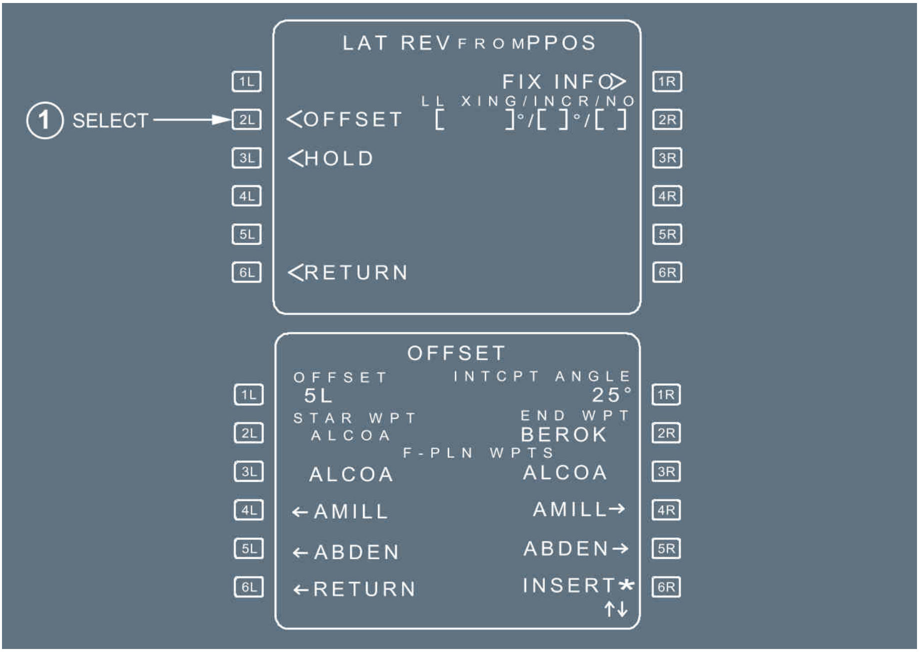
Ident.: DSC-22_20-30-10-15-E-00009253.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The OFFSET function enables the flight crew to define a lateral offset to the left or right of the active flight plan. The offset can be immediate or deferred to start on a downstream leg. The offset will end by default or at a pre-planned end waypoint. Additionally, the flight crew can specify the intercept angle used for the transitions to and from the offset path.

In most cases, the flight crew will use it en route because of an ATC clearance or to avoid bad weather expected along the flight-plan route.
The OFFSET page is accessed from the Lateral Revision (LAT REV) page at the FROM waypoint or at any waypoint downpath the flight plan, except the destination airport.
An offset may be defined between 1 and 50 NM in one-nautical-mile steps.
After inserting the offset in the flight plan, the flight plan page shows OFST in its title, left or right arrows are displayed on every label line between the start and end waypoints of the offset, and the Navigation Display (ND) shows the offset flight plan with a solid green line and the original flight plan with a dashed green line.

The offset is cleared:
- Automatically (holding pattern, approach), or
- Manually with the clear (CLR) key, or by entering "0" in the offset value field [1L], or by using the delete prompt on the OFFSET page.

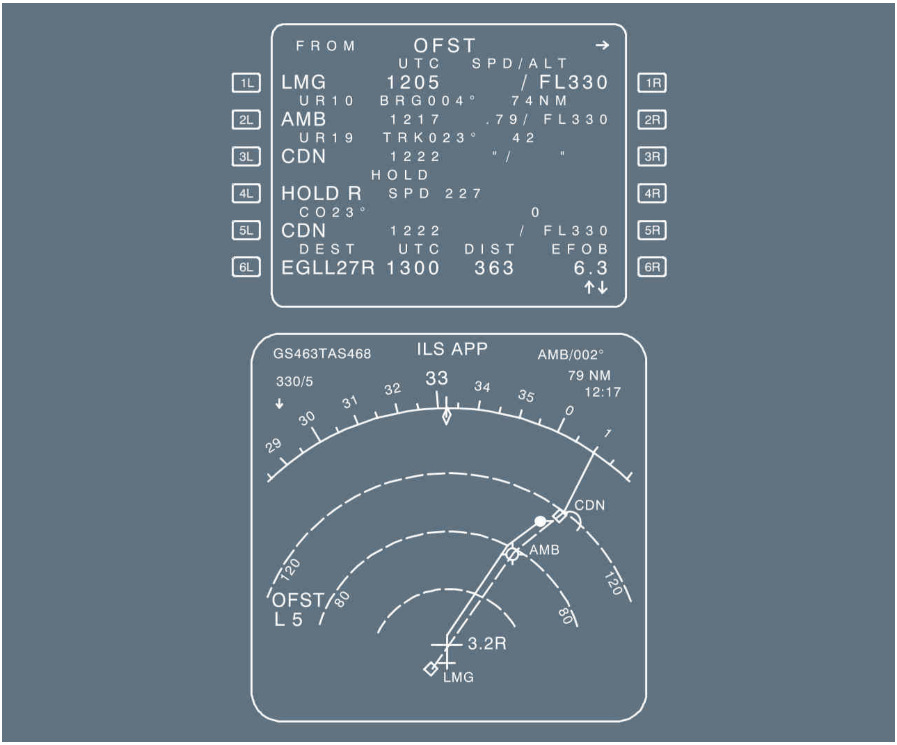
Note: *If the flight crew enters an offset when the aircraft is too close to the ending offset waypoint, the FMGES may refuse it. In that case the MCDU displays the “ENTRY OUT OF RANGE” message.*


LAT REV FROM PPOS
① SELECT
1L
2L
3L
4L
5L
6L
FIX INFO>
LL XING/INCR/NO
<OFFSET
[ ]°/[ ]°/[ ]
<HOLD
<RETURN
1R
2R
3R
4R
5R
6R
OFFSET
OFFSET
5L
INTCPT ANGLE
25°
STAR WPT
ALCOA
END WPT
BEROK
F-PLN WPTS
ALCOA
ALCOA
←AMILL
AMILL→
←ABDEN
ABDEN→
←RETURN
INSERT*
↑↓

Ident.: DSC-22_20-30-10-15-E-00009254.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

INSERTING AN OFFSET

SELECT LAT REV at the present position (PPOS)
WRITE the required offset value and direction (for example, L5 or 5L).
PRESS [2L] to enter the offset into the OFFSET field.
PRESS [6R] to activate the OFFSET.



```
FROM       OFST                →
           UTC     SPD/ALT
LMG        1205        / FL330
  UR10     BRG004°    74NM
AMB        1217    .79/ FL330
  UR19     TRK023°    42
CDN        1222     " /     "
         HOLD
HOLD R     SPD 227
  C023°                  0
CDN        1222        / FL330
  DEST     UTC   DIST    EFOB
EGLL27R    1300  363      6.3
                           ↑↓
```

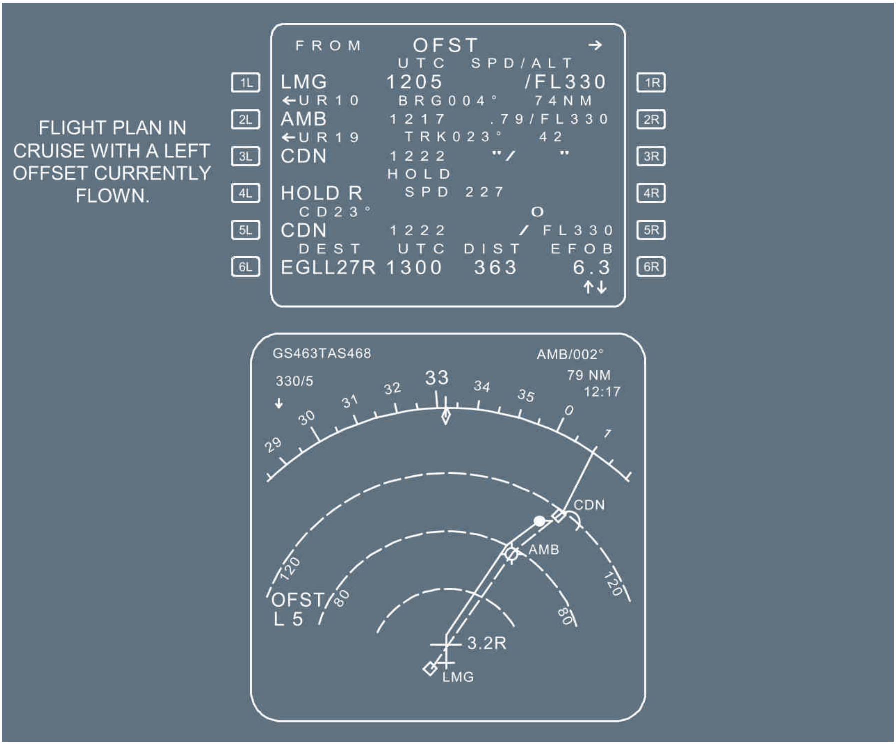
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GS463TAS468
ILS APP
AMB/002°
330/5
79 NM
12:17
29
30
31
32
33
34
35
0
1
CDN
AMB
120
80
OFST/
L 5
3.2R
LMG

Ident.: DSC-22_20-30-10-15-E-00009254.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

INSERTING AN OFFSET

SELECT LAT REV page at a waypoint.
SELECT OFFSET function by pressing [2L].
WRITE the required offset value and direction (for example, L5 or 5L), and enter it into [1L] field.

CHECK or INSERT the START WPT from the list in [3L] - [5L] fields or manually enter it.
CHECK or ENTER the INTCPT ANGLE in [1R] field.
CHECK OR INSERT the END WPT from the list in [3R] - [5R] fields or manually enter it.
PRESS INSERT in [6R] field to activate the OFFSET.



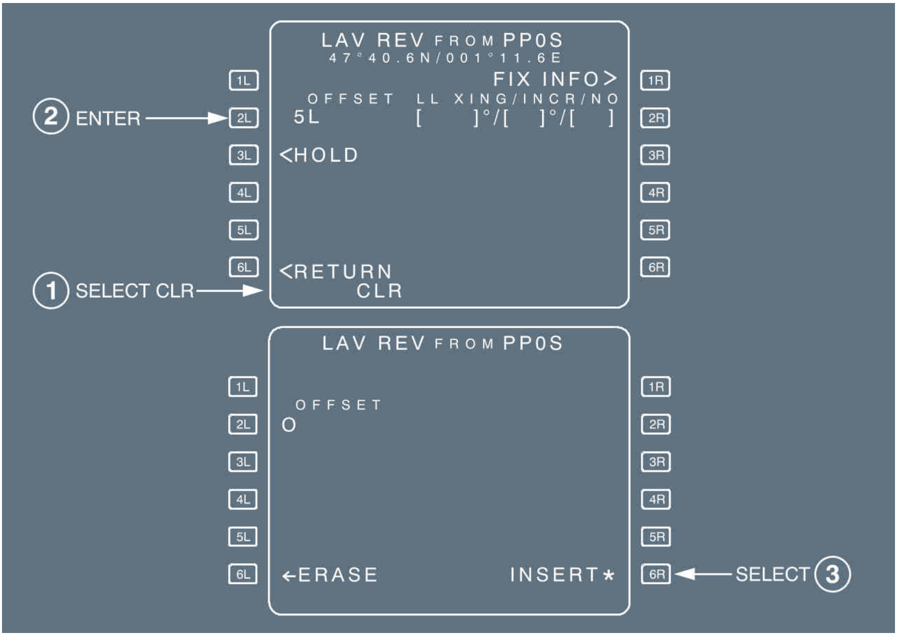
FLIGHT PLAN IN CRUISE WITH A LEFT OFFSET CURRENTLY FLOWN.

```
 FROM        OFST               →
           UTC    SPD/ALT
LMG       1205         /FL330
←UR10      BRG004°      74NM
AMB        1217     .79/FL330
←UR19       TRK023°     42
CDN        1222       "/     "
          HOLD
HOLD R      SPD 227
  CD23°                 O
CDN        1222          / FL330
  DEST     UTC  DIST    EFOB
EGLL27R 1300   363      6.3
                           ↑↓
```

MANUAL CANCELLATION OF OFFSET

There are two standard methods of cancelling an offset :
1. SELECT DIR TO a waypoint (the next waypoint, for example)
2. SELECT a Lateral Revision (LAT REV) at FROM WPT

CLEAR the OFFSET field.
PRESS [6R] to activate the temporary flight plan (cancelling OFFSET).

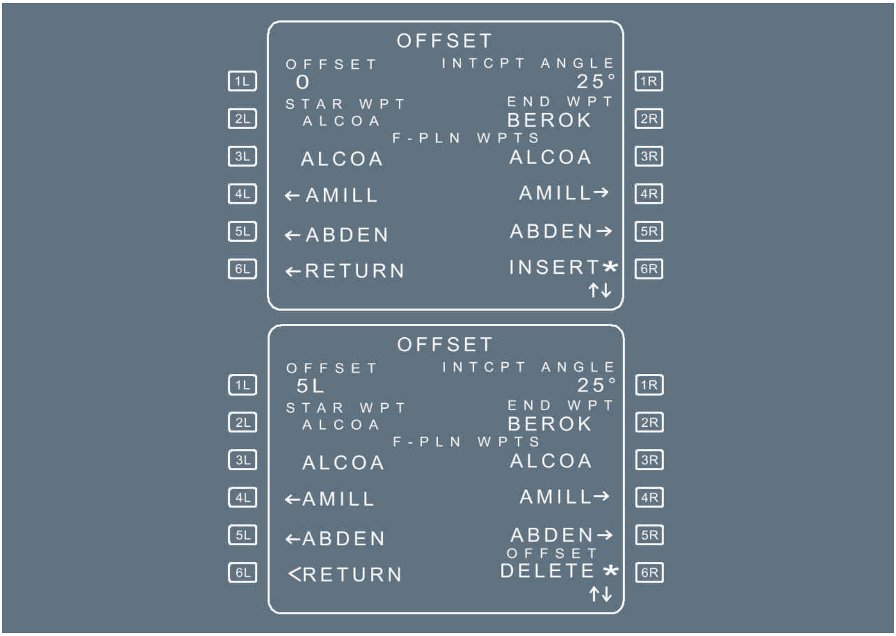

LAV REV FROM PPOS
47°40.6N/001°11.6E
FIX INFO>
OFFSET
LL XING/INCR/NO
5L
[ ]°/[ ]°/[ ]
<HOLD
<RETURN
CLR
② ENTER
① SELECT CLR
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LAV REV FROM PPOS
OFFSET
0
←ERASE
INSERT*
SELECT ③

Ident.: DSC-22_20-30-10-15-E-00009255.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MANUAL CANCELLATION OF AN OFFSET

There are two standard methods for cancelling an offset:

1. SELECT DIR TO a waypoint (the next waypoint, for example).
2. SELECT a Lateral Revision (LAT REV) at FROM WPT.
   CLEAR the OFFSET field or enter “0” in the OFFSET value field [1L], and press INSERT* in [6R] to activate the temporary flight plan (cancelling OFFSET), or
   PRESS the OFFSET DELETE prompt [6R] to activate the temporary flight plan (cancelling OFFSET).



OFFSET
OFFSET 0 | INTCPT ANGLE 25°
STAR WPT ALCOA | END WPT BEROK
F-PLN WPTS
ALCOA | ALCOA
←AMILL | AMILL→
←ABDEN | ABDEN→
←RETURN | INSERT*
↑↓

OFFSET
OFFSET 5L | INTCPT ANGLE 25°
STAR WPT ALCOA | END WPT BEROK
F-PLN WPTS
ALCOA | ALCOA
←AMILL | AMILL→
←ABDEN | ABDEN→
<RETURN | OFFSET DELETE *
↑↓

ALTERNATE FUNCTION

Ident.: DSC-22_20-30-10-15-F-00009256.0001001 / 15 FEB 11
Applicable to: ALL

The ALTERNATE FUNCTION performs two actions :
- It reviews and defines alternate airports and inserts them into the flight plan.
- It allows a diversion to be activated through the ENABLE ALTN command.

Ident.: DSC-22_20-30-10-15-F-00009257.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

REVIEW AND SELECTION OF ALTERNATE AIRPORT

Several alternate airfields may be stored in the database and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.
The pilot may review the alternate airports on the ALTN page, and if the one selected is not suitable because of weather or fuel considerations, another alternate may be strung into the active flight plan.
The pilot may define an additional alternate airport into the list, if necessary.

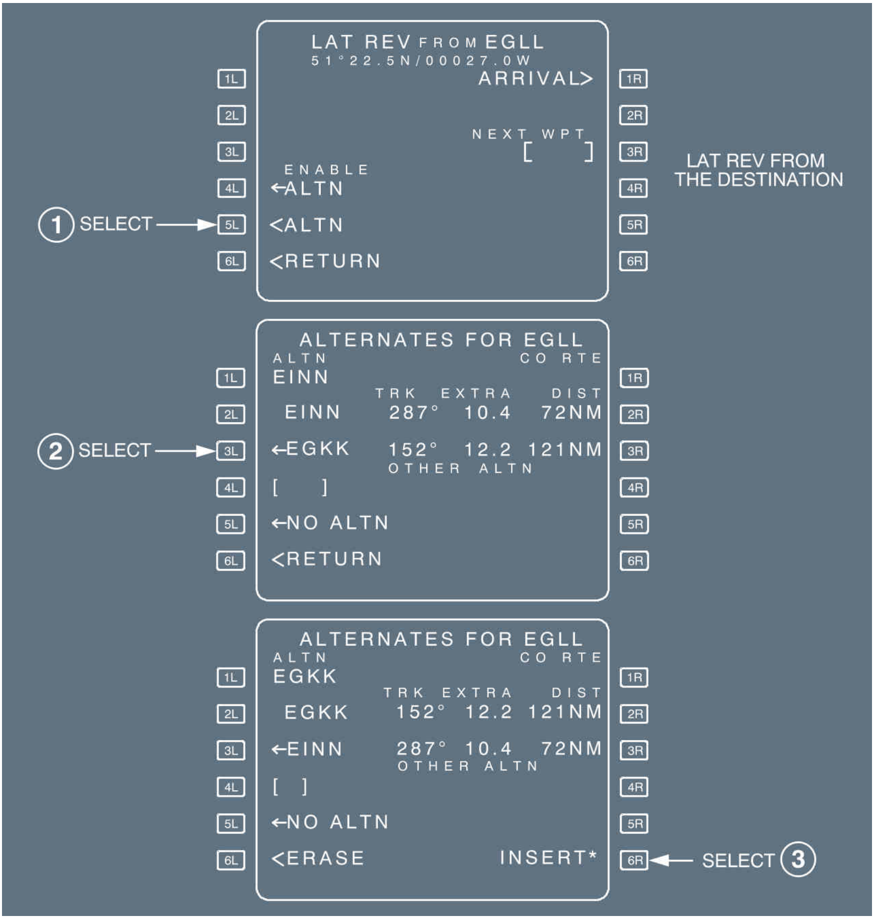
The ALTERNATE page shows the track and distance (airway or direct) between destination and alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot to change the preferred alternate, if necessary. Access the ALTERNATE page through the ALTN prompt on LAT REV page at destination. The alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

If the preferred alternate is not suitable, proceed as follows :

SELECT F-PLN key on MCDU
SELECT LAT REV at destination.
SELECT ALTN [5L] key.
SELECT an AIRFIELD IDENTIFIER
INSERT the temporary flight plan

Note: *If weather and destination airfield conditions allow it, you may select “NO ALTN”, fuel predictions will be computed without alternate fuel.*



```
    LAT REV FROM EGLL
    51°22.5N/00027.0W
                       ARRIVAL>

                       NEXT WPT
                       [      ]
  ENABLE
←ALTN

<ALTN

<RETURN
```

```
   ALTERNATES FOR EGLL
ALTN                   CO RTE
EINN
             TRK  EXTRA   DIST
  EINN       287°  10.4   72NM

←EGKK        152°  12.2  121NM
             OTHER ALTN
[    ]

←NO ALTN

<RETURN
```

```
   ALTERNATES FOR EGLL
ALTN                   CO RTE
EGKK
             TRK  EXTRA   DIST
  EGKK       152°  12.2  121NM

←EINN        287°  10.4   72NM
             OTHER ALTN
[  ]

←NO ALTN

<ERASE               INSERT*
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LAT REV FROM THE DESTINATION
① SELECT
② SELECT
SELECT ③

SELECTION OF OTHER ALTERNATE

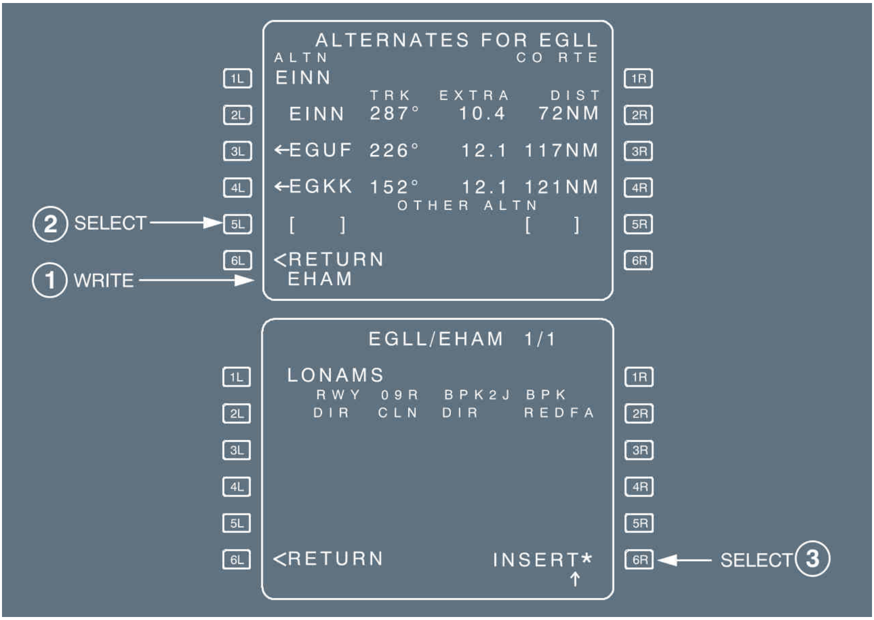
Fuel management information for flight to another alternate airfield may be obtained by selecting the OTHER ALTN field.

SELECT LAT REV at DESTINATION.
SELECT ALTN [5L] key.
ENTER the airfield identifier in the brackets.

- *If the airfield is not in the database, the NEW RUNWAY page automatically appears.*
- *If the airfield is in the database and there is a company route (CO RTE) to it, the ROUTE SELECTION page automatically appears.*

SELECT the route, as appropriate, or RETURN to the ALTN page.
ENTER the distance into the brackets (if required). XTRA fuel and track (TRK) will appear.
SELECT the other alternate (OTHER ALTN) as a primary alternate, if convenient. (EXTRA fuel and DIST revert to AIRWAY distance).
INSERT it, if you want to have it as a primary alternate.

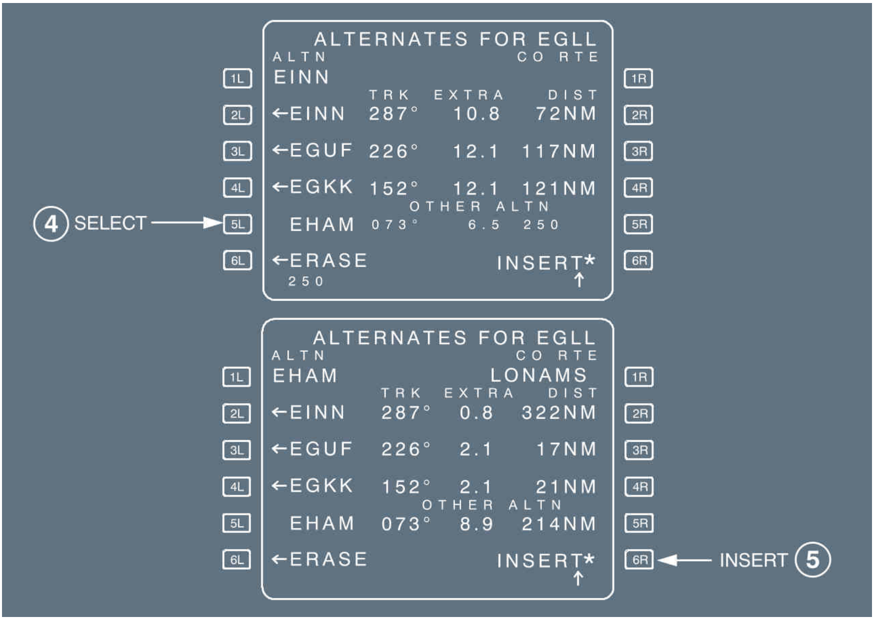
Note:
- *The pilot can always overwrite the “OTHER ALTN”. The new “OTHER ALTN” then replaces the previous one, which is lost.*
- *The pilot can select OTHER ALTN as a primary alternate (active flight plan), to replace any alternate on the initial list.*
- *If the pilot selects the other alternate as a primary alternate, and overwrites the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN .*



```
    ALTERNATES FOR EGLL
ALTN                    CO RTE
EINN
             TRK   EXTRA    DIST
 EINN       287°   10.4     72NM
←EGUF       226°   12.1    117NM
←EGKK       152°   12.1    121NM
              OTHER ALTN
 [    ]                 [    ]
<RETURN
 EHAM
```

```
        EGLL/EHAM   1/1
 LONAMS
   RWY   09R   BPK2J  BPK
   DIR   CLN   DIR    REDFA




<RETURN               INSERT*
                          ↑
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
② SELECT
① WRITE
SELECT ③



```
   ALTERNATES FOR EGLL
ALTN                CO RTE
EINN
         TRK   EXTRA    DIST
←EINN    287°   10.8    72NM
←EGUF    226°   12.1   117NM
←EGKK    152°   12.1   121NM
            OTHER ALTN
 EHAM    073°    6.5    250
←ERASE               INSERT*
 250                       ↑
```

```
   ALTERNATES FOR EGLL
ALTN                CO RTE
EHAM               LONAMS
         TRK   EXTRA    DIST
←EINN    287°    0.8   322NM
←EGUF    226°    2.1    17NM
←EGKK    152°    2.1    21NM
            OTHER ALTN
 EHAM    073°    8.9   214NM
←ERASE               INSERT*
                           ↑
```

The pilot may enter a distance in OTHER ALTN field. The system will compute the extra fuel, and the track for this distance.

PREDICTED DATA FOR ALTERNATE

Data predictions are based on :

- Aircraft weight being equal to landing weight at the primary destination.
- Flight at flight level 220, if the airway distance is less than 200 NM; otherwise, at flight level 310.
- Cost index 0
- Constant wind (as entered in the alternate field of the DES WIND page).
- Constant delta ISA (equal to delta ISA at primary destination)
- Airway distance for a company route, otherwise direct distance manually entered by the pilot in OTHER ALTN field (used only for preliminary predictions).

Ident.: DSC-22_20-30-10-15-F-00009257.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

REVIEW AND SELECTION OF ALTERNATE AIRPORT

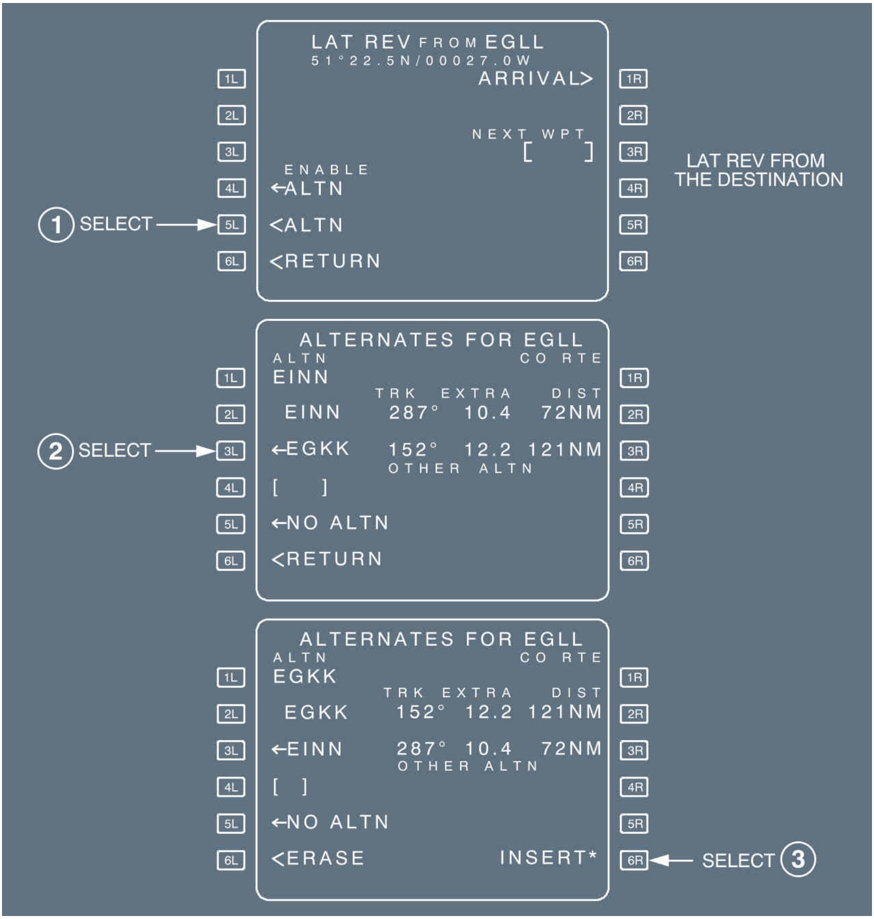
Several alternate airfields may be stored in the database and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.
The pilot may review the alternate airports on the ALTN page, and if the one selected is not suitable because of weather or fuel considerations, another alternate may be strung into the active flight plan.
The pilot may define an additional alternate airport into the list, if necessary.
The ALTERNATE page shows the track and distance (airway or direct) between destination and alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot to change the preferred alternate, if necessary.
Access the ALTERNATE page through the ALTN prompt on LAT REV page at destination. The alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

If the preferred alternate is not suitable, proceed as follows :

SELECT F-PLN key on MCDU
SELECT LAT REV at destination.
SELECT ALTN [5L] key.
SELECT an AIRFIELD IDENTIFIER
INSERT the temporary flight plan

Note: *If weather and destination airfield conditions allow it, you may select “NO ALTN”, fuel predictions will be computed without alternate fuel.*



```
      LAT REV FROM EGLL
      51°22.5N/00027.0W
                        ARRIVAL>

                      NEXT WPT
                      [       ]
  ENABLE
←ALTN

<ALTN

<RETURN
```

```
   ALTERNATES FOR EGLL
ALTN                    CO RTE
EINN
            TRK   EXTRA    DIST
 EINN       287°   10.4    72NM

←EGKK       152°   12.2   121NM
            OTHER ALTN
[     ]

←NO ALTN

<RETURN
```

```
   ALTERNATES FOR EGLL
ALTN                    CO RTE
EGKK
            TRK   EXTRA    DIST
 EGKK       152°   12.2   121NM

←EINN       287°   10.4    72NM
             OTHER ALTN
[  ]

←NO ALTN

<ERASE               INSERT*
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LAT REV FROM THE DESTINATION
1 SELECT
2 SELECT
SELECT 3

SELECTION OF OTHER ALTERNATE

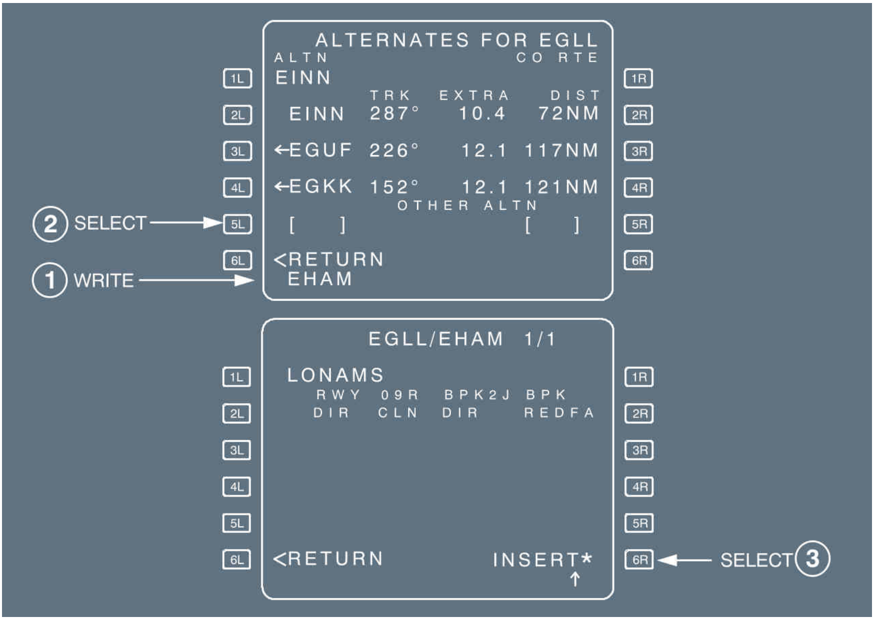
Fuel management information for flight to another alternate airfield may be obtained by selecting the OTHER ALTN field.

SELECT LAT REV at DESTINATION.
SELECT ALTN [5L] key.
ENTER the airfield identifier in the brackets.

- *If the airfield is not in the database, the NEW RUNWAY page automatically appears.*
- *If the airfield is in the database and there is a company route (CO RTE) to it, the ROUTE SELECTION page automatically appears.*

SELECT the route, as appropriate, or RETURN to the ALTN page.
ENTER the distance into the brackets (if required). XTRA fuel and track (TRK) will appear.
SELECT the other alternate (OTHER ALTN) as a primary alternate, if convenient. (EXTRA fuel and DIST revert to AIRWAY distance).
INSERT it, if you want to have it as a primary alternate.

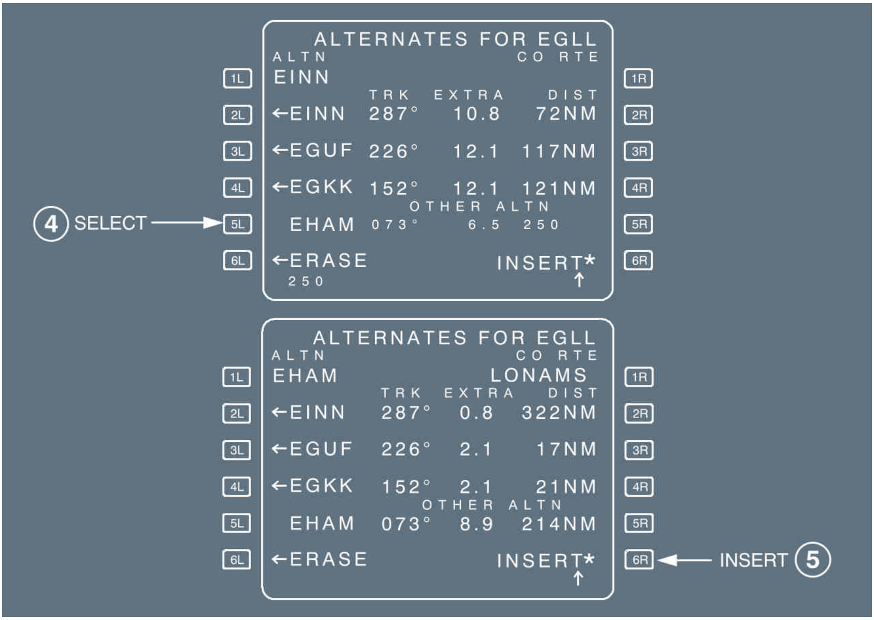
Note:
- *The pilot can always overwrite the “OTHER ALTN”. The new “OTHER ALTN” then replaces the previous one, which is lost.*
- *The pilot can select OTHER ALTN as a primary alternate (active flight plan), to replace any alternate on the initial list.*
- *If the pilot selects the other alternate as a primary alternate, and overwrites the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN .*



```
     ALTERNATES FOR EGLL
ALTN                    CO RTE
EINN
          TRK    EXTRA    DIST
 EINN     287°    10.4    72NM
←EGUF     226°    12.1   117NM
←EGKK     152°    12.1   121NM
            OTHER ALTN
 [    ]                [    ]
<RETURN
 EHAM
```

```
        EGLL/EHAM   1/1

 LONAMS
    RWY   09R   BPK2J   BPK
    DIR   CLN   DIR     REDFA




<RETURN              INSERT*
                          ↑
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
2 SELECT
1 WRITE
SELECT 3



```
    ALTERNATES FOR EGLL
ALTN                  CO RTE
EINN
       TRK   EXTRA     DIST
←EINN  287°   10.8     72NM
←EGUF  226°   12.1    117NM
←EGKK  152°   12.1    121NM
          OTHER ALTN
 EHAM  073°    6.5    250
←ERASE               INSERT*
  250                      ↑
```

```
    ALTERNATES FOR EGLL
ALTN                  CO RTE
EHAM                  LONAMS
       TRK   EXTRA     DIST
←EINN  287°    0.8    322NM
←EGUF  226°    2.1     17NM
←EGKK  152°    2.1     21NM
          OTHER ALTN
 EHAM  073°    8.9    214NM
←ERASE               INSERT*
                           ↑
```

The pilot may enter a distance in OTHER ALTN field. The system will compute the extra fuel, and the track for this distance.

PREDICTED DATA FOR ALTERNATE

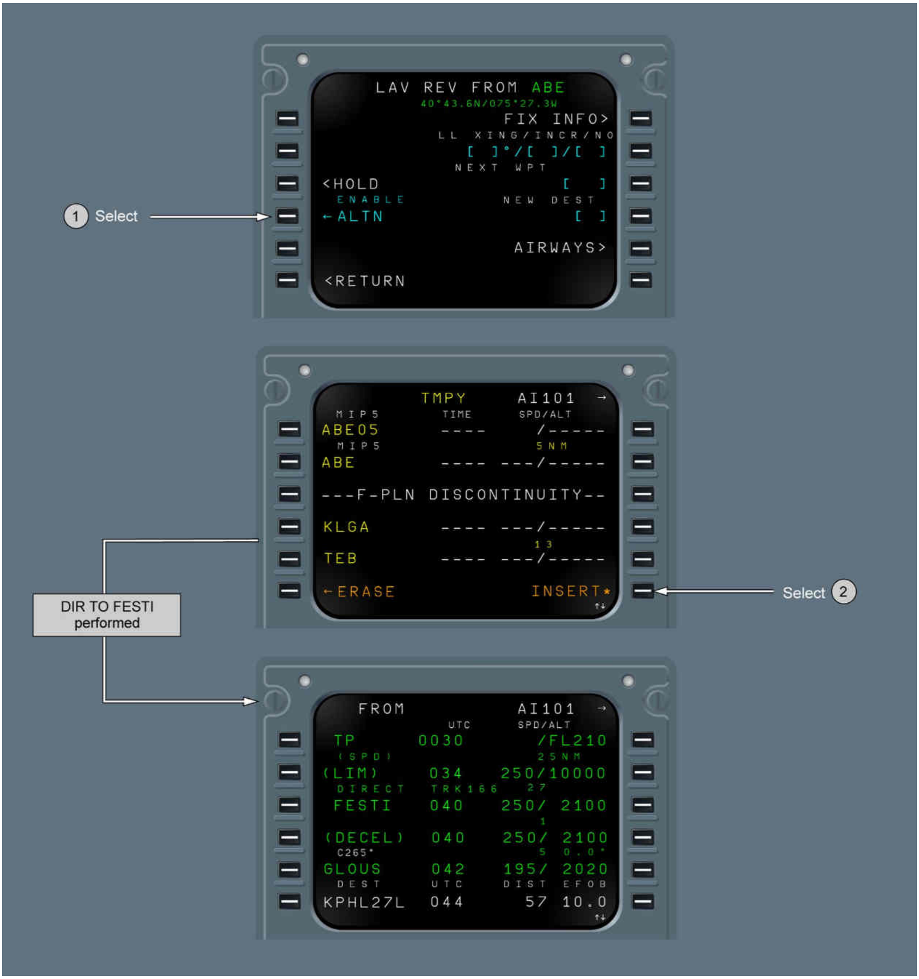
Data predictions are based on :

- Aircraft weight being equal to landing weight at the primary destination.
- Flight at FL 100, if the alternate F-PLN length is less than 100 NM; at FL 220 if the alternate F-PLN length is comprised between 100 NM and 200 NM; at FL 310 otherwise.
- Cost index 0
- Constant wind (as entered in the alternate field of the DES WIND page).
- Constant delta ISA (equal to delta ISA at primary destination)
- The along flight path distance from the destination to the alternate airport. If the flight crew enters an ALTN fuel value, this value is the one taken into account.

ENABLE ALTN

Ident.: DSC-22_20-30-10-15-00009258.0001001 / 03 MAY 23
Applicable to: ALL

This enables the flight crew to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity).
The flight crew may have to adjust the resulting flight plan (use “direct to”, or add or suppress waypoints), depending on the circumstances.



```
 LAV REV FROM ABE
40°43.6N/075°27.3W
                FIX INFO>
  LL XING/INCR/NO
   [ ]°/[ ]/[ ]
       NEXT WPT
<HOLD            [ ]
 ENABLE     NEW DEST
←ALTN            [ ]
              AIRWAYS>
<RETURN
```

```
      TMPY       AI101  →
 MIP5   TIME    SPD/ALT
ABE05   ----     /-----
 MIP5             5NM
ABE     ----  ---/-----
---F-PLN DISCONTINUITY--
KLGA    ----  ---/-----
                 13
TEB     ----  ---/-----
←ERASE          INSERT*
                     ↑↓
```

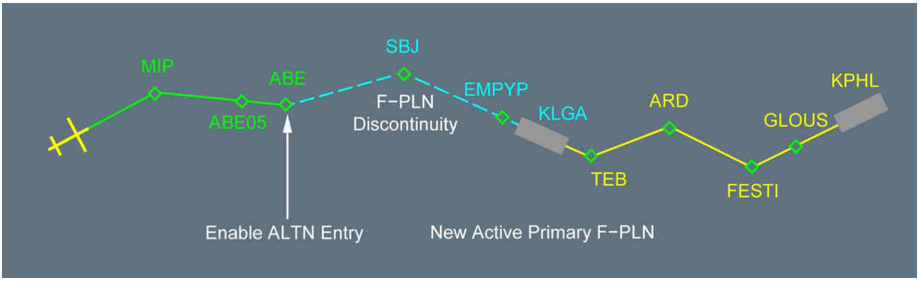
```
   FROM          AI101  →
          UTC   SPD/ALT
 TP      0030    /FL210
  (SPD)           25NM
(LIM)     034  250/10000
  DIRECT  TRK166   27
 FESTI    040  250/ 2100
                   1
(DECEL)   040  250/ 2100
  C265°           5  0.0°
GLOUS     042  195/ 2020
  DEST    UTC  DIST  EFOB
KPHL27L   044   57  10.0
                     ↑↓
```

TO ACTIVATE THE PRIMARY ALTN:

SELECT a LAT REV at the TO waypoint (or at another suitable waypoint).
SELECT the ENABLE ALTN.
INSERT the temporary F-PLN.

L2 *The temporary flight plan is created and displayed.*

L1 ENTER an appropriate waypoint in DIRECT TO and adjust the flight plan.
ADJUST the cost index on the PERF page and the defaulted CRZ FL on the PROG page, as required.



When ENABLE ALTN is selected at ABE, a flight plan discontinuity is created from ABE down to destination and the alternate route is linked to the active flight plan.

DIR KEY (DIRECT-TO-FUNCTION)

Ident.: DSC-22_20-30-10-15-G-00009259.0001001 / 03 APR 18
Applicable to: ALL

GENERAL

The pilot uses the “Direct To” function to define a direct leg from the present position to any waypoint on the active flight plan or to any waypoint.
The designated waypoint may be entered by its identifier (if it is stored in the database) or by a latitude/longitude, place/bearing/distance, or a place-bearing/place-bearing.

Note: 1. *If the autopilot or flight director is in the heading/track or localizer mode, the DIR TO function engages NAV mode.*
2. *A lateral revision of the flight plan obtained with a DIR TO may also affect the vertical profile of the flight plan.*

Three functions are available through the DIR TO key :
- the DIR TO defines a direct leg from present position to a specified waypoint.
  NAV mode engages simultaneously to the DIR TO selection.
  When the pilot uses DIR TO, the present position (PPOS) becomes the “FROM” waypoint and the active flight plan shows it as T-P (turn point).
- the DIR TO/ABEAM function, defines the abeam waypoints along the direct leg. These waypoints are the projection on the direct leg of the initial F-PLN waypoints, located between the aircraft position and the specified waypoint.
  NAV mode engages simultaneously to the DIR TO/ABEAM selection.
- the DIR TO/INTCPT function allows to define a specified RADIAL INBOUND or OUTBOUND an inserted waypoint. The current aircraft track is used to compute the INTCPT point with the specified radial.
  NAV mode is armed simultaneously to the DIR TO/INTCPT selection.

The ND displays the DIR TO leg as a temporary flight plan leg, between current aircraft position and specified waypoint. In case of a DIR TO/INTCPT the leg is not displayed when the angle between the current aircraft track and the intercept radial exceeds 160 °.

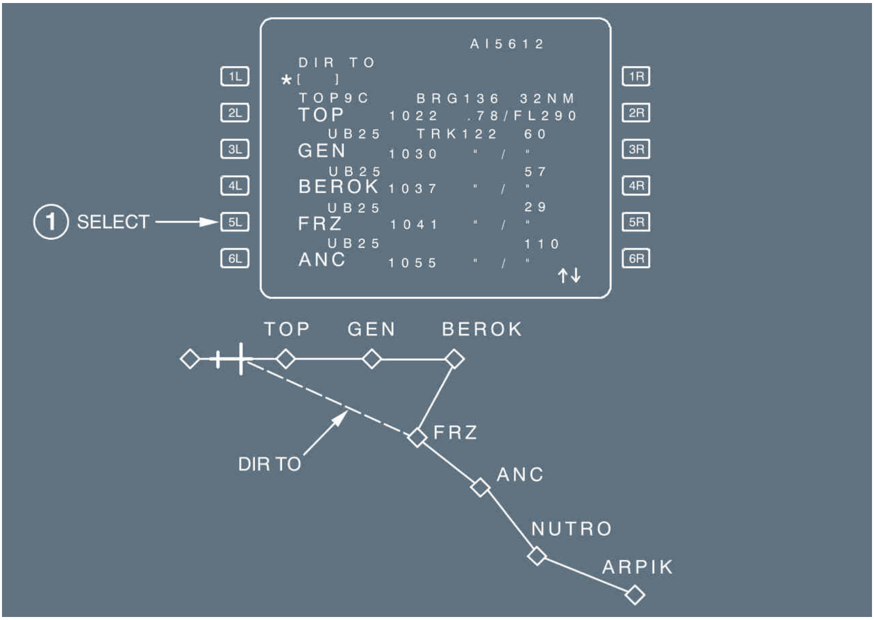
Ident.: DSC-22_20-30-10-15-G-00009260.0001001 / 14 MAY 12
Applicable to: ALL

PROCEDURE FOR DIR TO WAYPOINT

CASE 1. THE "TO" WAYPOINT IS IN THE FLIGHT PLAN

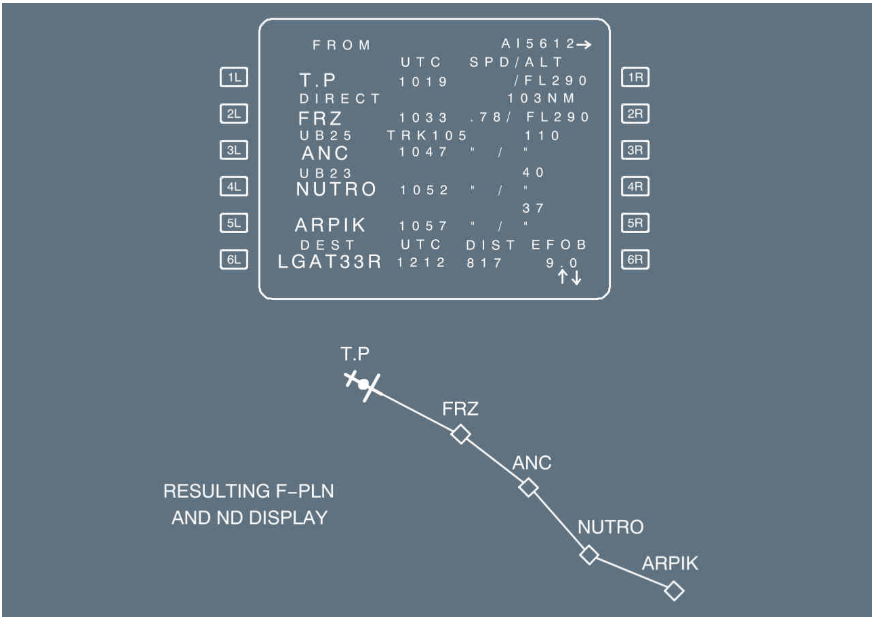
Example: DIR TO FRZ

PRESS the DIR key on the MCDU.
PRESS the line select key next to “FRZ”



```
                     AI5612
 DIR TO
*[    ]
 TOP9C       BRG136  32NM
 TOP    1022    .78/FL290
     UB25    TRK122   60
 GEN    1030    "  /  "
     UB25             57
 BEROK  1037    "  /  "
     UB25             29
 FRZ    1041    "  /  "
     UB25             110
 ANC    1055    "  /  "
                        ↑↓
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
① SELECT
TOP
GEN
BEROK
FRZ
DIR TO
ANC
NUTRO
ARPIK



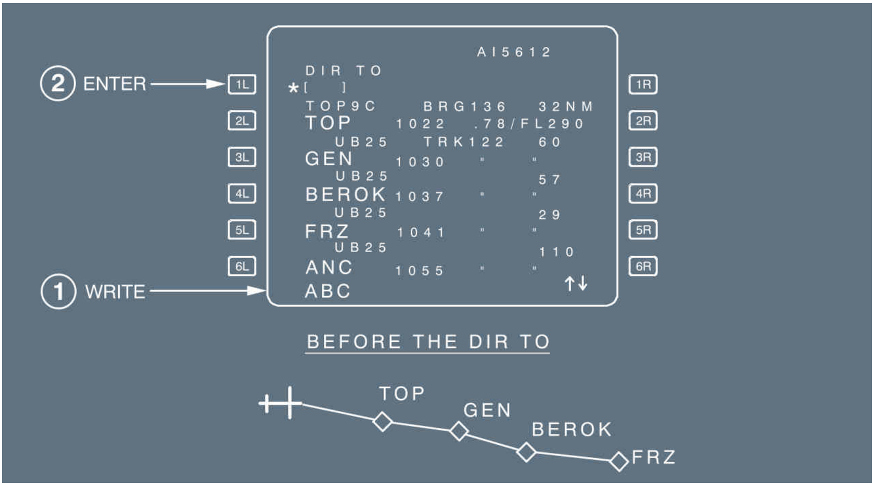
```
 FROM                      AI5612→
            UTC      SPD/ALT
 T.P        1019          /FL290
 DIRECT                  103NM
 FRZ        1033    .78/ FL290
 UB25      TRK105          110
 ANC        1047     "  /  "
 UB23                      40
 NUTRO      1052     "  /  "
                           37
 ARPIK      1057     "  /  "
 DEST       UTC     DIST  EFOB
LGAT33R     1212    817    9.0
                            ↑↓
```

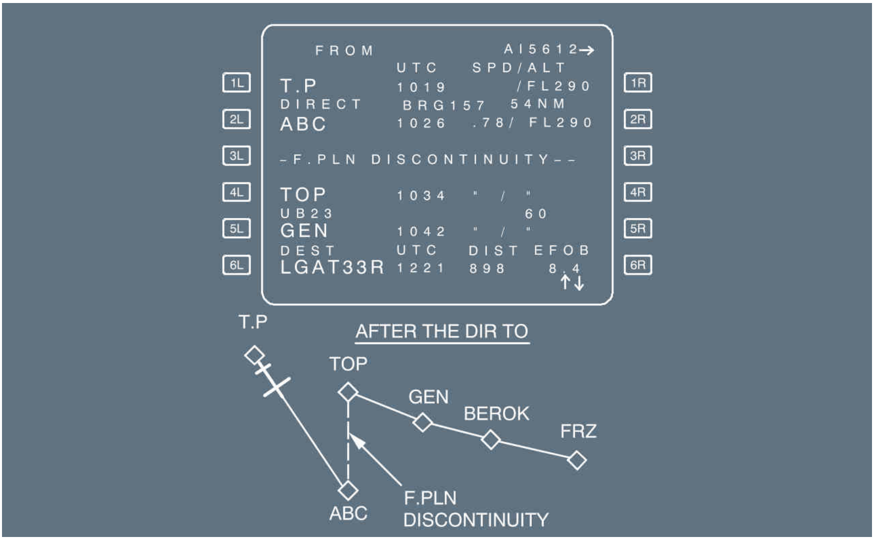
RESULTING F-PLN AND ND DISPLAY

CASE 2. THE "TO" WAYPOINT DOES NOT BELONG TO THE FLIGHT PLAN

<u>Example:</u> Direct to ABC (ABC being an IDENT, AxxByyy or PBD or PBX)

PRESS the DIR key.
WRITE the waypoint identifier (e.g. ABC) in the scratchpad.
PRESS [1 L] to enter “ABC” in the “DIR TO” field.


② ENTER
① WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
AI5612
DIR TO
*[ ]
TOP9C BRG136 32NM
TOP 1022 .78/FL290
UB25 TRK122 60
GEN 1030 " "
UB25 57
BEROK 1037 " "
UB25 29
FRZ 1041 " "
UB25 110
ANC 1055 " "
ABC
↑↓
BEFORE THE DIR TO
TOP
GEN
BEROK
FRZ

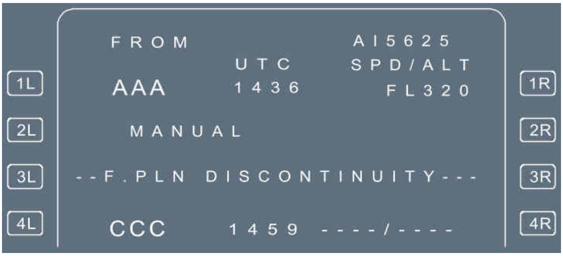

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FROM AI5612→
UTC SPD/ALT
T.P 1019 /FL290
DIRECT BRG157 54NM
ABC 1026 .78/ FL290
-F.PLN DISCONTINUITY--
TOP 1034 " / "
UB23 60
GEN 1042 " / "
DEST UTC DIST EFOB
LGAT33R 1221 898 8.4
↑↓
T.P
AFTER THE DIR TO
TOP
GEN
BEROK
FRZ
ABC
F.PLN
DISCONTINUITY

Clear the discontinuity and the waypoints that are not included in the new flight plan.

Ident.: DSC-22_20-30-10-15-G-00009261.0001001 / 15 FEB 11
Applicable to: ALL

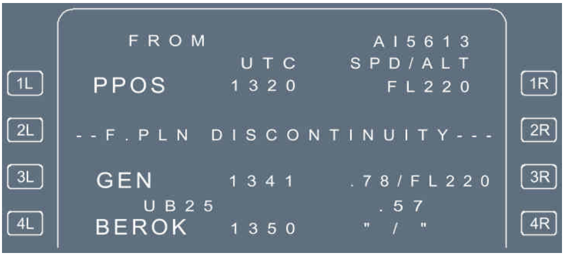
PARTICULAR CASES FOR USE OF DIR TO

- If the pilot is flying a manual leg (part of a SID or STAR), the flight plan page displays “F-PLN DISCONTINUITY”, preceded by “MANUAL” (See below).
  These legs are specific heading or track legs flown with no defined end waypoint.



```
        FROM                     AI5625
                      UTC        SPD/ALT
1L     AAA            1436         FL320     1R
2L       MANUAL                              2R
3L   --F.PLN   DISCONTINUITY---              3R
4L     CCC          1459    ----/----        4R
```

- When the pilot encounters a flight plan discontinuity, or if a major reset occurs, the flight plan page displays “PPOS - F-PLAN DISCONTINUITY”, and the pilot looses managed guidance in both the lateral and vertical plans.
  The autopilot or flight director reverts to the basic HDG V/S (or TRK FPA) modes. Predictions remain available and are based on the assumption that the aircraft will fly a direct leg from its present position to the next waypoint.



```
          FROM                   AI5613
                      UTC        SPD/ALT
1L     PPOS           1320         FL220     1R
2L   --F.PLN   DISCONTINUITY---              2R
3L     GEN            1341      .78/FL220    3R
            UB25                  .57
4L     BEROK          1350       "  /  "     4R
```

- **In both of these cases, the only way to get back to a standard flight plan is to perform a “DIR TO” a designated waypoint.**

Note: *During cruise, the DIR TO function is not available as long as uplink wind data, received through ACARS ◁ or ATSU ◁ , is not inserted or cancelled on the CRUISE WIND page.*

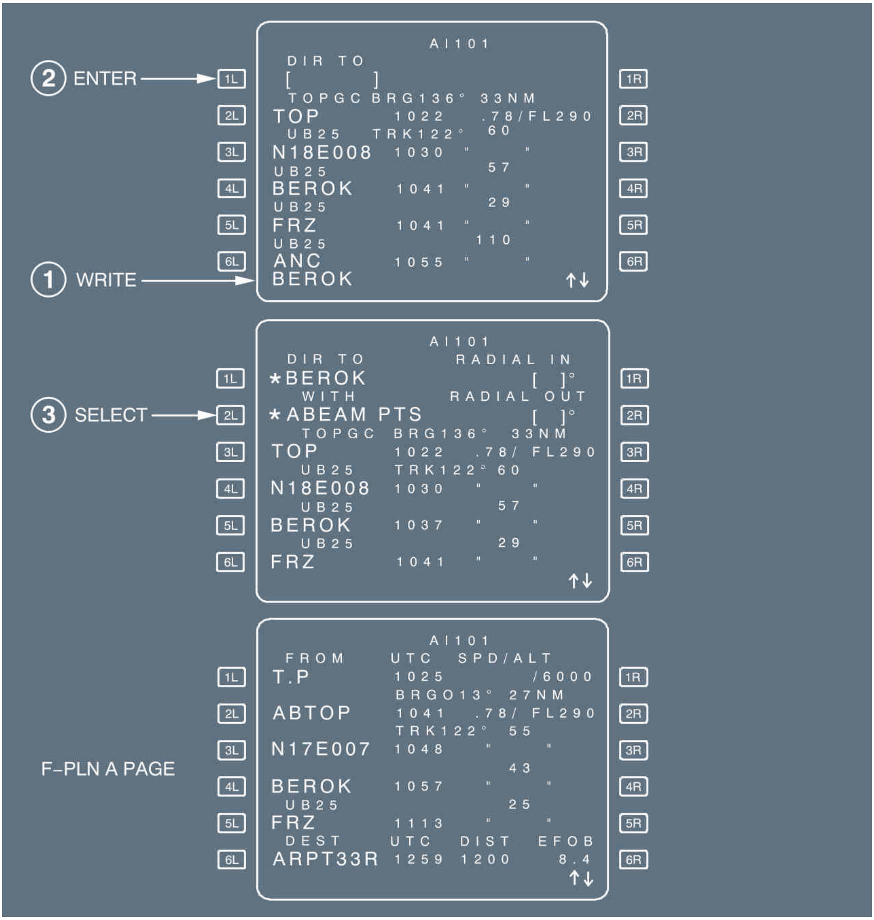
Ident.: DSC-22_20-30-10-15-G-00009262.0001001 / 11 MAR 13
Applicable to: LV-GKO, LV-GKP

PROCEDURE FOR DIR TO/ABEAM

Example : DIR TO/ABEAM to BEROK

PRESS the DIR key on the MCDU.
WRITE the waypoint identifier in the scratchpad (Here : BEROK).
PRESS [1 L] to enter the waypoint in the DIR TO field.
SELECT the ABEAM PTS function

The display reverts to F-PLN A page.



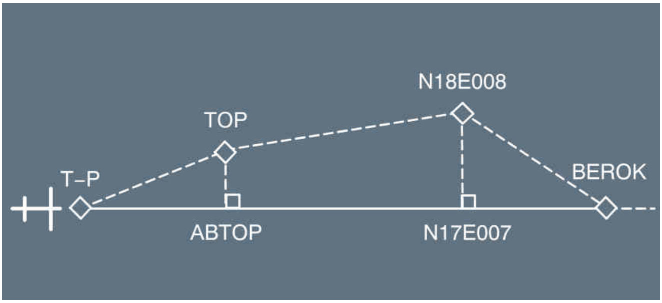
```
              AI101
 DIR TO
[        ]
 TOPGC BRG136°  33NM
TOP        1022   .78/FL290
 UB25    TRK122°   60
N18E008    1030  "     "
 UB25              57
BEROK      1041  "     "
 UB25              29
FRZ        1041  "     "
 UB25             110
ANC        1055  "     "
BEROK                    ↑↓
```

```
              AI101
 DIR TO          RADIAL IN
*BEROK              [  ]°
  WITH           RADIAL OUT
*ABEAM PTS          [  ]°
  TOPGC  BRG136°   33NM
TOP      1022   .78/ FL290
  UB25   TRK122° 60
N18E008  1030    "     "
  UB25             57
BEROK    1037    "     "
  UB25             29
FRZ      1041    "     "
                         ↑↓
```

```
              AI101
 FROM     UTC  SPD/ALT
T.P       1025      /6000
          BRG013°  27NM
ABTOP     1041  .78/ FL290
          TRK122°  55
N17E007   1048   "     "
                   43
BEROK     1057   "     "
 UB25              25
FRZ       1113   "     "
 DEST     UTC   DIST   EFOB
ARPT33R   1259  1200    8.4
                         ↑↓
```

Note: 1. *If between the two waypoints projected on the direct leg, there was a discontinuity in the original flight plan, this discontinuity disappears between the corresponding abeam points on the direct leg.*

2. If the pilot enters a latitude/longitude type reference waypoint, the system renames the abeam point with its recomputed coordinates (only in degrees).



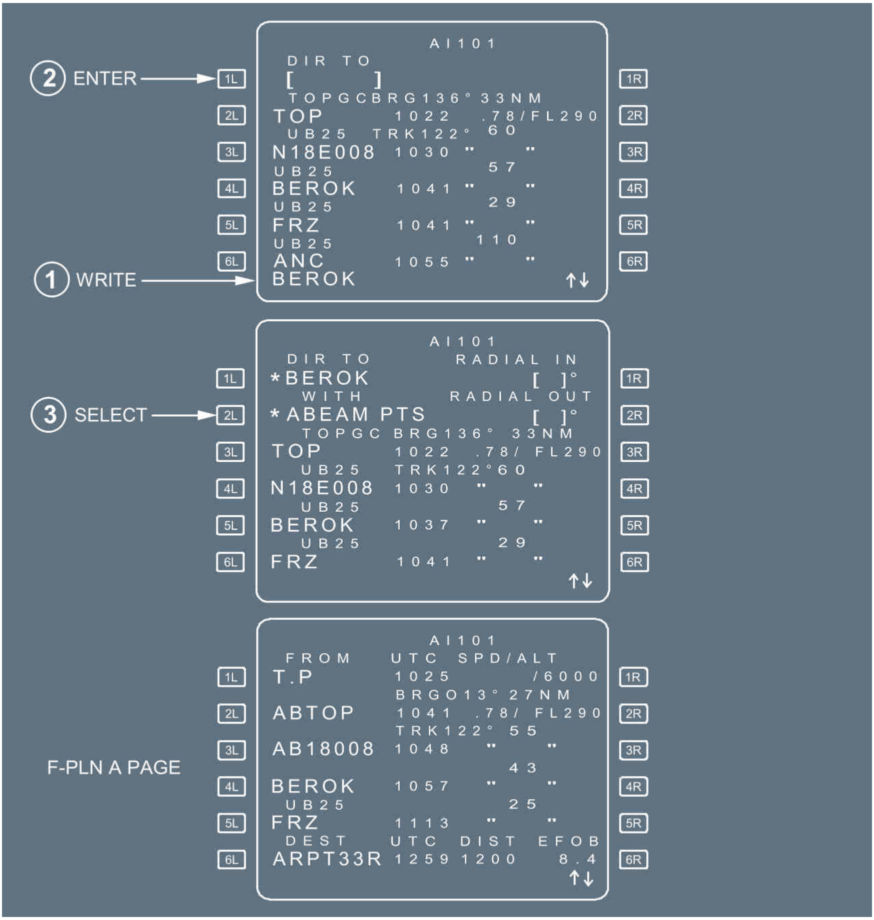
Ident.: DSC-22_20-30-10-15-G-00009262.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

PROCEDURE FOR DIR TO/ABEAM

Example: DIR TO/ABEAM to BEROK

PRESS the DIR key on the MCDU.
WRITE the waypoint identifier in the scratchpad (Here: BEROK).
PRESS [1 L] to enter the waypoint identifier in the DIR TO field.
SELECT the ABEAM PTS function.

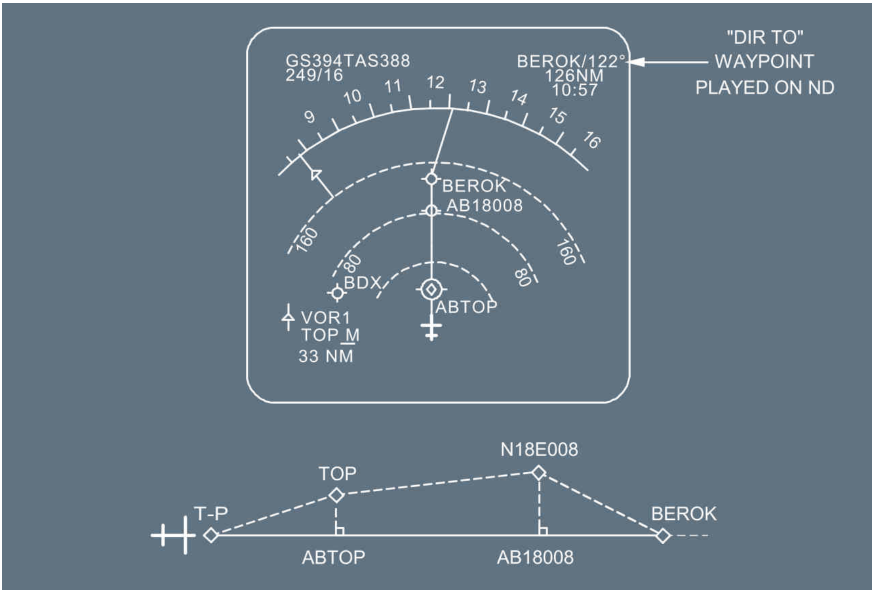
INSERT the DIR TO temporary F-PLN by pressing the DIR TO INSERT key [6R].



```
           AI101
 DIR TO
 [      ]
  TOPGCBRG136° 33NM
TOP       1022   .78/FL290
  UB25   TRK122°  60
N18E008   1030 "      "
  UB25            57
BEROK     1041 "      "
  UB25            29
FRZ       1041 "      "
  UB25           110
ANC       1055 "      "
BEROK                   ↑↓
```

```
           AI101
 DIR TO        RADIAL IN
*BEROK             [  ]°
   WITH        RADIAL OUT
*ABEAM PTS         [  ]°
   TOPGC BRG136° 33NM
TOP       1022  .78/ FL290
    UB25  TRK122°60
N18E008   1030  "    "
    UB25          57
BEROK     1037  "    "
    UB25          29
FRZ       1041  "    "
                        ↑↓
```

```
           AI101
 FROM     UTC  SPD/ALT
T.P       1025     /6000
          BRG013° 27NM
ABTOP     1041  .78/ FL290
          TRK122° 55
AB18008   1048   "    "
                  43
BEROK     1057   "    "
 UB25             25
FRZ       1113   "    "
 DEST     UTC  DIST  EFOB
ARPT33R   1259 1200   8.4
                        ↑↓
```


"DIR TO"
WAYPOINT
PLAYED ON ND
GS394TAS388
249/16
BEROK/122°
126NM
10:57
9
10
11
12
13
14
15
16
BEROK
AB18008
160
160
80
80
BDX
ABTOP
VOR1
TOP_M
33 NM
N18E008
TOP
T-P
BEROK
ABTOP
AB18008

Note: 1. *If between the two waypoints projected on the direct leg, there was a discontinuity in the original flight plan, this discontinuity disappears between the corresponding abeam points on the direct leg.*

2. *Abeam waypoints computed from latitude/longitude-type waypoints are renamed by the system as "AB XXXXX", where "xxxxx" is an abbreviation, in 5 characters, of the latitude and longitude of the initial waypoints.*

Ident.: DSC-22_20-30-10-15-G-00009263.0001001 / 14 MAY 12
Applicable to: ALL

PROCEDURE FOR DIR TO/INTERCEPT

PRESS the DIR key.
WRITE the waypoint identifier in the scratchpad.
PRESS [1L] to enter the waypoint in the DIR TO field.

In the [1R] and [2R] field, the MCDU displays the functions radial inbound and radial outbound from the waypoint.
If the waypoint belongs to the flight plan, the system displays the track of the flight plan as defaulted radial inbound. The crew can modify it.

WRITE the required in or out radial in the scratchpad.
PRESS [1R] or [2R] key to enter the radial in the required field.

The ND displays the entered radial in amber dotted line : the pilot can still modify it.

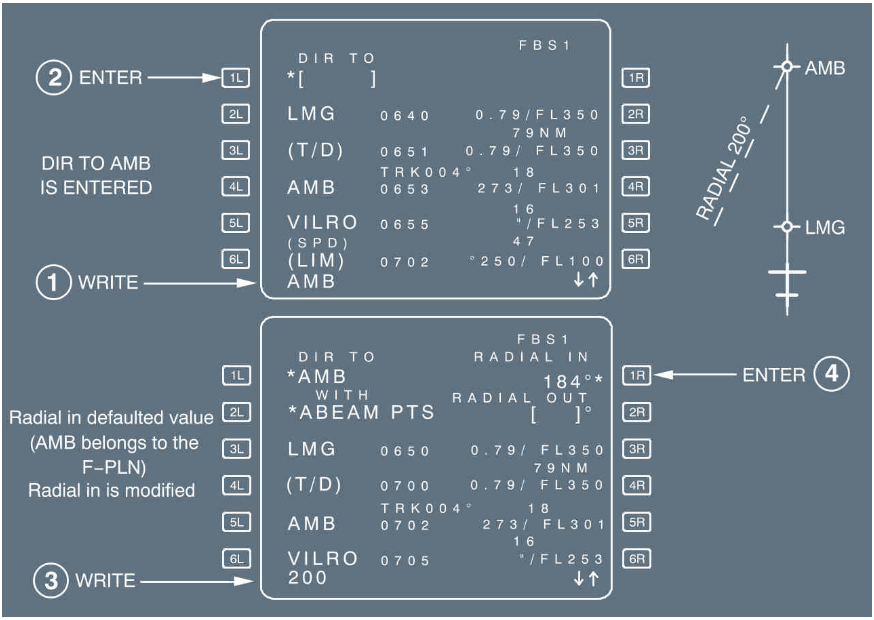
PRESS [1R] or [2R] key to confirm the DIR TO/INTERCEPT selection.

The display reverts to F-PLN A page, the system arms the NAV mode, and engages HDG mode. The FROM waypoint is the aircraft position at the time of the DIR TO/INTERCEPT selection. The MCDU indicates it as INBND or OUTBND.

Note: 1. *If the waypoint does not belong to the flight plan, the system strings the DIR TO/INTERCEPT leg to this waypoint, and inserts a discontinuity following the waypoint.*
2. *A DIR TO/INTERCEPT cancels any active offset.*
3. *If the current AP/FD lateral mode is HDG or TRK, NAV becomes armed.*
If the NAV mode was engaged, NAV becomes armed. FCU HDG or TRK must be used to guide the aircraft.
The ND displays an intercept point, if the intercept angle is less than 120 °. The system constantly updates it to reflect the current aircraft track and position with respect to the intercept radial. The NAV mode engages when reaching the intercept point.

EXAMPLE : RADIAL INBND

DIR TO AMB - RADIAL 200 ° INBOUND


FBS1
DIR TO
*[ ]
LMG 0640 0.79/FL350
79NM
(T/D) 0651 0.79/ FL350
TRK004° 18
AMB 0653 273/ FL301
16
VILRO 0655 "/FL253
(SPD) 47
(LIM) 0702 °250/ FL100
AMB ↓↑
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
AMB
RADIAL 200°
LMG
FBS1
DIR TO RADIAL IN
AMB 184°
WITH RADIAL OUT
*ABEAM PTS [ ]°
LMG 0650 0.79/ FL350
79NM
(T/D) 0700 0.79/ FL350
TRK004° 18
AMB 0702 273/ FL301
16
VILRO 0705 "/FL253
200 ↓↑

② ENTER

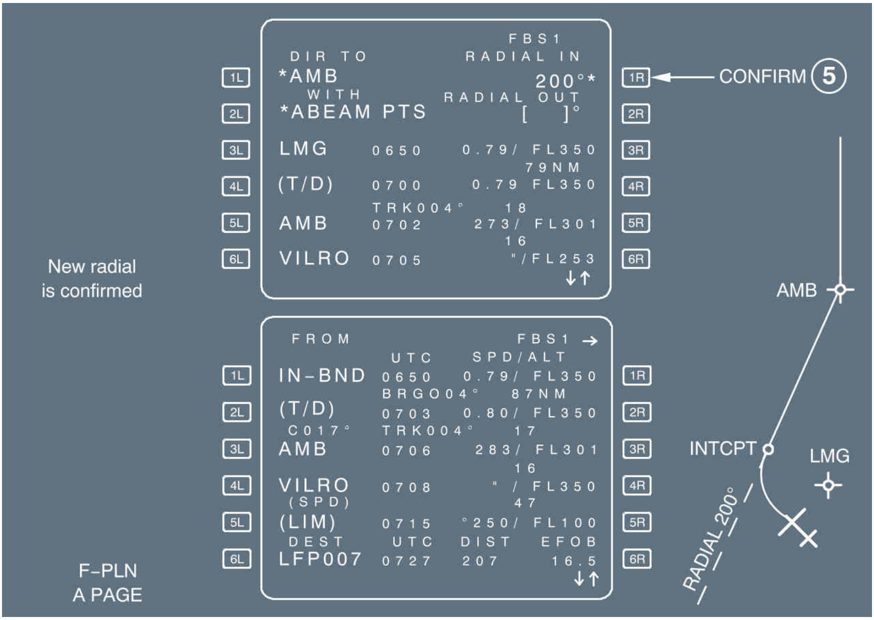
DIR TO AMB
IS ENTERED

① WRITE

④ ENTER

Radial in defaulted value
(AMB belongs to the
F–PLN)
Radial in is modified

③ WRITE



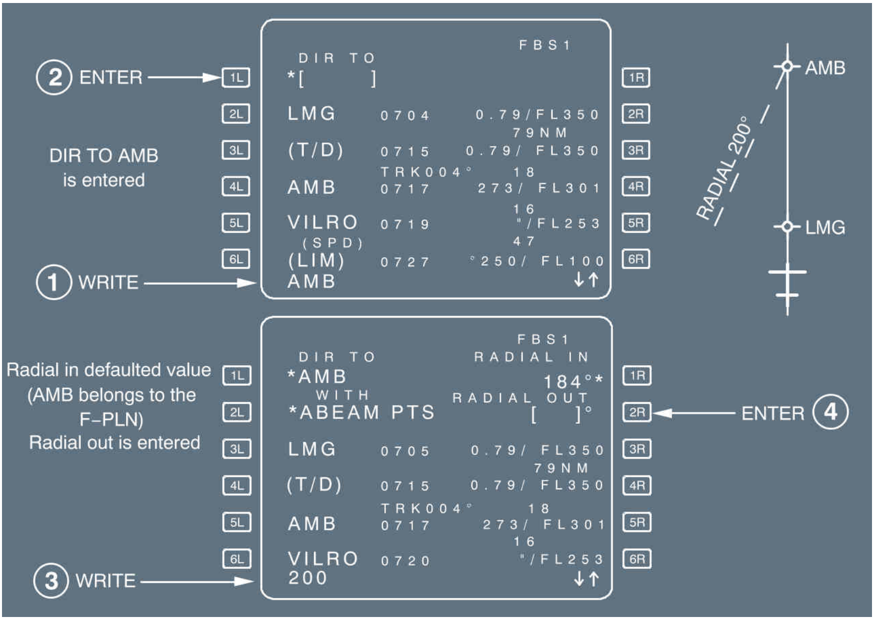
```
 DIR TO                   FBS1
                     RADIAL IN
*AMB                     200°*
   WITH             RADIAL OUT
*ABEAM PTS               [   ]°
LMG        0650      0.79/ FL350
                          79NM
(T/D)      0700       0.79 FL350
           TRK004°     18
AMB        0702       273/ FL301
                       16
VILRO      0705          "/FL253
                              ↓↑
```

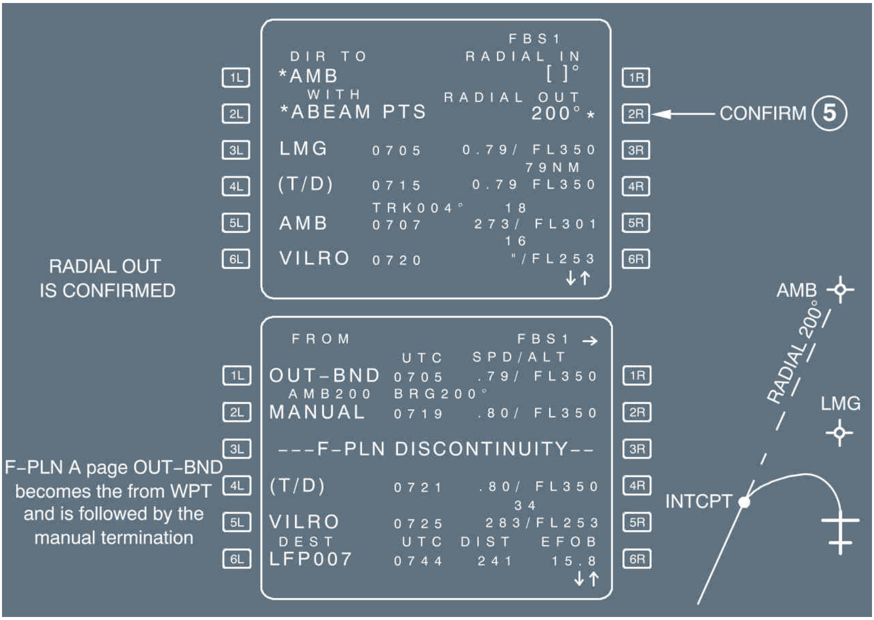
```
 FROM                      FBS1 →
           UTC       SPD/ALT
IN-BND     0650      0.79/ FL350
           BRG004°     87NM
(T/D)      0703      0.80/ FL350
 C017°     TRK004°     17
AMB        0706       283/ FL301
                        16
VILRO      0708        " / FL350
 (SPD)                  47
(LIM)      0715      °250/ FL100
 DEST       UTC    DIST    EFOB
LFP007     0727    207     16.5
                              ↓↑
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CONFIRM ⑤
New radial
is confirmed
F-PLN
A PAGE
AMB
INTCPT
LMG
RADIAL 200°

EXAMPLE : RADIAL OUTBND

DIR TO AMB - RADIAL 200 ° OUTBOUND


② ENTER
DIR TO AMB is entered
① WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FBS1
DIR TO
*[ ]
LMG 0704 0.79/FL350
79NM
(T/D) 0715 0.79/ FL350
TRK004° 18
AMB 0717 273/ FL301
16
VILRO 0719 "/FL253
(SPD) 47
(LIM) 0727 °250/ FL100
AMB ↓↑
AMB
RADIAL 200°
LMG
Radial in defaulted value (AMB belongs to the F–PLN)
Radial out is entered
③ WRITE
ENTER ④
FBS1
DIR TO
RADIAL IN
AMB 184°
WITH
RADIAL OUT
*ABEAM PTS [ ]°
LMG 0705 0.79/ FL350
79NM
(T/D) 0715 0.79/ FL350
TRK004° 18
AMB 0717 273/ FL301
16
VILRO 0720 "/FL253
200 ↓↑



```
                         FBS1
 DIR TO              RADIAL IN
*AMB                      [ ]°
   WITH             RADIAL OUT
*ABEAM PTS               200°*
LMG     0705      0.79/ FL350
                       79NM
(T/D)   0715      0.79  FL350
        TRK004°      18
AMB     0707      273/  FL301
                     16
VILRO   0720          "/FL253
                           ↓↑
```

CONFIRM ⑤

RADIAL OUT
IS CONFIRMED

```
 FROM                   FBS1 →
          UTC     SPD/ALT
OUT-BND   0705     .79/ FL350
  AMB200  BRG200°
MANUAL    0719     .80/ FL350
---F-PLN DISCONTINUITY--
(T/D)     0721     .80/ FL350
                      34
VILRO     0725     283/FL253
 DEST     UTC   DIST    EFOB
LFP007    0744   241    15.8
                          ↓↑
```

F-PLN A page OUT-BND
becomes the from WPT
and is followed by the
manual termination

OVFY (OVERFLY) KEY

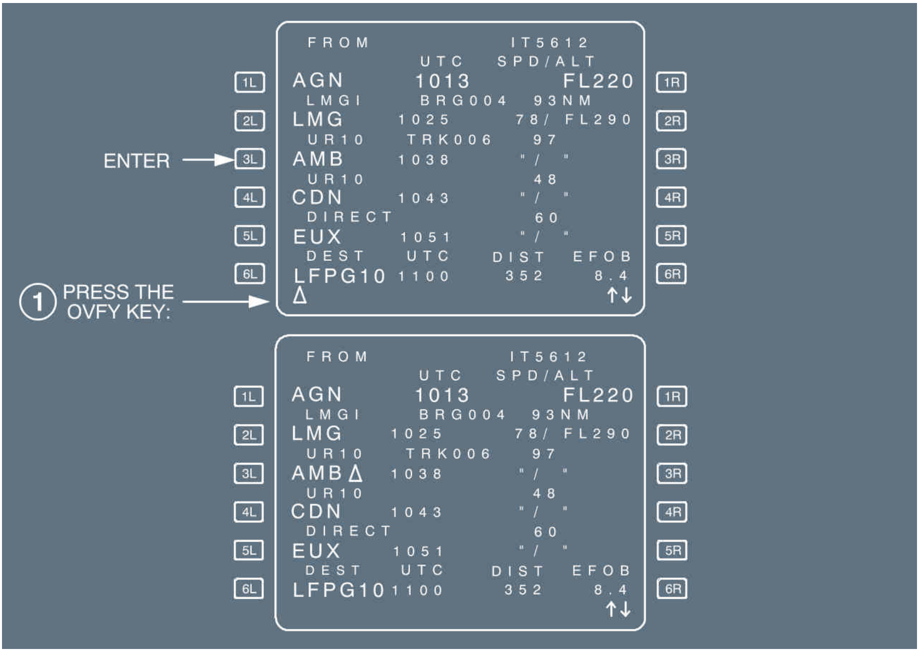
Ident.: DSC-22_20-30-10-15-00009264.0001001 / 14 MAY 12
Applicable to: ALL

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or navaid. To use it :

PRESS the “OVFY” key.

A “△” appears in the scratchpad.

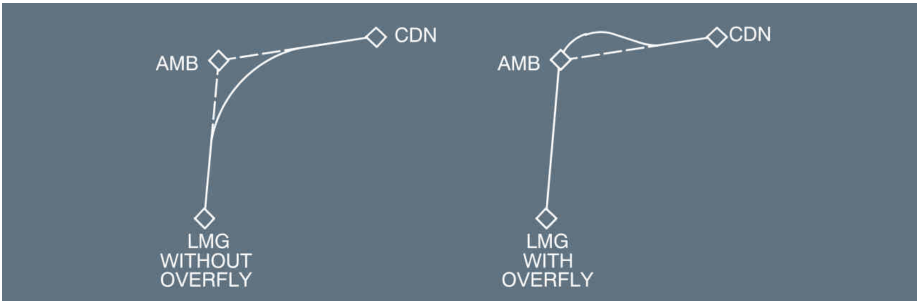
INSERT it, by pressing the key adjacent to the waypoint to be overflown. [3L] in this example.


ENTER
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
① PRESS THE OVFY KEY:

```
 FROM               IT5612
             UTC   SPD/ALT
AGN          1013      FL220
 LMGI       BRG004   93NM
LMG        1025      78/ FL290
 UR10       TRK006    97
AMB        1038       "/  "
 UR10                 48
CDN        1043       "/  "
 DIRECT               60
EUX        1051       "/  "
 DEST       UTC    DIST   EFOB
LFPG10     1100    352     8.4
Δ                           ↑↓
```

```
 FROM               IT5612
             UTC   SPD/ALT
AGN          1013      FL220
 LMGI       BRG004   93NM
LMG        1025      78/ FL290
 UR10       TRK006    97
AMBΔ       1038       "/  "
 UR10                 48
CDN        1043       "/  "
 DIRECT               60
EUX        1051       "/  "
 DEST       UTC    DIST   EFOB
LFPG10     1100    352     8.4
                            ↑↓
```

The pilot cannot cancel the overfly program. If you do not want to fly over the point you have entered, use DIR TO (direct to) the next waypoint or engage the heading mode, whichever is more suitable.

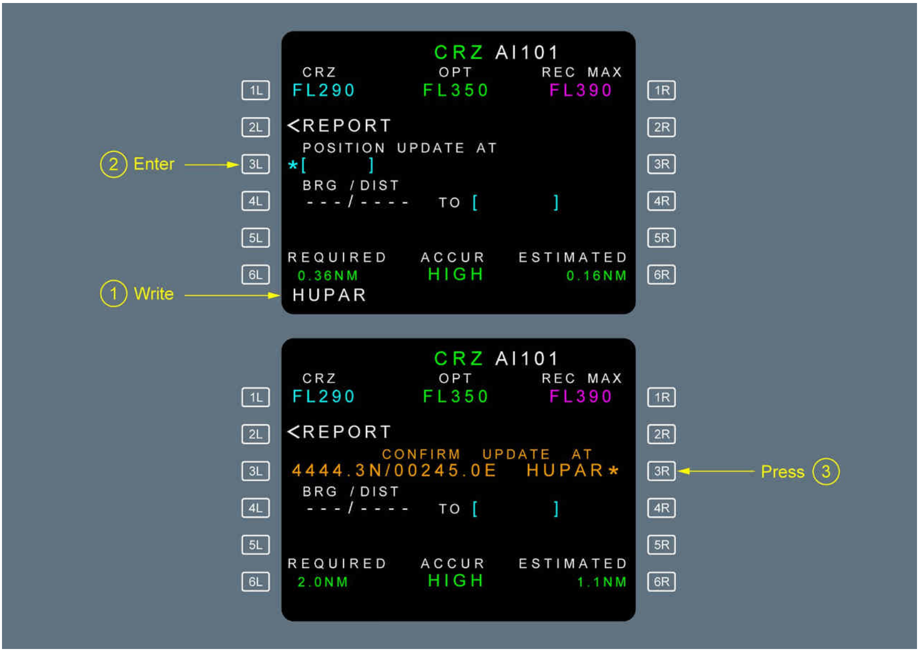

AMB
CDN
LMG
WITHOUT
OVERFLY
AMB
CDN
LMG
WITH
OVERFLY

The overfly function allows you to fly over a specific waypoint, and returns the aircraft to the great circle track.

POSITION UPDATE AT

Ident.: DSC-22_20-30-10-15-00009265.0003001 / 05 MAR 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

To manually change the position computed by the FMGEC (FM position and bias), the pilot uses “POSITION UPDATE AT” on the progress page.
Use this facility with extreme caution: It is apt to be inaccurate, because it relies on the pilot’s estimation of when a designated position has been reached.


CRZ AI101
CRZ OPT REC MAX
FL290 FL350 FL390
<REPORT
POSITION UPDATE AT
*[ ]
BRG / DIST
---/---- TO [ ]
REQUIRED ACCUR ESTIMATED
0.36NM HIGH 0.16NM
HUPAR
② Enter
① Write
CRZ AI101
CRZ OPT REC MAX
FL290 FL350 FL390
<REPORT
CONFIRM UPDATE AT
4444.3N/00245.0E HUPAR*
BRG / DIST
---/---- TO [ ]
REQUIRED ACCUR ESTIMATED
2.0NM HIGH 1.1NM
Press ③
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

WRITE the identifier for the navaid (or waypoint, or airport), or the coordinates, or the PBD or PB/PB at which an update is intended.
Press [3L] to ENTER the ident in the “POSITION UPDATE AT” field. The coordinates of the point, along with its identifier (or “ENTRY” if the identifier is not in the database), appear in that field.
PRESS [3R] to activate the update when you estimate that you are at the position.

Note: *The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a “NAV ACCUR DOWNGRAD” or “NAV ACCUR UPGRAD” message.*

If the “POSITION UPDATE AT” does not take effect properly, it corrupts the FM position.

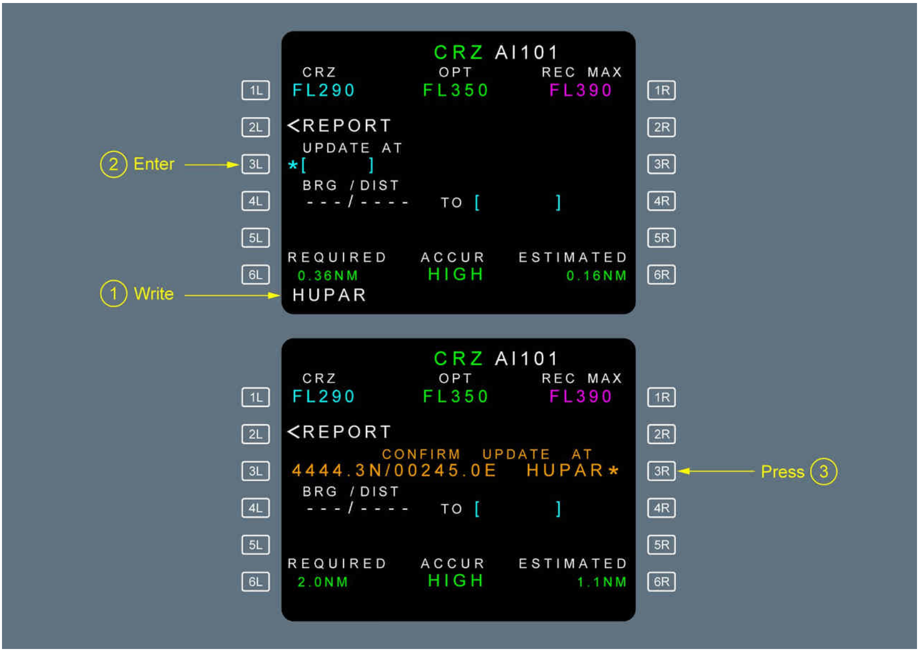
- In an area with good radio navaid coverage :
  - If the update error is small, subsequent radio position updating will correct the FM position.
  - If the update error is large, the system will reject any radio updating because its internal “reasonableness test” will reject the various navaids. Thus the FM position will only be the MIX IRS position corrected by the position bias determined at the time of the update, and the error will be maintained.
- In an area without proper navaid coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should use “POSITION UPDATE AT” only in case of a major position problem such as:
  - on the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected.
  - A “CHECK A/C POSITION” message appears and the position monitor page indicates an obvious position mismatch.
  - A “CHECK IRS/FM POSITION” message appears on the MCDU.
  - A “FM/IR POSITION DISAGREE” message appears on the ECAM.

When the GPS PRIMARY ◁ is operative, the "POSITION UPDATE AT" is inhibited.

UPDATE AT

Ident.: DSC-22_20-30-10-15-00009265.0001001 / 05 MAR 19
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

To manually change the position computed by the FMGEC (FM position and bias), the pilot uses “UPDATE AT” on the progress page.
Use this facility with extreme caution: It is apt to be inaccurate, because it relies on the pilot’s estimation of when a designated position has been reached.



```
        CRZ AI101
 CRZ        OPT       REC MAX
FL290      FL350       FL390
<REPORT
 UPDATE AT
*[      ]
 BRG / DIST
 ---/----      TO [        ]

REQUIRED     ACCUR     ESTIMATED
 0.36NM      HIGH        0.16NM
HUPAR
```

```
        CRZ AI101
 CRZ        OPT       REC MAX
FL290      FL350       FL390
<REPORT
          CONFIRM  UPDATE  AT
4444.3N/00245.0E      HUPAR*
 BRG / DIST
 ---/----      TO [        ]

REQUIRED     ACCUR     ESTIMATED
 2.0NM       HIGH        1.1NM
```

WRITE the identifier for the navaid (or waypoint, or airport), or the coordinates, or the PBD or PB/PB at which an update is intended.
Press [3L] to ENTER the ident in the "UPDATE AT" field. The coordinates of the point, along with its identifier (or "ENTRY" if the identifier is not in the database), appear in that field.
PRESS [3R] to activate the update when you estimate that you are at the position.

Note: *The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a "NAV ACCUR DOWNGRAD" or "NAV ACCUR UPGRAD" message.*

If the "UPDATE AT" does not take effect properly, it corrupts the FM position.

- In an area with good radio navaid coverage :
  - If the update error is small, subsequent radio position updating will correct the FM position.
  - If the update error is large, the system will reject any radio updating because its internal “reasonableness test” will reject the various navaids. Thus the FM position will only be the MIX IRS position corrected by the position bias determined at the time of the update, and the error will be maintained.
- In an area without proper navaid coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should use “UPDATE AT” only in case of a major position problem such as:
  - on the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected.
  - A “CHECK A/C POSITION” message appears and the position monitor page indicates an obvious position mismatch.
  - A “CHECK IRS/FM POSITION” message appears on the MCDU.
  - A “FM/IR POSITION DISAGREE” message appears on the ECAM.

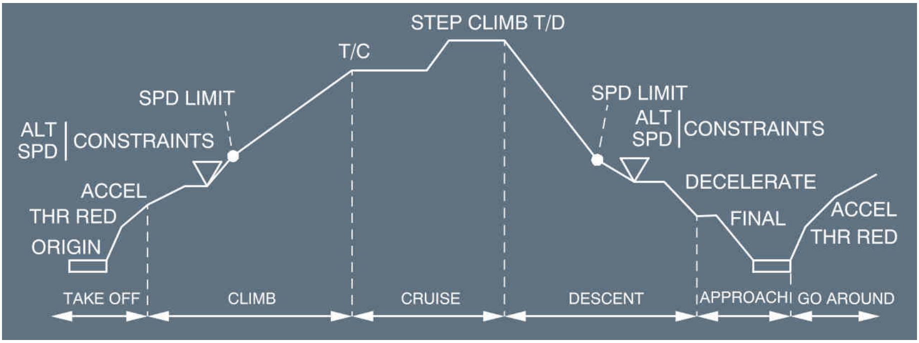
When the GPS PRIMARY ◁ is operative, the FM position will always converge towards the GPS position at a rate depending on the aircraft altitude. Therefore when GPS PRIMARY is operative, an “update at” that is inaccurate will have a temporary effect on the FM position.

General

GENERAL

Ident.: DSC-22_20-30-20-05-00011409.0001001 / 14 MAY 12
Applicable to: ALL

The vertical flight plan is divided into the following flight phases:
Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.
All but “Preflight” and “Done” phases are associated with speed and altitude profiles.



Each phase has an assigned profile of target speeds. For each phase the FMGES computes an optimum (ECON) speed as a function of the strategic parameters (CI, CRZ FL, ZFW, ZFWCG, block FUEL, winds and temperature) and performance criteria.
ECON speed is the basis of the managed speed profile.

The ECON speed can be modified by:
- Presetting a speed or Mach number on the MCDU (PERF page) for the next phase
- Selecting on the FCU a speed or a Mach number for the active phase
- Inserting speed constraints or speed limits on the MCDU vertical revision (VERT REV) page.

The vertical flight plan includes vertical constraints (altitude, speed, time) that may be stored in the data base or entered manually by the flight crew through vertical revision pages.
The flight crew may also define step climbs or step descents for cruise purposes. If the flight crew plans to climb to a higher flight level or descend to a lower level, they can use a vertical revision at any waypoint to insert the new level.
When all the vertical data has been defined, the FMGEC computes the vertical profile and the managed speed/Mach profile from takeoff to landing.

VERTICAL FLIGHT PLANNING

Ident.: DSC-22_20-30-20-05-00011410.0003001 / 17 MAR 11
Applicable to: ALL

DATA ENTRY

The vertical flight plan provides the FMGES with all the data required to calculate performance and predictions. This data is either entered by the flight crew or calculated by the FMS.

There are three categories of data:

- Strategic data, that applies to the overall flight profile:
  - Cost Index (CI)
  - Cruise Flight Level (CRZ FL) and STEP ALTS, if any
  - Zero-Fuel Weight (ZFW)
  - Zero-Fuel Weight Center of Gravity (ZFWCG)
  - Block Fuel.
- Weather data (data entered by the flight crew or measured data):
  - Winds (for climb, cruise, descent, approach)
  - Sea level atmospheric pressure (QNH) at destination
  - Surface temperature (TEMP) at destination
  - Temperature in cruise phase
  - The Tropopause altitude (TROPO).
- Tactical data for the flight phases:
  - Phase switching conditions:
    - Setting of the thrust levers to TOGA or FLEX positions
    - Reaching acceleration altitude (ACCEL ALT)
    - Entering cruise (T/C)
    - Initiation of descent (T/D)
    - Passing a deceleration pseudo waypoint (DECEL PSEUDO WPT)
    - Touchdown.
  - Speed profile:
    - V2
    - Economy climb speed or Mach (ECON CLB SPD/MACH)
    - Preselected speed or Mach (SPD/MACH PRESELECTION)
    - Economy cruise Mach (ECON CRZ MACH)
    - Constant Mach
    - Economy descent Mach or speed (ECON DES MACH/SPD)
    - Approach speed (VAPP).
  - Vertical limitations:
    - Speed limits (SPD LIMIT)
    - Speed and altitude constraints (SPD AND ALT CSTR)
    - Time constraint or Required Time of Arrival (RTA).

In addition to data entered by the flight crew, the FMS uses some real flight data parameters (CRZ SAT, actual wind) to improve the accuracy of the computed predictions.

FLIGHT PHASES

Ident.: DSC-22_20-30-20-05-00016084.0006001 / 25 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The vertical flight plan is divided into flight phases. For each phase, the FMGES computes the optimum speed or Mach Profile. These flight phases are:
Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
PREFLIGHT	-	SRS takeoff mode engaged and N1 is more than 85 % (EPR is more than or equal to 1.25) or Ground Speed is more than 90 kt
TAKEOFF	V2 (V2+10 kt)	At acceleration altitude or by engagement of another vertical mode
CLIMB	ECON CLB SPD / MACH	Reaching cruise flight level
CRUISE	ECON CRZ MACH	No step descent, and distance to destination is less than 200 NM, or all engines are operative and selected altitude below Max [FL 200, highest DES ALT CSTR]
DESCENT	ECON DES MACH / SPD	- Overflying (DECEL) pseudo waypoint with NAV (or LOC*/LOC or F-LOC* ◁ /F-LOC ◁) mode engaged, or - Manual activation of the approach phase.
APPROACH	VAPP (GS Min)	1. To Go-Around: when thrust levers at TOGA detent, or 2. To Done: 30 s after landing, or 3. To Climb: when inserting a new CRZ FL
GO-AROUND	VAPP or current SPD whichever is higher. Green Dot at acceleration altitude.	1. To Approach: Manual activation of the approach phase, or 2. To Climb: Above acceleration altitude by - Selecting ALTN, or - Inserting NEW DEST.
DONE	-	To preflight: when INIT or PERF key is pressed

Note: *During the preflight phase, the flight crew inserts the flight plan which includes all data needed for the flight.*
During the Done phase, the FMGES erases the data entered for the flight. If the Descent or the Approach phase is inadvertently activated (e.g. manual approach phase activation), the flight crew may reselect a CRZ FL on the PROG page to reactivate the Cruise phase.

FLIGHT PHASES

Ident.: DSC-22_20-30-20-05-00016084.0001001 / 27 FEB 18
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

The vertical flight plan is divided into flight phases. For each phase, the FMGES computes the optimum speed or Mach Profile. These flight phases are:
Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
PREFLIGHT	/	SRS takeoff mode engaged and N1 > 85 % (EPR ≥ 1.25) or Ground Speed > 90 kt
TAKEOFF	V2 (V2+10)	At acceleration altitude or by engagement of another vertical mode.
CLIMB	ECON CLB SPD / MACH	Reaching cruise FL
CRUISE	ECON CRZ MACH	No step descent, and distance to destination < 200 NM, or all engine operative and selected altitude below Max [FL 200, highest DES ALT CSTR]
DESCENT	ECON DES MACH / SPD	- Overflying (DECEL) pseudowaypoint with NAV (or LOC*/LOC or F-LOC*/F-LOC ◁*) mode engaged and altitude < 7 200 ft AGL (9 500 ft AGL for FMS R1A and subsequent). - Manual activation of the approach phase.
APPROACH	VAPP (GS Min)	1. To Go-Around: when thrust levers at TOGA detent, or 2. To Done: 30 s after landing, or 3. To Climb: when inserting a new CRZ FL
GO-AROUND	VAPP or current SPD whichever is greater. Green Dot at ACC ALT	1. To Approach: Manual activation of the approach phase, or 2. To Climb: Above acceleration altitude by - Selecting ALTN, or - Inserting NEW DEST
DONE	/	To preflight: when INIT or PERF key depressed.

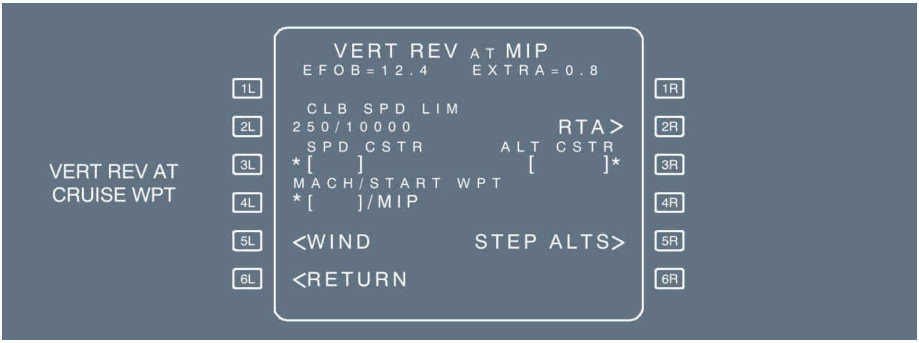
Note: *During the preflight phase, the flight crew inserts the flight plan, which includes all data needed for the flight.*
During the done phase, the FMGEC erases the data entered for the flight. If the descent or the approach phase is inadvertently activated (manual approach phase activation, for example), the flight crew may reselect a CRZ FL on the PROG page to reactivate the CRZ phase.

VERTICAL REVISION

Ident.: DSC-22_20-30-20-05-00011412.0003001 / 01 OCT 12
Applicable to: ALL

The flight crew uses vertical revisions to enter or modify:
- The speed limit in the climb and descent phases
- An altitude or speed constraint at the revised waypoint
- A step climb or a step descent
- New wind data
- A time constraint.

The vertical revision page is accessed by pressing a right hand select key of the flight plan page.


VERT REV AT CRUISE WPT

```
     VERT REV AT MIP
   EFOB=12.4      EXTRA=0.8

    CLB SPD LIM
250/10000                    RTA>
    SPD CSTR            ALT CSTR
*[     ]               [       ]*
MACH/START WPT
*[     ]/MIP
<WIND                  STEP ALTS>
<RETURN
```

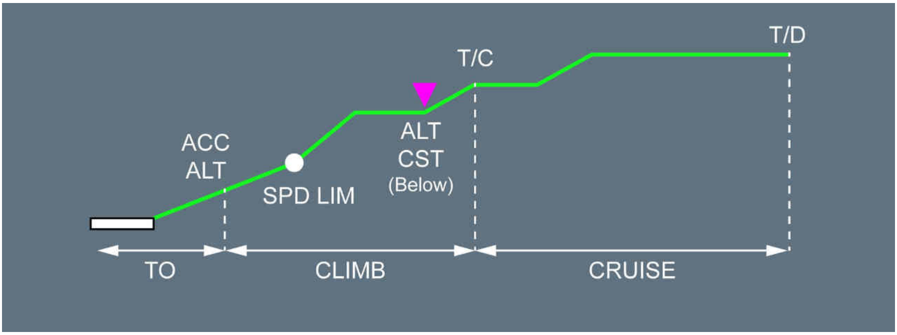
VERTICAL CONSTRAINTS (SPEED, ALTITUDE, TIME)

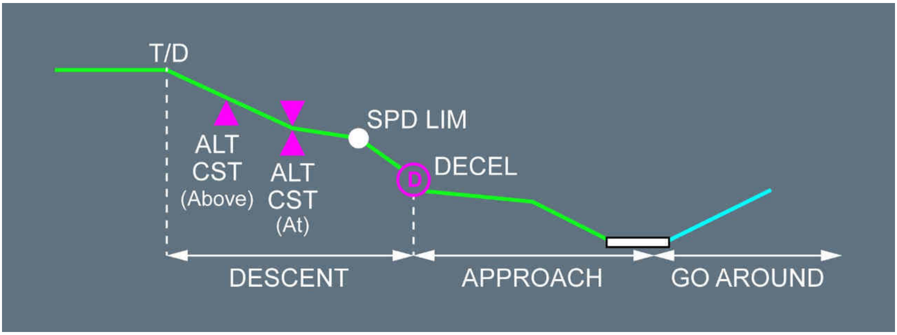
Ident.: DSC-22_20-30-20-05-A-00011413.0005001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The flight crew enters speed, altitude and time constraints, either to comply with ATC requests and specified procedures, or at the discretion of the flight crew, in response to operational variables.

SPEED LIMIT

A speed limit is associated with altitude as a maximum speed below a specified altitude (only one in climb and one in descent).


T/D
T/C
ACC
ALT
SPD LIM
ALT
CST
(Below)
TO
CLIMB
CRUISE


T/D
ALT
CST
(Above)
ALT
CST
(At)
SPD LIM
D
DECEL
DESCENT
APPROACH
GO AROUND

ALTITUDE CONSTRAINT

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.
To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the flight crew or the database.

Note: *The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.*

An altitude constraint is considered as missed if the system predicts more than 250 ft of difference between the constraint value and the predicted aircraft altitude.
Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

The FMS automatically deletes from the F-PLN:
- The altitude constraints (AT, AT OR ABOVE or AT OR BELOW) with values greater than the CRZ FL
- The upper constraint of altitude constraint windows with the upper constraint greater than the CRZ FL.

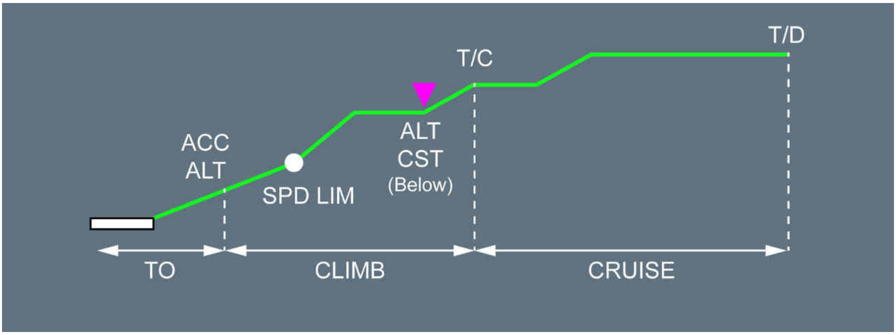
The MCDU and the ND no longer display the deleted altitude constraints. These altitude constraints are no longer used for the computation of the FMS climb and descent profile.
In that case, the scratchpad of the MCDU displays the CSTR DEL ABOVE CRZ FL message.
The FMS does not delete the altitude constraints at the CRZ FL. The FMS computes the T/D, in order to respect these altitude constraints. However these altitude constraints are not used for guidance. If the flight crew initiates the descent before reaching the T/D, the aircraft descents below the altitude constraints, and the altitude constraints are missed (amber on the MCDU and on the ND).

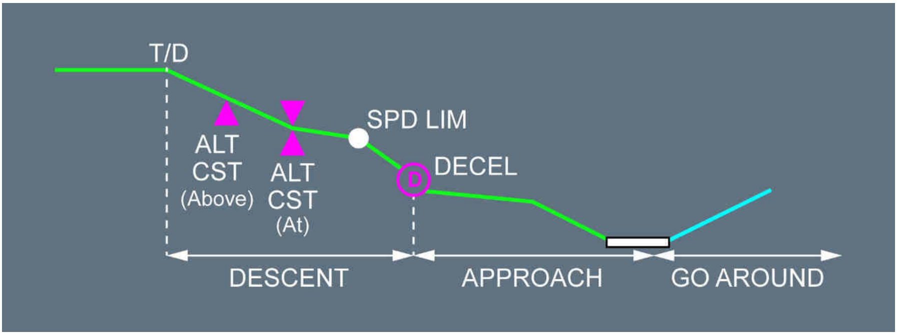
Ident.: DSC-22_20-30-20-05-A-00011413.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

The flight crew enters speed, altitude and time constraints, either to comply with ATC requests and specified procedures, or at the discretion of the flight crew, in response to operational variables.

SPEED LIMIT

A speed limit is associated with altitude as a maximum speed below a specified altitude (only one in climb and one in descent).





ALTITUDE CONSTRAINT

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.
To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the flight crew or the database.

Note: *The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.*

An altitude constraint is considered as missed if the system predicts more than 250 ft of difference between the constraint value and the predicted aircraft altitude.
Altitude constraints are observed in CLB, or DES, or APP NAV-FINAL modes.

The FMS automatically deletes from the F-PLN:
- The altitude constraints (AT, AT OR ABOVE, or AT OR BELOW) with values equal to the CRZ FL, or greater than the CRZ FL
- The altitude constraint windows with the upper constraint equal to the CRZ FL, or greater than the CRZ FL.

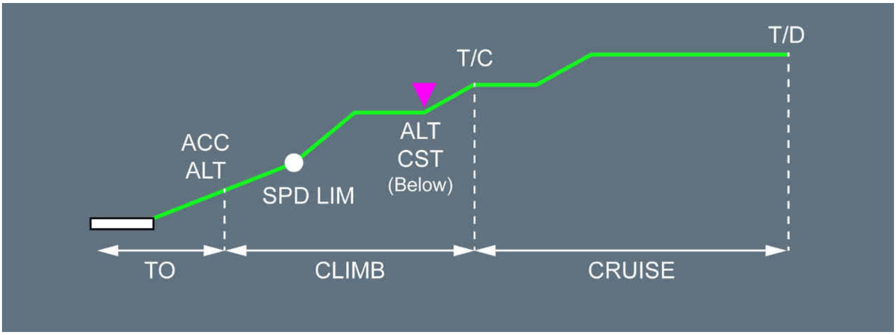
The MCDU and the ND no longer display the deleted altitude constraints. These altitude constraints are no longer used for the computation of the FMS climb and descent profile.
In that case, the scratchpad of the MCDU displays the CSTR DEL ABOVE CRZ FL message.

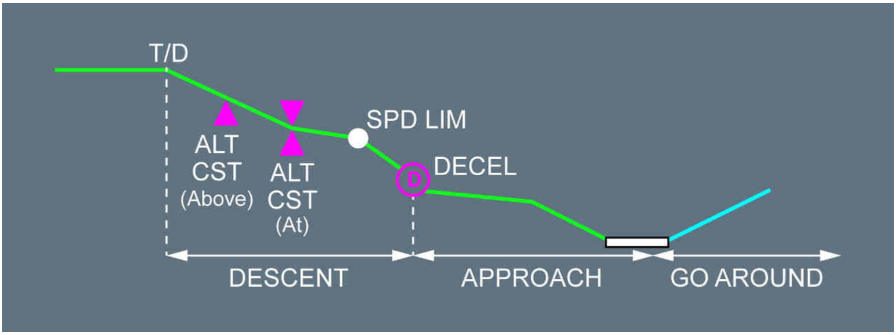
Ident.: DSC-22_20-30-20-05-A-00011413.0004001 / 03 NOV 23
Applicable to: LV-KHT, LV-KHU

The flight crew enters speed, altitude and time constraints, either to comply with ATC requests and specified procedures, or at the discretion of the flight crew, in response to operational variables.

SPEED LIMIT

A speed limit is associated with altitude as a maximum speed below a specified altitude (only one in climb and one in descent).





ALTITUDE CONSTRAINT

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.
To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the flight crew or the database.

Note: *The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.*

An altitude constraint is considered as missed if the system predicts more than 250 ft of difference between the constraint value and the predicted aircraft altitude.
Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

The FMS automatically deletes from the F-PLN:

- The altitude constraints (AT, AT OR ABOVE, or AT OR BELOW) with values greater than the CRZ FL
- The altitude constraint windows with the upper constraint greater than the CRZ FL.

The MCDU and the ND no longer display the deleted altitude constraints. These altitude constraints are no longer used for the computation of the FMS climb and descent profile.
In that case, the scratchpad of the MCDU displays the CSTR DEL ABOVE CRZ FL message.
The FMS does not delete the altitude constraints at the CRZ FL. The FMS computes the T/D, in order to respect these altitude constraints. However these altitude constraints are not used for guidance. If the flight crew initiates the descent before reaching the T/D, the aircraft descents below the altitude constraints, and the altitude constraints are missed (amber on the MCDU and on the ND).

Ident.: DSC-22_20-30-20-05-A-00026431.0001001 / 03 NOV 23
Applicable to: ALL

SPEED CONSTRAINT

Speed constraints are managed by the FMS when:

- The NAV mode is engaged, and
- The speed target is managed, and
- The speed constraint is equal or above the maneuvering speed.

In all other cases, the speed constraints are disregarded.

TIME CONSTRAINT

Time constraint may be attached to any waypoint except the FROM waypoint.

Note: *No constraint can be associated with go-around waypoints.*

Intentionally left blank

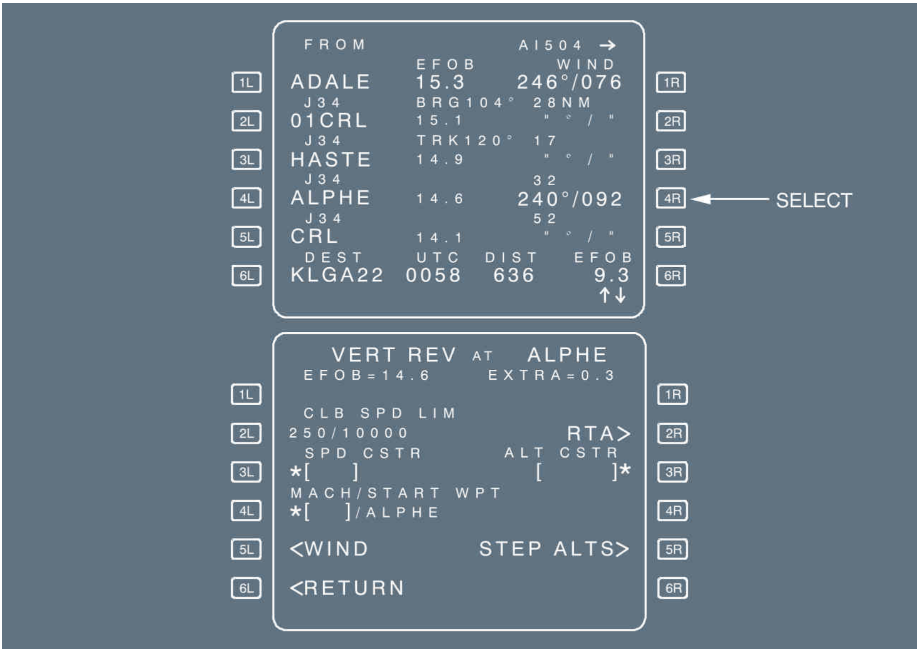
FMS2 Honeywell

GENERAL

Ident.: DSC-22_20-30-20-25-00008908.0001001 / 14 MAY 12
Applicable to: ALL

The vertical revision function allows the pilot to modify the following parts of the flight plan:
- The Speed limit
- Speed and altitude constraints
- Time constraints
- Wind
- Step climb or step descent
- Constant Mach segment

The crew calls up the VERT REV page by pressing the right key on F-PLN A or B page.



```
  FROM                         AI504 →
               EFOB            WIND
ADALE          15.3       246°/076
  J34          BRG104°    28NM
01CRL          15.1          "  °  /  "
  J34          TRK120°    17
HASTE          14.9          "  °  /  "
  J34                     32
ALPHE          14.6       240°/092
  J34                     52
CRL            14.1          "  °  /  "
  DEST       UTC      DIST      EFOB
KLGA22      0058      636        9.3
                                  ↑↓
```

```
     VERT REV AT    ALPHE
  EFOB=14.6      EXTRA=0.3

  CLB SPD LIM
250/10000                     RTA>
  SPD CSTR               ALT CSTR
*[    ]                  [       ]*
MACH/START WPT
*[    ]/ALPHE
<WIND                   STEP ALTS>
<RETURN
```

Note: This vertical functions section only describes the following three functions: Wind and time constraints, and Constant Mach Segment.
For other vertical revision functions, refer to PRO_NOR_SRP_01 FMS.

TIME CONSTRAINT/RTA

Applicable to: ALL

Ident.: DSC-22_20-30-20-25-A-00008899.0001001 / 15 FEB 11

GENERAL

A Required Time of Arrival (RTA) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints. When the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a star (*):

- **if the RTA is predicted as matched,**

  the star (*) is magenta
- **if the RTA is predicted as missed**

  the star (*) is amber.

No specific symbol is provided on the ND.
A time constraint is cleared in the same way as any other constraints. If a time constraint is automatically deleted, the MCDU displays an “RTA DELETED” message.

Ident.: DSC-22_20-30-20-25-A-00008900.0001001 / 22 MAR 16

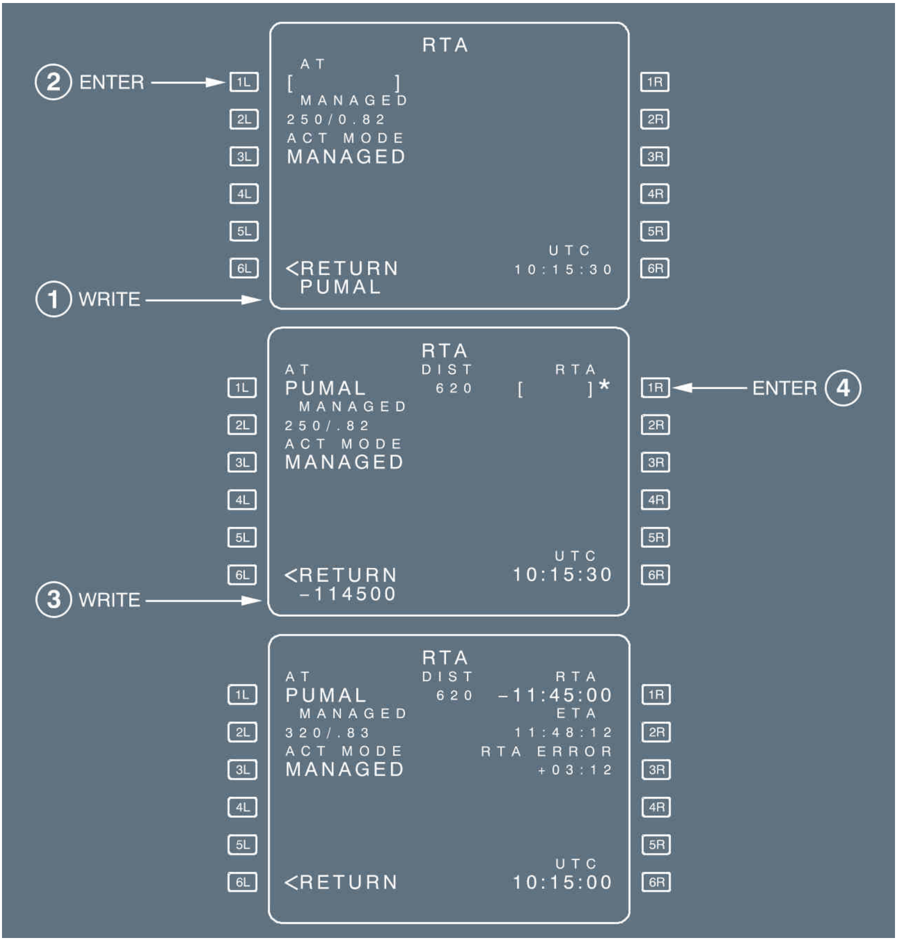
ENTERING A REQUIRED TIME OF ARRIVAL

SELECT the F-PLN key on MCDU
SELECT a VERT REV at revised WPT
SELECT the RTA prompt (2R key)

The MCDU displays the RTA page.

WRITE the identifier of the waypoint where the time constraint has to be defined
ENTER it in 1L field

The prompt RTA and the distance indication appear.



```
                 RTA
 AT
[          ]
 MANAGED
250/0.82
ACT MODE
MANAGED



                            UTC
<RETURN                10:15:30
 PUMAL
```

```
                 RTA
AT              DIST        RTA
PUMAL            620   [        ]*
 MANAGED
250/.82
ACT MODE
MANAGED



                            UTC
<RETURN                10:15:30
 -114500
```

```
                 RTA
AT              DIST        RTA
PUMAL            620   -11:45:00
 MANAGED                    ETA
320/.83                 11:48:12
ACT MODE               RTA ERROR
MANAGED                 +03:12



                            UTC
<RETURN                10:15:00
```

WRITE the required time of arrival

The format is +/- HHMMSS (entry of seconds is not mandatory)

ENTER it in 1R field

CHECK on fields 2R and 3R if the entered constraint can be met.

WIND - TEMPERATURE - QNH

Ident.: DSC-22_20-30-20-25-B-00008910.0001001 / 15 FEB 11
Applicable to: ALL

GENERAL

In order to receive the best predictions, the pilot must enter wind and temperature values for the different phases and for various waypoints of the cruise phase.
The system uses the temperature value at a given altitude, associated with the tropopause as entered on the INIT A page to optimize the temperature profile.

Ident.: DSC-22_20-30-20-25-B-00008913.0003001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

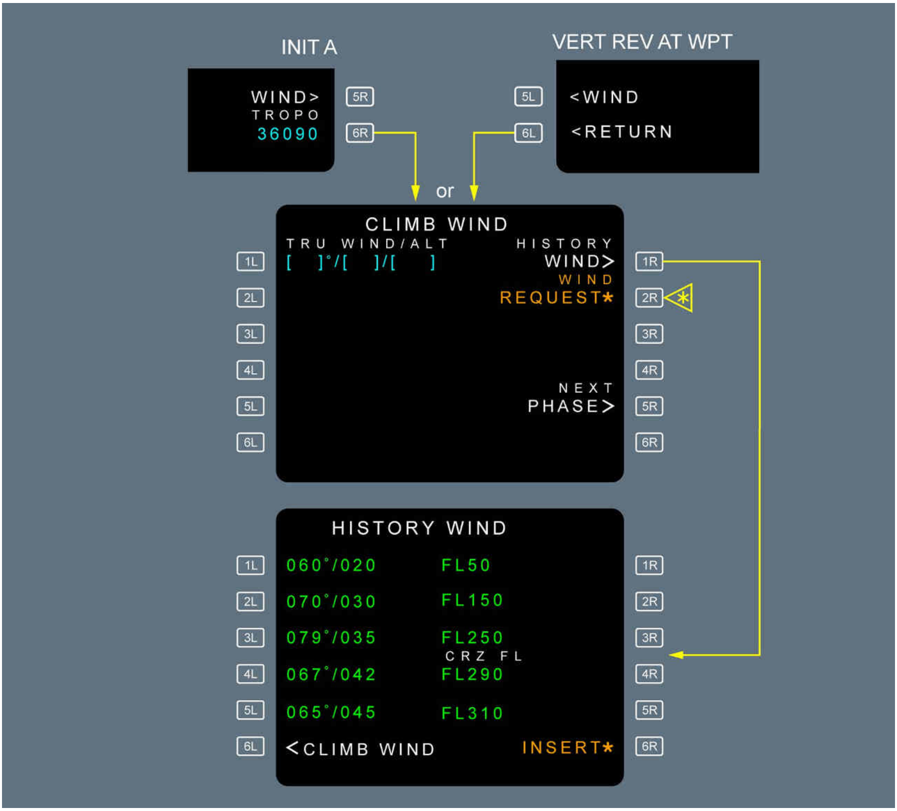
ENTERING THE TRIP WIND AND TEMPERATURE DURING THE F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The flight crew can enter it before engine start on the INIT FUEL PRED page. It is usually defined by the airlines flight operations on the computerized flight plan.
The FMGES does not consider the trip wind for alternate predictions.
The trip wind is used as long as no winds are entered in the CLIMB WIND, CRUISE WIND and DESCENT WIND pages.
When the flight crew enters a CLB, CRZ or DES wind, the FMGES disregards the trip wind.

PRESS the INIT key.
INSERT the temperature at cruise FL.
On the INIT FUEL PRED page INSERT the TRIP WIND.
The trip wind is defined as a headwind component (HDXX, XXHD or - XX), or as a tailwind (TLXX, XXTL or + XX).
The FMGES uses the trip wind to compute preliminary performance, time and fuel predictions.
CHECK the predictions on the F-PLN B page.
For the ALTN F-PLN, an average wind may be entered on the DESCENT WIND page for alternate cruise flight level.

Note: *Wind can be automatically received (and inserted) through ACARS system* ◁ .

When a CLB, CRZ or DES wind is entered, the system ignores the TRIP WIND. When temperature and winds are inserted, the FMGES computes the ISA profile, and the F-PLN B page displays the forecast wind profile (by linear interpolation and propagation).


INIT A
WIND>
TROPO
36090
5R
6R
VERT REV AT WPT
5L
6L
<WIND
<RETURN
or
CLIMB WIND
TRU WIND/ALT
[ ]°/[ ]/[ ]
HISTORY
WIND>
WIND
REQUEST*
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
HISTORY WIND
060°/020 FL50
070°/030 FL150
079°/035 FL250
CRZ FL
067°/042 FL290
065°/045 FL310
<CLIMB WIND
INSERT*

Ident.: DSC-22_20-30-20-25-B-00008913.0001001 / 01 MAR 18
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

ENTERING THE TRIP WIND AND TEMPERATURE DURING THE F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The pilot can enter it before engine start on the INIT B page. It is usually defined by the airlines flight operations on the computerized flight plan.
The FMGES does not consider the trip wind for alternate predictions.
The trip wind is used as long as no winds are entered in the CLB, CRZ and DES WIND pages.
When the pilot enters a CLB, CRZ or DES WIND, the FMGES disregards the trip wind.

PRESS the INIT key
INSERT the temperature at cruise FL

On the INIT B page INSERT the TRIP WIND

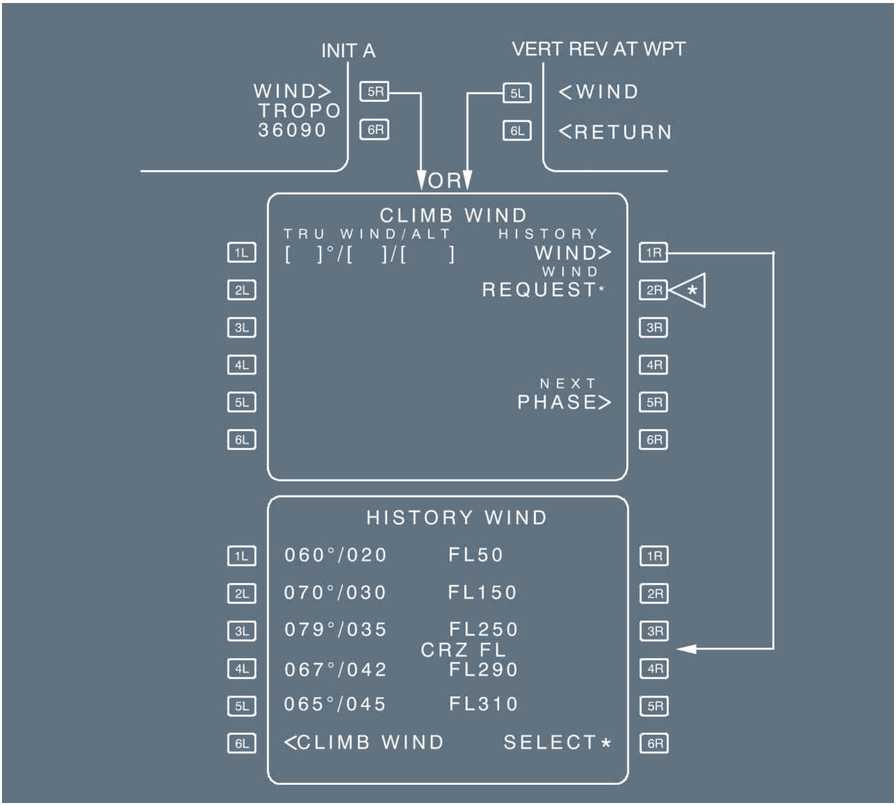
The trip wind is defined as a headwind component (HDXX, XXHD or - XX), or as a tailwind (TLXX, XXTL or + XX).
The FMGES uses the trip wind to compute preliminary performance, time and fuel predictions.

CHECK the predictions on the F-PLN B page

For the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note: *Wind can be automatically received (and inserted) through ACARS system ◁* .*

Once a CLIMB, CRZ or DESCENT WIND is entered, the system ignores the TRIP WIND. Once temperature and winds are inserted, the FMGES computes the ISA profile, and the F-PLN B page displays the forecast wind profile (by linear interpolation and propagation).


INIT A
WIND>
TROPO
36090
5R
6R
VERT REV AT WPT
5L
<WIND
6L
<RETURN
OR
CLIMB WIND
TRU WIND/ALT
[ ]°/[ ]/[ ]
HISTORY
WIND>
WIND
REQUEST*
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
*
HISTORY WIND
060°/020 FL50
070°/030 FL150
079°/035 FL250
CRZ FL
067°/042 FL290
065°/045 FL310
<CLIMB WIND
SELECT*

Ident.: DSC-22_20-30-20-25-B-00008914.0001001 / 01 MAR 18
Applicable to: ALL

ENTERING THE WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

When completing the INIT A page and once the wind and cruise FL temperature forecasts are available, the pilot may enter them, if significantly different, by pressing the wind prompt.
He will access the different wind pages using NEXT PHASE key and PREV PHASE key. He will slew the CRZ WIND page to access the various waypoints of the cruise winds.

The pilot will enter wind data as follows:
- For climb phase; by inserting either the HISTORY WIND data (as recorded during the last descent) or by inserting winds (at up to 5 altitudes) on the CLIMB WIND page.
- for cruise phase; by inserting winds (at up to 4 FL) at various CRZ waypoints on the CRZ WIND pages. The 4 levels are the same for all the cruise waypoints. The pilot may enter the temperature of each waypoint and at destination on this page.
- For descent phase; by inserting winds (at up to 5 FL/altitudes) on the DES WIND page.
- For the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note: *Wind can be automatically received (and inserted) through ACARS system ◁ .*

Once a CLIMB, CRZ or DESCENT WIND is entered, the system ignores the TRIP WIND.
Once temperature and winds are inserted, the FMGES computes the ISA profile, and the F-PLN B page displays the forescast wind profile (by linear interpolation and propagation).

WIND ENTRY RULES

When from an empty field, a wind entry is performed, direction/velocity/altitude (or flight level) must be entered simultaneously. One entry in each bracket.
Overwriting a wind cancels the previous one.
Entered wind data can be cleared, the field reverts to brackets. Propagated wind cannot be cleared.
Entering a new altitude over an existing altitude replaces that existing altitude at all cruise waypoints. Any winds entered at the overwritten altitude are lost at all cruise waypoints.

ENTERING THE HISTORY WIND (F-PLN INITIALIZATION)

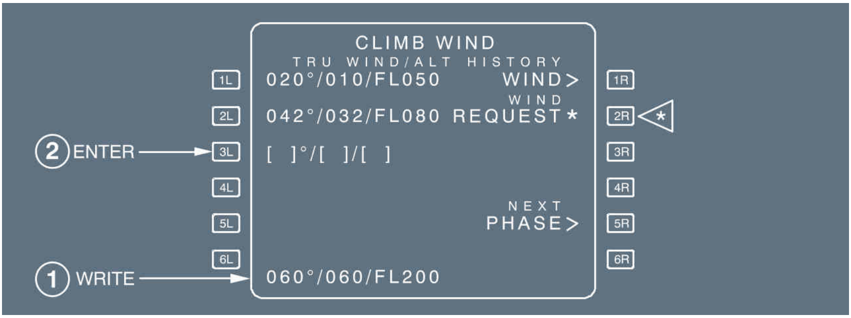
The pilot may insert the history wind but cannot modify this page.
If convenient, PRESS the (6R) prompt to insert. After insertion, the [6R] prompt is suppressed but the page still displays the wind values for information.

ENTERING THE CLIMB WIND (F-PLN INITIALIZATION)

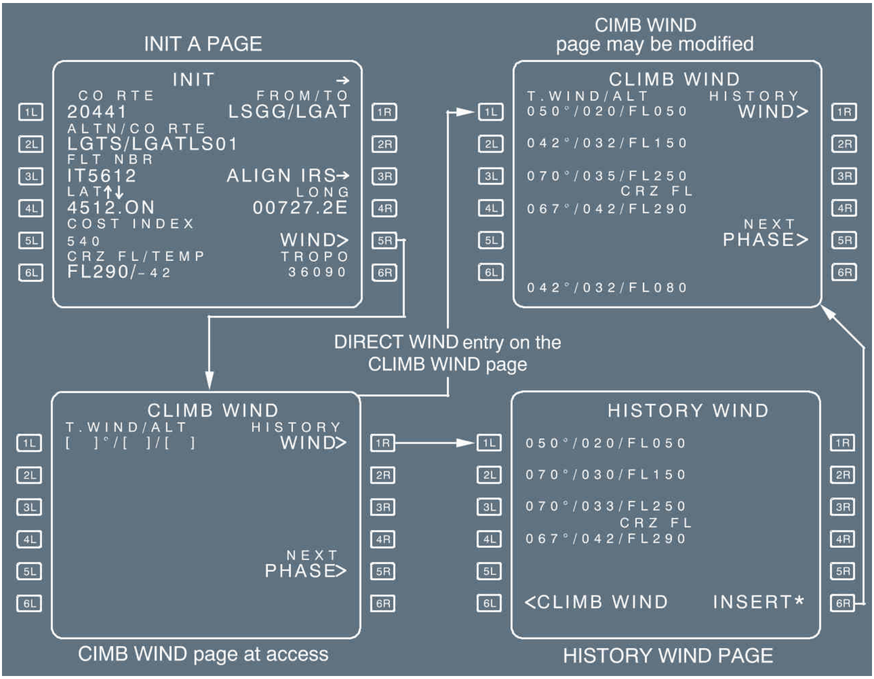
If history winds are not convenient.

SELECT CLIMB WIND page from INIT A page or VERT REV page.

WRITE new winds into the scratchpad and ENTER.


CLIMB WIND
TRU WIND/ALT
020°/010/FL050
HISTORY
WIND>
WIND
042°/032/FL080
REQUEST*
[ ]°/[ ]/[ ]
NEXT
PHASE>
060°/060/FL200
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
② ENTER
① WRITE

Winds entered on CLIMB, CRZ and DESCENT WIND pages are always true North referenced.
Tower wind entered on PERF is magnetic referenced.
The pilot can enter “GRND” in the altitude field for wind at destination.
CLIMB WIND cannot be modified when the climb phase is active.
At climb phase transition, wind data switches from blue to green colour and any attempted modification will trigger the “NOT ALLOWED” message.
The system extrapolates the highest wind entry to all higher levels.
The system interpolates winds between 2 entered levels.


INIT A PAGE
INIT →
CO RTE 20441
FROM/TO LSGG/LGAT
ALTN/CO RTE LGTS/LGATLS01
FLT NBR IT5612
ALIGN IRS→
LAT↑↓ 4512.0N
LONG 00727.2E
COST INDEX 540
WIND>
CRZ FL/TEMP FL290/-42
TROPO 36090
CIMB WIND page may be modified
CLIMB WIND
T.WIND/ALT 050°/020/FL050
HISTORY WIND>
042°/032/FL150
070°/035/FL250
CRZ FL
067°/042/FL290
NEXT PHASE>
042°/032/FL080
DIRECT WIND entry on the CLIMB WIND page
CLIMB WIND
T.WIND/ALT [ ]°/[ ]/[ ]
HISTORY WIND>
NEXT PHASE>
CIMB WIND page at access
HISTORY WIND
050°/020/FL050
070°/030/FL150
070°/033/FL250
CRZ FL
067°/042/FL290
<CLIMB WIND
INSERT*
HISTORY WIND PAGE
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

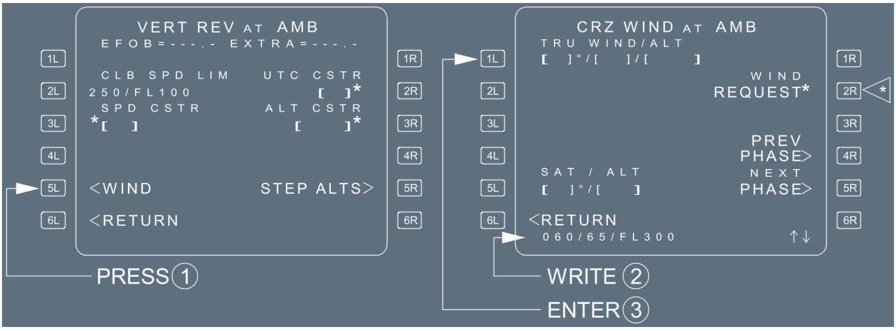
Ident.: DSC-22_20-30-20-25-B-00008921.0001001 / 01 MAR 18
Applicable to: ALL

ENTERING THE CRUISE WINDS AND TEMPERATURES

At flight plan initialization, the CRZ WIND page displays all cruise waypoints with empty brackets. In flight, only downpath waypoints are displayed.

SELECT VERT REV at WPT.
PRESS the WIND prompt.
SELECT NEXT PHASE.
SLEW until relevant waypoint is displayed.
WRITE and ENTER the new temperature into the scratchpad.
WRITE and ENTER the new wind data into the scratchpad.

WIND and temperature may be entered through ACARS pages. If ACARS is installed.


VERT REV AT AMB
EFOB=---.- EXTRA=---.-
CLB SPD LIM
250/FL100
UTC CSTR
[ ]*
SPD CSTR
*[ ]
ALT CSTR
[ ]*
<WIND
STEP ALTS>
<RETURN
CRZ WIND AT AMB
TRU WIND/ALT
[ ]°/[ ]/[ ]
WIND
REQUEST*
PREV
PHASE>
SAT / ALT
[ ]°/[ ]
NEXT
PHASE>
<RETURN
060/65/FL300
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
PRESS ①
WRITE ②
ENTER ③

The crew should modify the entered winds and temperatures in flight, if a significant difference is expected (greater than 30 kt or 30 ° for the wind data and greater than 5 °C for the temperature).
The FMS propagates the crew (or ACARS) wind and temperature entries downpath, until a waypoint for which a different temperature or wind has been entered (for the same flight level), or until the last cruise waypoint.
The forecast winds at a waypoint are determined as follows:

- **If the predicted altitude at the waypoint matches an altitude defined in the CRUISE WIND page,** the forecasted wind is the corresponding entered or propagated wind, displayed at that waypoint on the CRUISE WIND page.

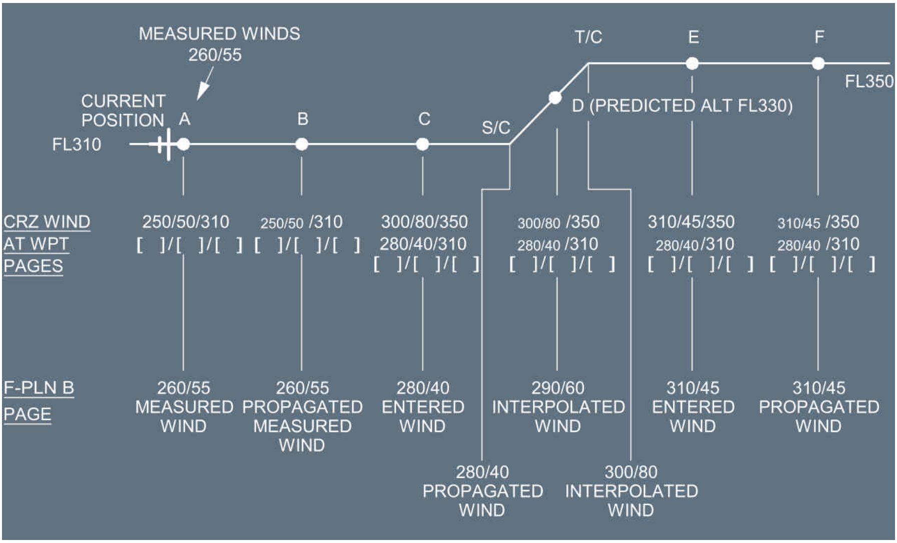
- **If the predicted altitude lies between two altitudes entered on the CRUISE WIND page,** the wind direction and velocity are linearly interpolated.

- **If the predicted altitude is above or below the set of CRUISE altitudes,** the forecasted wind is a constant value extrapolated from the entered or propagated wind at the highest (or lowest) altitude displayed on the CRUISE WIND page for that point.

Once in flight, the FMGES considers the real, measured wind up to 200 NM ahead of the aircraft, to permanently update the wind profile. This updated wind profile is used to compute the predictions and the performance data, but is not displayed to the crew.
The CRZ WIND pages display the propagated values in small blue font, and the crew (or ACARS) entries in large blue font.

Note: *The CRZ WIND page displays ACARS ◁* or crew entered data. It never displays computed or propagated data (F-PLN B page only).*

Example :


MEASURED WINDS
260/55
T/C
E
F
FL350
CURRENT POSITION
A
B
C
S/C
D (PREDICTED ALT FL330)
FL310
CRZ WIND AT WPT PAGES
250/50/310
[ ]/[ ]/[ ]
250/50 /310
[ ]/[ ]/[ ]
300/80/350
280/40/310
[ ]/[ ]/[ ]
300/80 /350
280/40 /310
[ ]/[ ]/[ ]
310/45/350
280/40/310
[ ]/[ ]/[ ]
310/45 /350
280/40 /310
[ ]/[ ]/[ ]
F-PLN B PAGE
260/55 MEASURED WIND
260/55 PROPAGATED MEASURED WIND
280/40 ENTERED WIND
290/60 INTERPOLATED WIND
310/45 ENTERED WIND
310/45 PROPAGATED WIND
280/40 PROPAGATED WIND
300/80 INTERPOLATED WIND

Ident.: DSC-22_20-30-20-25-B-00008925.0001001 / 15 FEB 11
Applicable to: ALL

EFFECT OF WIND ENTRIES ON OPTIMUM FLIGHT LEVEL

The computation of the OPT FL considers the wind entries made at the different altitudes (normally at the different CRZ FL).
When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL ; these winds are propagated automatically and may be significantly different from the actual winds.
We recommend the following procedure : if the propagated winds at the lower altitudes are significantly different from the actual winds, enter the wind at these altitudes or if not available, the wind measured at the current CRZ FL.

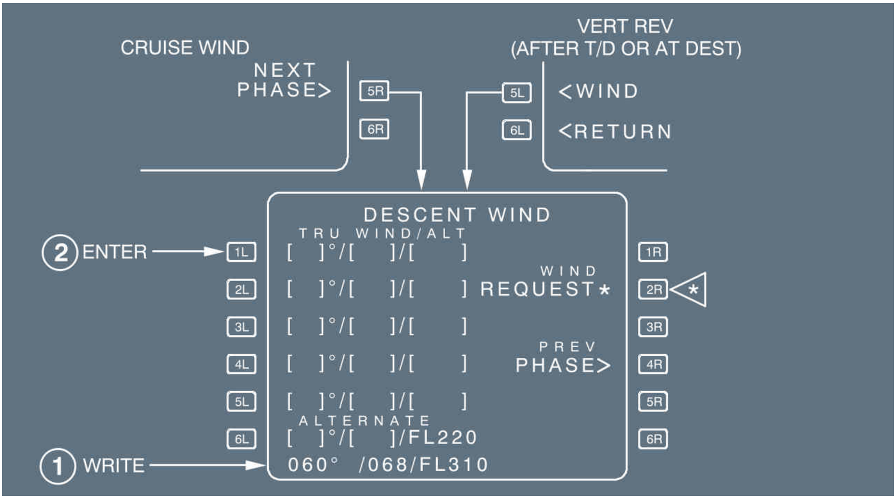
Ident.: DSC-22_20-30-20-25-B-00008928.0001001 / 01 OCT 12
Applicable to: ALL

ENTERING THE DESCENT WINDS

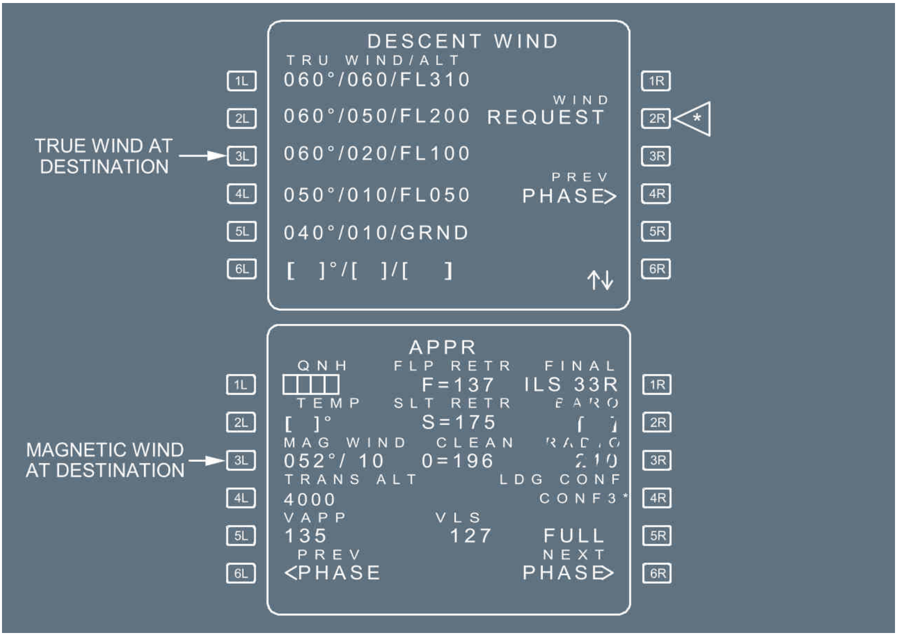
The flight crew will enter as many as one wind at 5 different FL or altitudes. This wind data will be used for descent profile and prediction computation.
From the vertical revision page, or from the CRZ WIND page:

PRESS the WIND prompt.
SELECT the DESCENT WIND page.

ENTER up to 5 different “wind/altitude”.


CRUISE WIND
NEXT PHASE>
5R
6R
VERT REV
(AFTER T/D OR AT DEST)
5L <WIND
6L <RETURN
DESCENT WIND
TRU WIND/ALT
[ ]°/[ ]/[ ]
[ ]°/[ ]/[ ]
[ ]°/[ ]/[ ]
[ ]°/[ ]/[ ]
[ ]°/[ ]/[ ]
ALTERNATE
[ ]°/[ ]/FL220
060° /068/FL310
WIND REQUEST*
PREV PHASE>
② ENTER
① WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

A wind is written as true direction/velocity/flight level or altitude in feet.
If the flight crew enters “GRND” in the altitude field, the system uses the associated wind as wind at destination.
The descent profile is corrected, as well as the tower wind entered in the PERF APPR page. (The wind direction is then modified of the magnetic variation, if the airfield is magnetic North referenced).


```
         DESCENT WIND
 TRU WIND/ALT
060°/060/FL310
                        WIND
060°/050/FL200   REQUEST*
060°/020/FL100
                         PREV
050°/010/FL050       PHASE>
040°/010/GRND
[  ]°/[  ]/[    ]           ↑↓
```
```
              APPR
  QNH      FLP RETR     FINAL
□□□□      F=137     ILS 33R
  TEMP     SLT RETR      BARO
[  ]°      S=175        [   ]
MAG WIND   CLEAN       RADIO
052°/ 10   0=196         210
TRANS ALT            LDG CONF
4000                    CONF3*
VAPP          VLS
135           127       FULL
  PREV                  NEXT
<PHASE                 PHASE>
```

When the winds have been entered, the F-PLN B page displays the forecast wind profile at all descent waypoints, using values it has interpolated from manual entries. Descent winds are not modifiable when the descent, approach or go-around phase is active. At descent phase transition, wind data switch from blue to green, and any attempted modification triggers the “NOT ALLOWED” message.

Ident.: DSC-22_20-30-20-25-B-00008930.0001001 / 15 FEB 11
Applicable to: ALL

ENTERING THE ALTERNATE WIND

Alternate wind is entered on the DESCENT WIND page. If an ALTN wind is not defined, the predictions are computed with a wind defaulted to zero. Alternate wind can be modified at any time. In addition, the alternate cruise (ALTN CRZ) level defaults to:

- FL 220, if the length of the alternate flight plan (ALTN F-PLN) is less than 200 NM.
- FL 310, if the length of the ALTN F-PLN is greater or equal to 200 NM.

The ALTN wind profile is as follows:

- ALTN CLB wind	:	Mean wind between ALTN CRZ wind, as entered on the DESCENT WIND page, and the wind at primary DEST, as entered on the PERF APPR page.
- ALTN CRZ wind	:	If no ALTN WIND has been entered on the DESCENT WIND page, the WIND at primary DEST (as entered on the PERF APPR page) is considered. In case of no entry by the flight crew, zero wind is assumed.
- ALTN DES wind	:	Mean wind between ALTN CRZ WIND and wind at FL 100. Wind at FL 100 = interpolation between wind at ALTN CRZ FL and zero at ALTN DEST.

Ident.: DSC-22_20-30-20-25-B-00008932.0001001 / 01 OCT 12
Applicable to: ALL

ENTERING THE APPROACH WIND TEMPERATURE AND QNH

The wind at destination is entered on the PERF APPR page, in the 3L field. If the airport is magnetic North-referenced, the PERF APPR page displays MAG WIND. If the airport is true North-referenced, the PERF APPR page displays TRUE WIND.
The wind entry is copied into the true wind reference on the DESCENT WIND page, at ground level (GRND), and the F-PLN B page, at destination. A ground entry, on the DESCENT WIND page, is in the same way, automatically copied to the F-PLN B page and the PERF APPR page (magnetic or true, depending on the airfield reference).
The wind is modifiable in the descent, approach, and go-around phases.

SELECT the PERF key on the MCDU
PRESS the NEXT PHASE key (6R)
WRITE QNH and temperature and enter them.
WRITE the surface wind (magnetic or true, depending on the airport reference) into the scratchpad and enter it.

Note: *At each wind entry, the descent profile is recomputed, therefore it is recommended to enter all winds, temperature and QNH at the same time to minimize recomputation time.*

CONSTANT MACH SEGMENT

Applicable to: ALL

Ident.: DSC-22_20-30-20-25-C-00008934.0001001 / 15 FEB 11

GENERAL

The pilot can enter the start and end points of a constant Mach segment, and its associated Mach number from the VERT REV page.

Only one Constant Mach segment may be defined in the active flight plan, and one in the secondary flight plan. No Constant Mach segment can be defined in the alternate flight plan.

Ident.: DSC-22_20-30-20-25-C-00008936.0001001 / 14 MAY 12

ENTERING A CONSTANT MACH SEGMENT

SELECT the F-PLN key on MCDU.
SELECT a VERT REV at revised waypoint

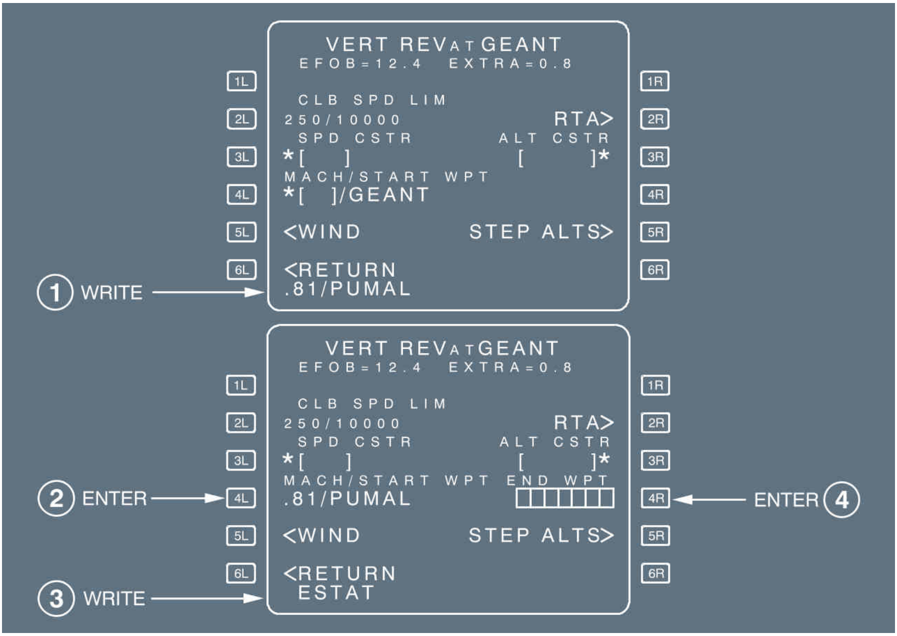
(except destination and alternate flight plan waypoint).

WRITE the Mach/start waypoint pair.

It is possible to enter only the Mach or the waypoint. But, for the first entry, a Mach entry is mandatory.
The waypoint must be located in front of the aircraft and must be part of the cruise.

ENTER it in 4L field

The END WPT prompt appears in the 4R field.



```
VERT REV AT GEANT
 EFOB=12.4   EXTRA=0.8

 CLB SPD LIM
250/10000               RTA>
 SPD CSTR           ALT CSTR
*[   ]              [      ]*
MACH/START WPT
*[   ]/GEANT

<WIND             STEP ALTS>

<RETURN
.81/PUMAL
```

```
VERT REV AT GEANT
 EFOB=12.4   EXTRA=0.8

 CLB SPD LIM
250/10000               RTA>
 SPD CSTR           ALT CSTR
*[   ]              [      ]*
MACH/START WPT  END WPT
.81/PUMAL           □□□□□□□

<WIND             STEP ALTS>

<RETURN
 ESTAT
```

WRITE the end waypoint

The end waypoint must be part of the cruise.

ENTER it in the 4R field

GENERAL

Ident.: DSC-22_20-40-10-00012240.0001001 / 18 AUG 10
Applicable to: ALL

The performance function:
- Optimizes a flight plan
- Computes predictions.

OPTIMIZATION

Ident.: DSC-22_20-40-10-00012241.0001001 / 18 FEB 15
Applicable to: LV-GKO, LV-GKP

The FMGEC minimizes cost by optimizing the following items:
- Takeoff, approach, and go-around speeds (F, S, Green Dot, VAPP)
- Target speed for CLB, CRZ and DES phases (ECON SPD/MACH)
- Flight Level (for flight crew's information)
- Descent profile from CRZ FL down to the destination airport.

These items depend on the data the flight crew inserts during lateral and vertical flight planning and revision procedures.
Most are displayed on the PERF pages associated with the appropriate flight phases.

WIND PROFILE

To obtain the best predictions, the flight crew must enter the wind for the various flight phases and specifically for waypoints in cruise.

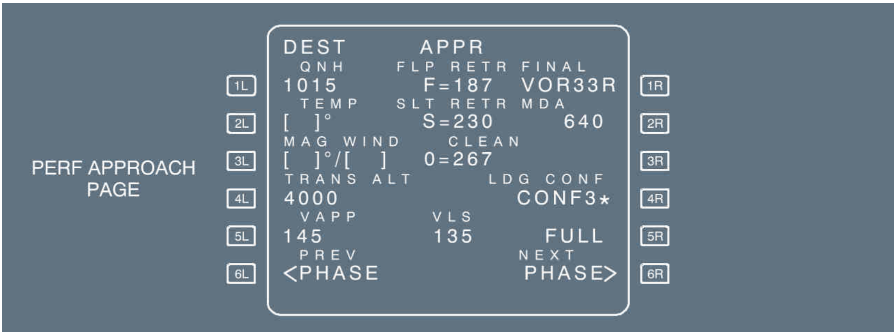
■ **ON GROUND:**
During flight planning initialization, enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter manually or with ACARS, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/ACARS entries.
The wind profile will be displayed on the F-PLN B page, and is called forecast wind profile. Flight crew or ACARS entries are displayed in large font, and system-computed winds in small font.

■ **IN FLIGHT:**
The system updates the predictions and the current ECON speed, using the measured wind at the present position. It combines actual wind and forecast winds to compute the wind ahead of the aircraft, but this is totally transparent to the flight crew.
During cruise, the flight crew will enter the descent winds and the approach wind. The system will update the final predictions, compute the optimum descent profile and compute the optimum speed in descent and approach.

The forecast wind profile will be used to compute fuel and time predictions, as well as ECON speed/Mach targets.

OPTIMUM TAKEOFF, APPROACH AND GO-AROUND SPEEDS

The FMGEC computes takeoff speeds (F, S, Green Dot) during the preflight and takeoff phases, using the performance model in the database and the takeoff weight.
The flight crew has to insert V1, VR, and V2 in the PERF TO page manually.
The FMGEC uses the performance model and either the predicted landing weight or the current gross weight at transition to the approach phase to compute approach speeds (VLS, VAPP, F, S, Green Dot). On the PERF APPR page, the selected LDG CONF determines the applicable VLS and VAPP, the latter being updated by the WIND correction that the flight crew enters on the same page. The FMGEC uses the performance model and gross weight to compute go-around speeds (F, S, Green Dot).


PERF APPROACH PAGE

```
DEST         APPR
  QNH        FLP RETR  FINAL
1015          F=187   VOR33R
  TEMP       SLT RETR  MDA
[  ]°         S=230      640
MAG WIND        CLEAN
[  ]°/[  ]    O=267
TRANS ALT          LDG CONF
4000               CONF3*
  VAPP         VLS
145            135      FULL
  PREV                NEXT
<PHASE               PHASE>
```

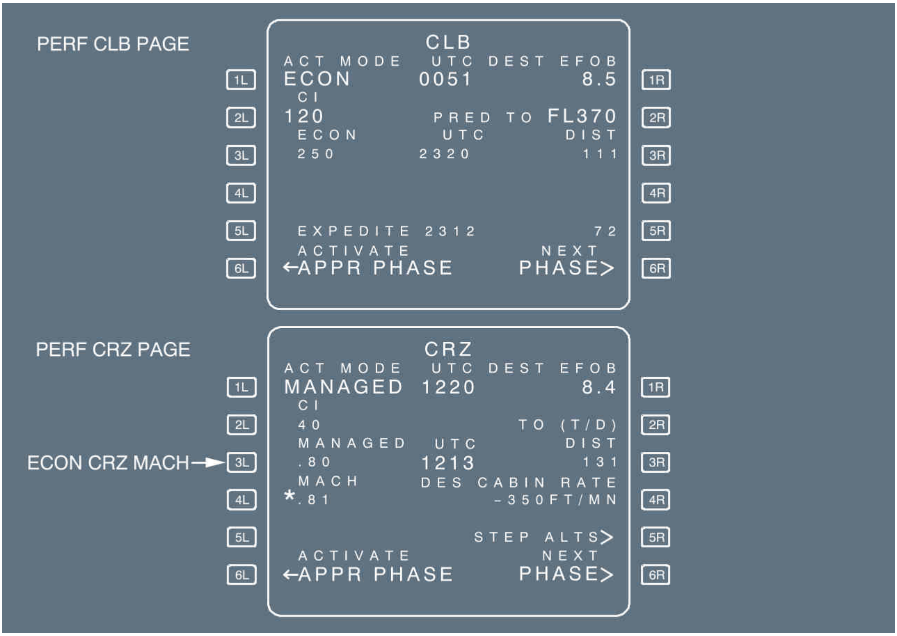
OPTIMUM TARGET SPEED FOR CLIMB, CRUISE AND DESCENT (ECON SPD/MACH)

The FMGES computes the optimum target speed (ECON SPD/MACH) as a function of:
- The Cost Index (CI)
- The Cruise Flight Level (CRZ FL)
- The Gross Weight (GW)
- The wind and temperature models
- The performance factor.

The computer processes the ECON SPDs for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.
When there is no time or speed constraint/limit, ECON SPEED is the optimum speed for the selected cost index. It refers to fuel and time cost and not directly to fuel saving.
The FM calculates ECON CLB speed before the climb phase begins, and this speed cannot be changed during the climb phase itself.

The ECON DES speed is used to compute the optimum descent profile and the associated top of descent (T/D).
The computer continually updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.

Note: *If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.*
If the cruise FL is above FL 250, ECON CRUISE MACH is computed.

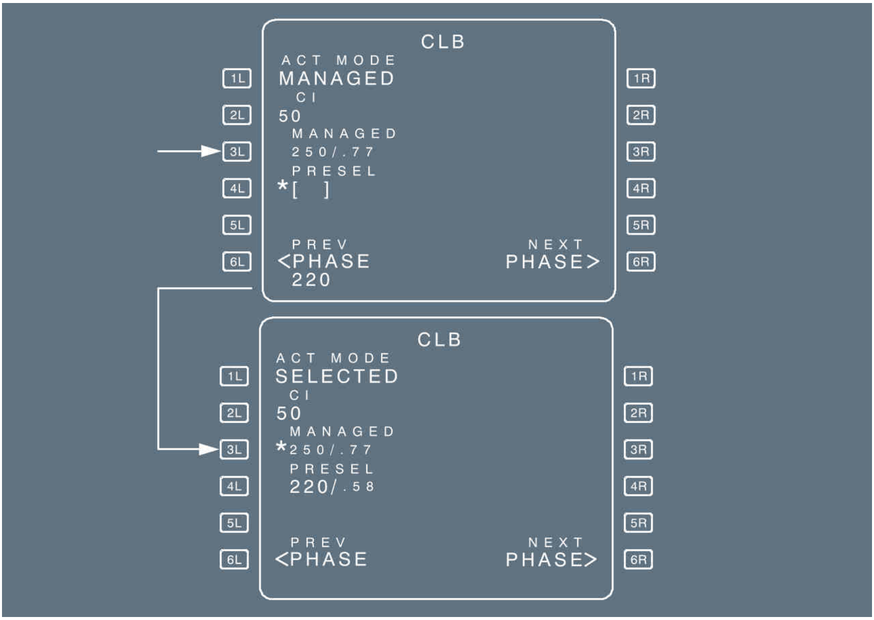


```
              CLB
ACT MODE      UTC  DEST EFOB
ECON          0051       8.5
  CI
120              PRED TO FL370
  ECON            UTC     DIST
  250             2320     111


  EXPEDITE 2312             72
  ACTIVATE               NEXT
←APPR PHASE            PHASE>
```

```
              CRZ
ACT MODE      UTC  DEST EFOB
MANAGED       1220       8.4
  CI
  40                 TO (T/D)
  MANAGED         UTC     DIST
  .80             1213     131
  MACH         DES CABIN RATE
*.81               -350FT/MN
                    STEP ALTS>
  ACTIVATE               NEXT
←APPR PHASE            PHASE>
```

PRESET TARGET SPEED FOR CLB PHASE

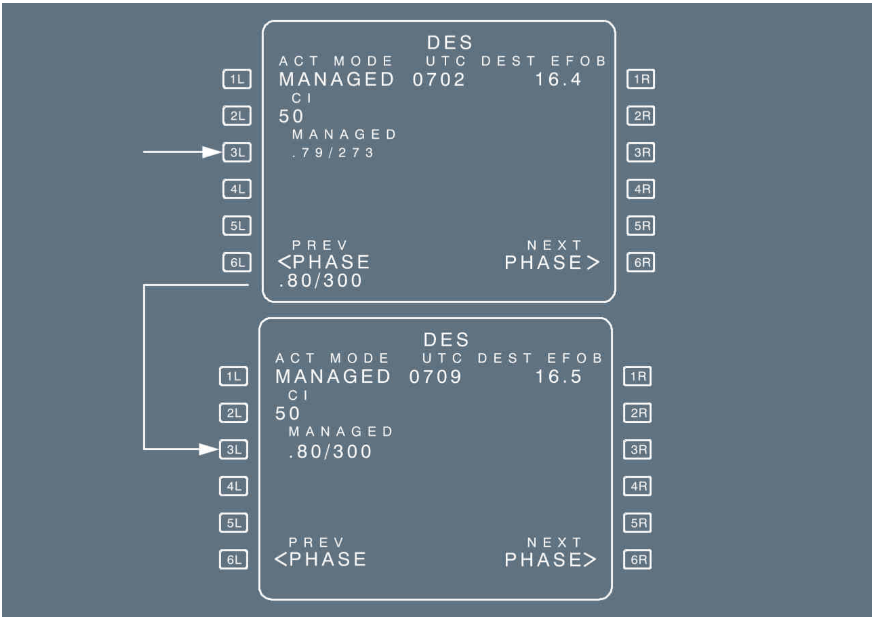
The flight crew can preselect the climb speed before the CLB phase begins, by inserting a speed in the PRESEL field:


CLB
ACT MODE
MANAGED
CI
50
MANAGED
250/.77
PRESEL
*[ ]
PREV
<PHASE
220
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CLB
ACT MODE
SELECTED
CI
50
MANAGED
*250/.77
PRESEL
220/.58
PREV
<PHASE
NEXT
PHASE>

The active mode field changes from MANAGED to SELECTED, and the FM will use the entered speed for climb predictions computation. The flight crew can revert to managed mode by pressing the 3L key.

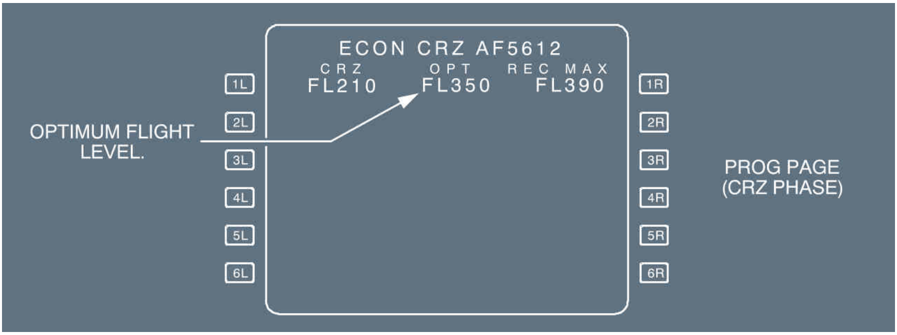
PRESET TARGET SPEED/MACH FOR DES PHASE

The flight crew can change the speed and/or Mach displayed in the MANAGED field, before the DES phase begins, by inserting a speed and/or Mach in the MANAGED field.
Although the entered speed is selected by the flight crew, the FMGES uses it to compute the descent flight path and the top of descent. It is therefore, part of the managed descent profile.


DES
ACT MODE
UTC DEST EFOB
MANAGED
0702
16.4
CI
50
MANAGED
.79/273
PREV
<PHASE
NEXT
PHASE>
.80/300
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
DES
ACT MODE
UTC DEST EFOB
MANAGED
0709
16.5
CI
50
MANAGED
.80/300
PREV
<PHASE
NEXT
PHASE>

The flight crew can revert to the optimum speed/Mach by clearing the 3L field.

OPTIMUM FLIGHT LEVEL


ECON CRZ AF5612
CRZ
FL210
OPT
FL350
REC MAX
FL390
OPTIMUM FLIGHT LEVEL.
PROG PAGE (CRZ PHASE)
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

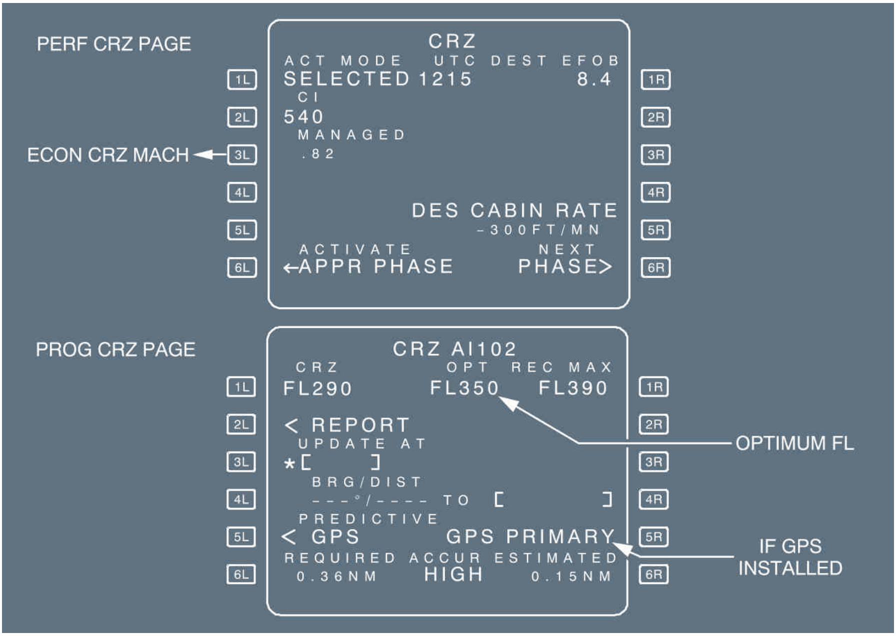
The optimum flight level indicates the most economic flight level for a given cost index, weight, weather data.
It requires a 15 min minimum cruise time. It is continuously updated in flight until 15 NM from the top of descent. It is dashed after this point.

The OPT FL is a compromise between fuel and time saving. As a result, the flight crew may observe jumps in OPT FL due to slight GW, ISA or wind changes.
The computation of the OPT FL considers the wind entries made at the different altitudes (normally at the different CRZ FL).
When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL; these winds are propagated automatically and may be significantly different from the actual winds.

Note: *For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGES and the FCOM/QRH values are different.*

The FM updates it continuously during the cruise phase, and displays it on the PROG page.

The PROG page displays dashes for this quantity:
- At least 15 NM before top of descent
- When the system detects an engine-out condition
- When DES phase is activated.



```
                 CRZ
ACT MODE      UTC  DEST EFOB
SELECTED 1215           8.4
 CI
540
 MANAGED
 .82


           DES CABIN RATE
                 -300FT/MN
 ACTIVATE             NEXT
←APPR PHASE         PHASE>
```

```
           CRZ AI102
 CRZ          OPT  REC MAX
FL290        FL350   FL390
< REPORT
 UPDATE AT
*[      ]
  BRG/DIST
  ---°/---- TO [          ]
 PREDICTIVE
< GPS          GPS PRIMARY
REQUIRED ACCUR ESTIMATED
 0.36NM     HIGH     0.15NM
```

OPTIMUM DESCENT PATH

The vertical flight path is computed to minimize fuel consumption while satisfying the various altitude constraints of the F-PLN and the descent speed profile in order to reach VAPP at 1 000 ft.

The computer calculates the descent profile before the descent phase is initiated, taking into account:
- All the lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated only if the flight plan is modified or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

OPTIMIZATION

Ident.: DSC-22_20-40-10-00012241.0007001 / 18 FEB 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The FMGEC minimizes cost by optimizing the following items:
- Takeoff, approach, and go-around speeds (F, S, Green Dot, VAPP)
- Target speed for CLB, CRZ and DES phases (ECON SPD/MACH)
- Flight Level (for flight crew's information)
- Descent profile from CRZ FL down to the destination airport.

These items depend on the data the flight crew inserts during lateral and vertical flight planning and revision procedures.
Most are displayed on the PERF pages associated with the appropriate flight phases.

WIND PROFILE

To obtain the best predictions, the flight crew must enter the wind for the various flight phases and specifically for waypoints in cruise.

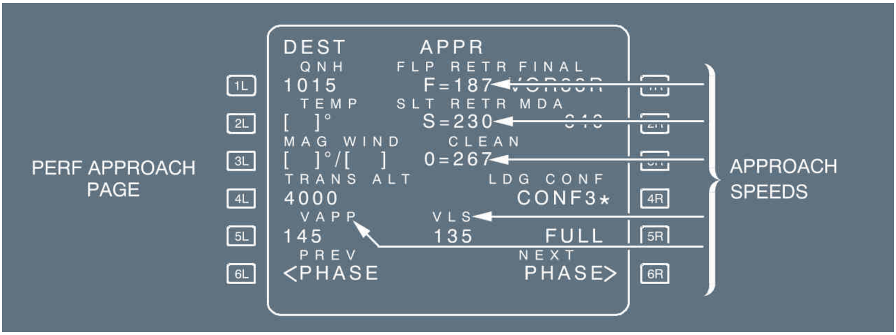
- **ON GROUND:**
  During flight planning initialization, enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter manually or with AOC, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/AOC entries.
  The wind profile will be displayed on the F-PLN B page, and is called forecast wind profile.
  Flight crew or AOC entries are displayed in large font, and system-computed winds in small font.

- **IN FLIGHT:**
  The system updates the predictions and the current ECON speed, using the measured wind at the present position. It combines actual wind and forecast winds to compute the wind ahead of the aircraft.
  During cruise, the flight crew will enter the descent winds and the approach wind. The system will update the final predictions, compute the optimum descent profile and compute the optimum speed in descent and approach.

The forecast wind profile will be used to compute fuel and time predictions, as well as ECON speed/Mach targets.

OPTIMUM TAKEOFF, APPROACH AND GO-AROUND SPEEDS

The FMGEC computes takeoff speeds (F, S, Green Dot) during the preflight and takeoff phases, using the performance model in the database and the takeoff weight.
The flight crew has to insert V1, VR, and V2 in the PERF TO page manually.
The FMGEC uses the performance model and either the predicted landing weight or the current gross weight at transition to the approach phase to compute approach speeds (VLS, VAPP, F, S, Green Dot). On the PERF APPR page, the selected LDG CONF determines the applicable VLS and VAPP, the latter being updated by the WIND correction that the flight crew enters on the same page. The FMGEC uses the performance model and gross weight to compute go-around speeds (F, S, Green Dot).

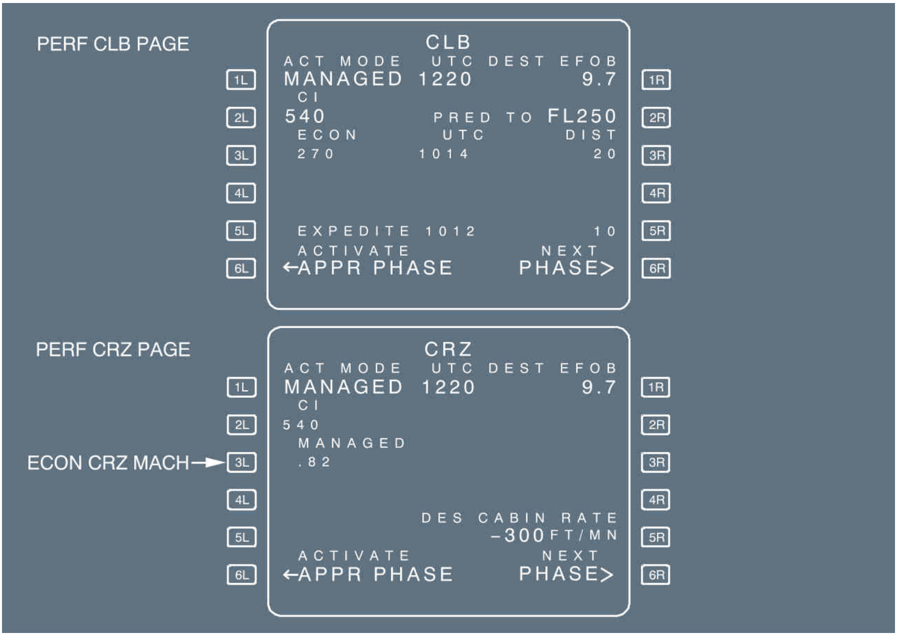

PERF APPROACH PAGE
DEST
APPR
QNH
FLP RETR
FINAL
1015
F=187
TEMP
SLT RETR
MDA
[ ]°
S=230
MAG WIND
CLEAN
[ ]°/[ ]
0=267
TRANS ALT
LDG CONF
4000
CONF3*
VAPP
VLS
145
135
FULL
PREV
<PHASE
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
4R
5R
6R
APPROACH SPEEDS

OPTIMUM TARGET SPEED FOR CLIMB, CRUISE AND DESCENT (ECON SPD/MACH)

The FMGES computes the optimum target speed (ECON SPD/MACH) as a function of:
- The Cost Index (CI)
- The Cruise Flight Level (CRZ FL)
- The Gross Weight (GW)
- The wind and temperature models
- The performance factor.

The computer processes the ECON SPDs for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.
When there is no time or speed constraint/limit, ECON SPEED is the optimum speed for the selected cost index. It refers to fuel and time cost and not directly to fuel saving.
The FM calculates ECON CLB speed before the climb phase begins, and this speed cannot be changed during the climb phase itself.
The ECON DES speed is used to compute the optimum descent profile and the associated top of descent (T/D).
The computer continually updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.

Note: *If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.*
If the cruise FL is above FL 250, ECON CRUISE MACH is computed.

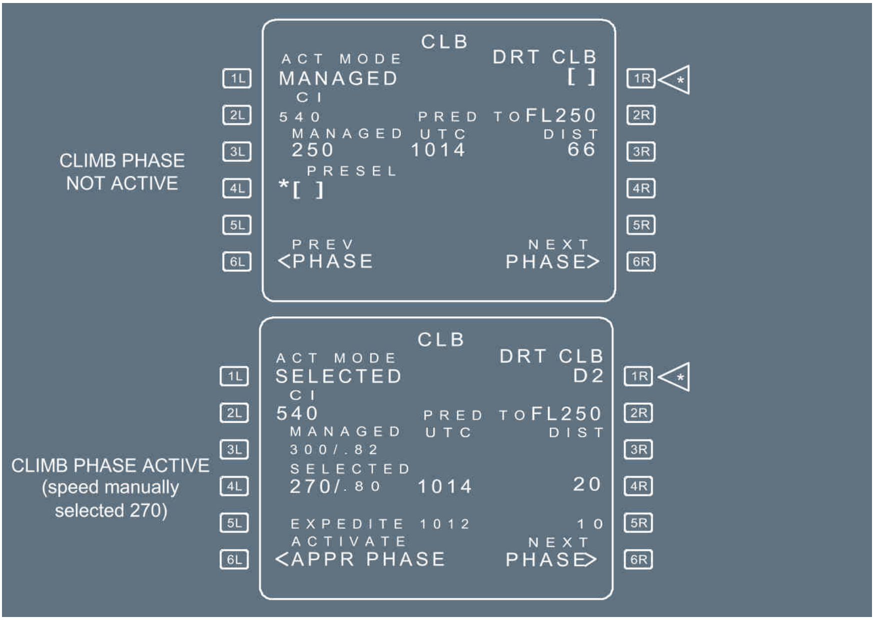


```
                 CLB
ACT MODE      UTC  DEST EFOB
MANAGED  1220          9.7
 CI
540             PRED TO FL250
 ECON            UTC      DIST
 270            1014        20


 EXPEDITE  1012             10
 ACTIVATE               NEXT
←APPR PHASE           PHASE>
```

```
                 CRZ
ACT MODE      UTC  DEST EFOB
MANAGED  1220          9.7
 CI
540
 MANAGED
 .82

            DES CABIN RATE
                 -300FT/MN
 ACTIVATE               NEXT
←APPR PHASE           PHASE>
```

PRESET TARGET SPEED FOR CLB PHASE

The flight crew can preselect the climb speed before the CLB phase begins, by inserting a speed in the PRESEL field:


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CLB
ACT MODE
MANAGED
DRT CLB
[ ]
CI
540
PRED TO FL250
MANAGED
250
UTC
1014
DIST
66
PRESEL
*[ ]
PREV
<PHASE
NEXT
PHASE>
CLB
ACT MODE
SELECTED
DRT CLB
D2
CI
540
PRED TO FL250
MANAGED
300/.82
UTC
DIST
SELECTED
270/.80
1014
20
EXPEDITE
1012
10
ACTIVATE
<APPR PHASE
NEXT
PHASE>

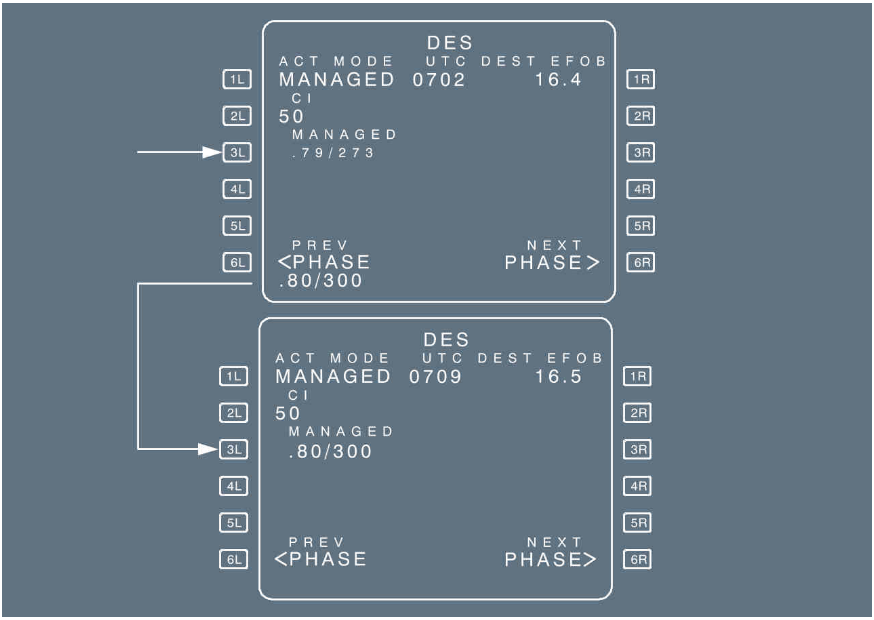
CLIMB PHASE NOT ACTIVE

CLIMB PHASE ACTIVE (speed manually selected 270)

The active mode field changes from MANAGED to SELECTED, and the FM will use the entered speed for climb predictions computation. The flight crew can revert to managed mode by pressing the 3L key.

PRESET TARGET SPEED/MACH FOR DES PHASE

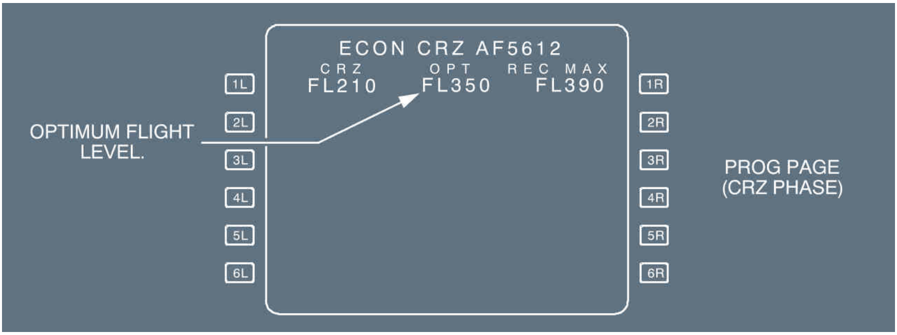
The flight crew can change the speed and/or Mach displayed in the MANAGED field by inserting a speed and/or Mach in the MANAGED field.
Although the entered speed is selected by the flight crew, the FMGES uses it to compute the descent flight path and the top of descent. It is therefore, part of the managed descent profile.


DES
ACT MODE UTC DEST EFOB
MANAGED 0702 16.4
CI
50
MANAGED
.79/273
PREV NEXT
<PHASE PHASE>
.80/300

DES
ACT MODE UTC DEST EFOB
MANAGED 0709 16.5
CI
50
MANAGED
.80/300
PREV NEXT
<PHASE PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

The flight crew can revert to the optimum speed/Mach by clearing the 3L field.

OPTIMUM FLIGHT LEVEL


ECON CRZ AF5612
CRZ OPT REC MAX
FL210 FL350 FL390
OPTIMUM FLIGHT LEVEL.
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
PROG PAGE (CRZ PHASE)

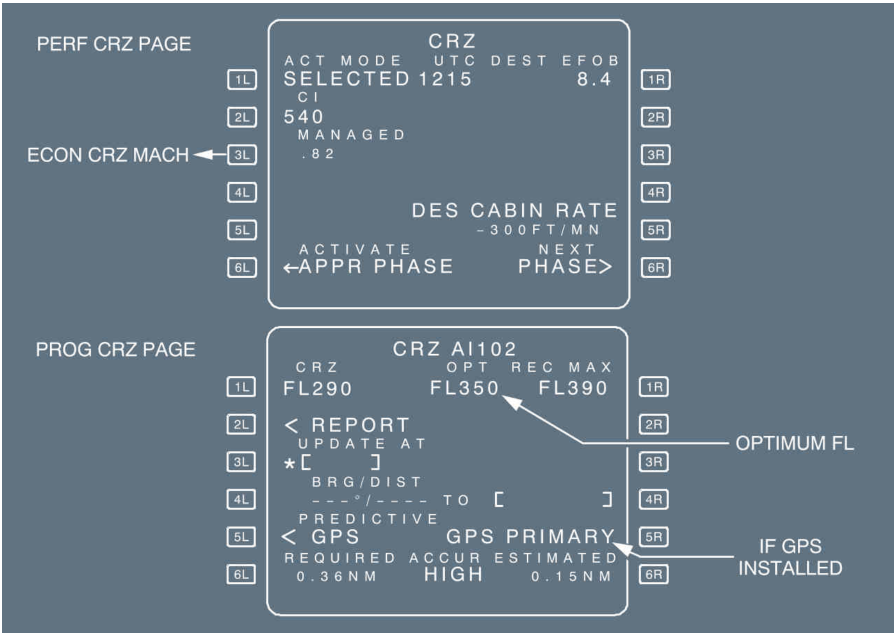
The optimum flight level (OPT FL) indicates the most economic flight level for a given cost index, weight, weather data.
It requires a 5 min minimum cruise time, at a minimum cruise flight level of FL 100. It is continuously updated in flight until the aircraft is predicted to reach the top of descent within 5 min.

The OPT FL is a compromise between fuel and time saving. As a result, the flight crew may observe jumps in OPT FL due to slight GW, ISA or wind changes.
The computation of the OPT FL considers the wind entries made by the flight crew, as well as the winds propagated by the FMS from previously entered winds.

Note: *For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGES and the FCOM/QRH values are different.*

The FM updates it continuously during the cruise phase, and displays it on the PROG page.

The PROG page displays dashes for this quantity:
- When the system detects an engine-out condition
- When DES phase is activated.



CRZ
ACT MODE UTC DEST EFOB
SELECTED 1215 8.4
CI
540
MANAGED
.82
DES CABIN RATE
-300FT/MN
ACTIVATE NEXT
←APPR PHASE PHASE>

CRZ AI102
CRZ OPT REC MAX
FL290 FL350 FL390
< REPORT
UPDATE AT
*[ ]
BRG/DIST
---°/---- TO [ ]
PREDICTIVE
< GPS GPS PRIMARY
REQUIRED ACCUR ESTIMATED
0.36NM HIGH 0.15NM

OPTIMUM DESCENT PATH

The vertical flight path is computed to minimize fuel consumption while satisfying the various altitude constraints of the F-PLN and the descent speed profile in order to reach VAPP at 1 000 ft.

The computer calculates the descent profile before the descent phase is initiated, taking into account:
- All the lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated only if the flight plan is modified or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

Intentionally left blank

COST INDEX (CI)

Ident.: DSC-22_20-40-20-00012222.0001001 / 18 AUG 10
Applicable to: ALL

The cost index is a fundamental input for the ECON SPEED or ECON MACH computation. ECON SPEED and ECON MACH reduce the total flight cost in terms of flight time and fuel consumption (and not only in terms of fuel saving).
CI is the ratio of flight time cost (CT) to fuel cost (CF).
CI = CT/CF (kg/min or 100 lb/h).
CI = 0 corresponds to minimum fuel consumption (MAX Range).
CI = 999 corresponds to minimum time.
CI = Long Range Cruise (*Refer to PRO-NOR-SRP-01-50 Preparation for Descent and Approach - Cost Index for Long-Range Cruise*).

It is recommended to modify the CI in flight:
- In case a fuel problem is encountered, CI = 0 may be selected. The ECON SPD profile is then computed to ensure minimum fuel consumption.
- In case the aircraft is behind its schedule, CI = 999 may be selected. The ECON SPD profile is then computed to ensure minimum time.

OPTIMUM STEP POINT

Only one optimum step point may be computed from the current cruise FL to a higher cruise FL. After insertion, the optimum step point is fixed and no longer updated.
The step altitude, time and fuel savings are provided before the insertion of an optimum step climb point on the STEP ALTS page.

Note: *The airline's operations department usually defines the cost index to optimize each company route. The flight crew does not ordinarily modify the cost index during a flight.*

Intentionally left blank

GENERAL

Ident.: DSC-22_20-40-30-00012136.0001001 / 18 AUG 10
Applicable to: ALL

The FMGEC computes predictions for the primary flight plan and the secondary flight plan and displays them on the Multipurpose Control and Display Units (MCDUs) and on the Navigation Display (ND) of the Electronic Flight Instrument System (EFIS).
The computations use the current state of the aircraft (GW, CG, position, altitude, speed, engaged mode of the autopilot or flight director, time, wind, temperature) for the active flight plan.

PREDICTIONS FOR THE PRIMARY FLIGHT PLAN

Ident.: DSC-22_20-40-30-00012137.0001001 / 18 AUG 10
Applicable to: ALL

The predictions displayed on the MCDU assume that the FMGES will guide the aircraft along the preplanned lateral and vertical flight plans.
The predictions displayed on the ND assume that the aircraft will continue to operate in the modes (selected or managed) that are currently active.
As long as the aircraft is flying the flight plan under managed guidance, the predictions on the MCDU will match those on the ND.

If the flight crew does not fly the flight plan, the MCDU predictions assume that:
- The flight crew will fly back towards the flight-planned route.
- The flight crew will immediately resume flying the FMGEC managed modes.

If the flight crew does not fly the managed speed profile, the MCDU predictions assume that they will maintain the selected speed until they reach:
- In the climb or descent phase, the next speed limit or speed constraint if any, or next phase
- In cruise, the top of descent.

Then, the predictions assume that the flight crew will revert to managed speed.

COMPUTATION OF PREDICTIONS

Ident.: DSC-22_20-40-30-00012138.0001001 / 18 AUG 10
Applicable to: ALL

The system calculates various predictions for the active flight plan and updates them continually during flight as functions of:
- Revisions to the lateral and vertical flight plans
- The cost index
- Current winds and temperature
- Present position versus lateral and vertical flight plans

- Current guidance modes
- Speed control (managed/selected).

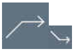
The MCDU and the ND show these predictions, each of which is based on specific assumptions.

Note: *During computation, prediction fields on the MCDU pages show dashes.*

PREDICTIONS DISPLAYED ON THE NAVIGATION DISPLAY

Ident.: DSC-22_20-40-30-00012139.0001001 / 01 OCT 12
Applicable to: ALL

These predictions consist of symbols positioned along the lateral flight plan (NAV mode engaged) or the track line (NAV mode not engaged). These symbols (named as pseudo waypoints) and their meanings are:

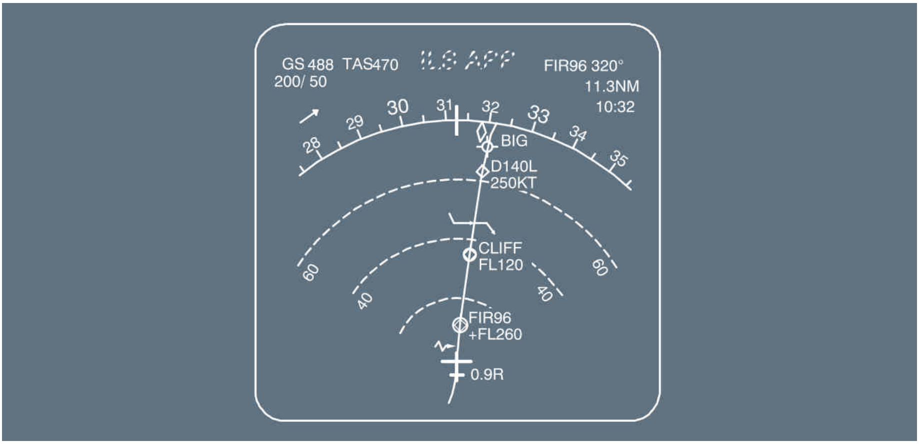
Pseudo waypoint	Definition
	Level symbol, at the position (top of climb or level-off) where the aircraft will reach: - The FCU selected altitude (blue arrow) - The constrained altitude, if it is more restrictive than the FCU altitude and if appropriate modes are engaged (magenta arrow).
	Top of descent or continue descent symbol: - Top of descent (always white) - Continue descent symbol (white if DES is not armed, blue if it is).
	Start of CLIMB symbol: - White if CLB is not armed - Blue if CLB is armed.
	Intercept point symbol: The point where the aircraft is predicted to intercept the descent path, if there is any vertical deviation when the aircraft is in DES mode (white if DES is not engaged, blue if it is).
•	Speed change symbol: The point at which the aircraft will initiate an automatic ACCEL or DECEL from current speed to a new computed speed if it encounters a SPD LIM, SPD CSTR, or HOLDING SPD (magenta).
	Decelerate point symbol: - Indicates the point at which the aircraft is predicted to decelerate for approach (and thus switch to the approach phase) - Magenta, if in managed speed and NAV or approach mode is engaged - White, if in selected speed or HDG/TRK mode - Automatic deceleration only occur when displayed in magenta.

Continued on the following page

Continued from the previous page

Pseudo waypoint	Definition
○	ALT CSTR symbol set around the constrained waypoint: - Magenta, when the ALT CSTR is predicted to be satisfied - Amber, when the ALT CSTR is predicted to be missed - White, when the ALT CSTR is not taken into account by the guidance, and the NAV mode is engaged.
◠	Energy circle symbol (green arc) centered on the aircraft position and oriented to the current track line. Represents the Required Distance to Land. Only displayed if the lateral guidance mode is heading or track, and the current FMS flight phase is in cruise, descent or approach, and the aircraft is within 180 NM of the destination.
Crosstrack error XX.XR or XX.XL (X is a number)	The crosstrack error displays the lateral deviation between the aircraft position and the track of the F-PLN active leg. The value is limited to 99.9 NM left or right.
INTCPT	Intercept waypoint is displayed on the ND at the point at which the present track intercepts the F-PLN.

The predicted time of arrival at the TO WPT is located in the upper right-hand corner of the ND. It assumes direct distance from the aircraft position to the TO WPT and assumes current ground speed will be constant.



As a general rule, the ND indicates what the aircraft will fly, with the current active FG modes.

For example:

- The continuous green line on the ND represents the track the aircraft is currently flying:
  - If HDG/TRK is engaged, the track line is green and the flight plan is dashed
  - If NAV mode is engaged, the green line is the flight plan.
- If the speed target is manually selected, the speed-change symbol is no longer displayed because it will not be taken into account.
- When the aircraft is not following the vertical flight plan (OP CLB,OP DES, V/S) but the NAV mode is engaged, the system disregards any altitude constraints and puts white circles around the waypoints that have these constraints and positions level symbols accordingly.
- Pseudo waypoints are adjusted each time predictions are updated.

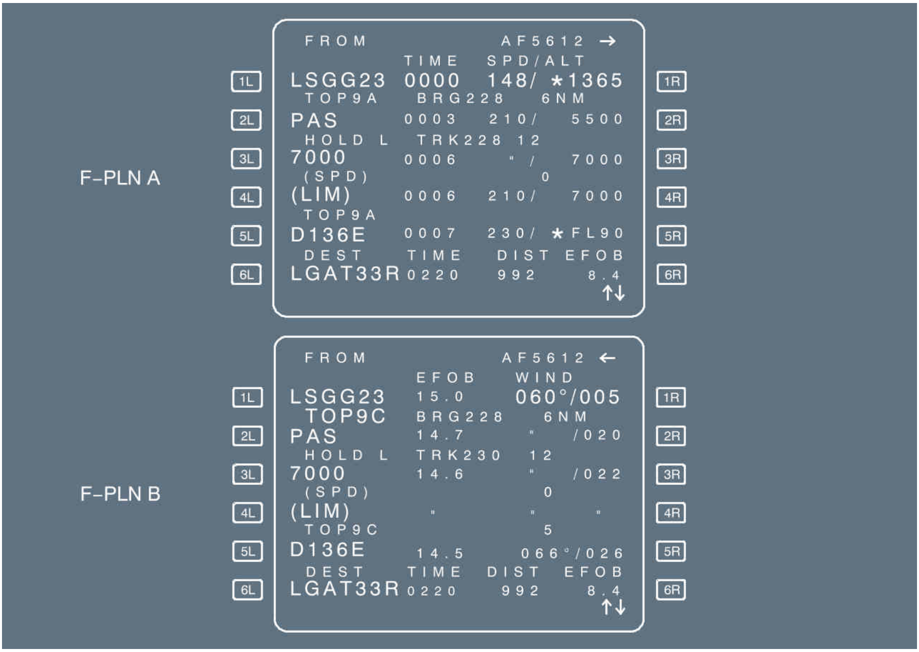
PREDICTIONS DISPLAYED ON THE MCDU

Ident.: DSC-22_20-40-30-00012140.0001001 / 14 MAY 12
Applicable to: ALL

The predictions displayed on the MCDU assume that AP (or FD order) is controlling the aircraft and flying it along the preplanned lateral and vertical flight plan.

Therefore:

- If the aircraft is guided along the flight plan (managed guidance), the MCDU predictions correspond exactly to what the aircraft is doing.
- If the aircraft is not guided along the flight plan (selected guidance), the MCDU predictions assume that it will return immediately to the flight plan, intercepting at a predetermined angle, and will then proceed under managed guidance.
- If the aircraft does not fly the managed speed profile (ECON, SPD CSTR...), the MCDU predictions assume that it will remain at the present selected speed/Mach until it reaches the next SPD CSTR or SPD LIM or enters the next flight phase.
- The TO waypoint information in the right upper corner are updated as if the aircraft would still fly toward it.



```
  FROM             AF5612 →
          TIME   SPD/ALT
LSGG23    0000   148/ *1365
  TOP9A    BRG228    6NM
PAS       0003   210/   5500
  HOLD L   TRK228 12
7000      0006    " /   7000
  (SPD)             0
(LIM)     0006   210/   7000
  TOP9A
D136E     0007   230/ *FL90
  DEST     TIME   DIST  EFOB
LGAT33R  0220     992    8.4
                          ↑↓
```

```
  FROM             AF5612 ←
          EFOB     WIND
LSGG23    15.0     060°/005
  TOP9C   BRG228    6NM
PAS       14.7     "   /020
  HOLD L  TRK230    12
7000      14.6     "   /022
  (SPD)             0
(LIM)      "       "      "
  TOP9C             5
D136E     14.5     066°/026
  DEST     TIME   DIST  EFOB
LGAT33R  0220     992    8.4
                          ↑↓
```

TYPE OF PREDICTIONS

Ident.: DSC-22_20-40-30-00012141.0004001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

	MCDU PAGE:
Pseudo waypoints: T/C, T/D, S/C, S/D, I/P, SPD LIM, DECEL	F-PLN A and B
TIME / SPD / ALT at each WPT and pseudo-WPT	F-PLN A
ETA / DIST TO DEST along F-PLN / EFOB at destination	F-PLN A and B
EFOB / T-WIND at each WPT and pseudo-WPT	F-PLN B
Constraint symbol * at each constrained WPT (TIME / SPD / ALT)	F-PLN A and B
Altitude error in case of missed ALT constraint	VERT REV
EFOB / EXTRA FUEL at each WPT	VERT REV
TIME / EFOB at destination	FUEL PRED / PERF CLB / CRZ / DES
TIME / DIST to a selected altitude	PERF CLB or DES
Fuel prediction prior engine start	INIT FUEL PRED
REC MAX FL	PROG
TIME / EFOB at Alternate	FUEL PRED
EXTRA FUEL for various Alternates	ALTN

Continued on the following page

Continued from the previous page

	MCDU PAGE:
VDEV from vertical flight path	PROG
Required Distance to Land	PROG
Direct Distance to Destination	PROG

TYPE OF PREDICTIONS

Ident.: DSC-22_20-40-30-00012141.0001001 / 18 AUG 10
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

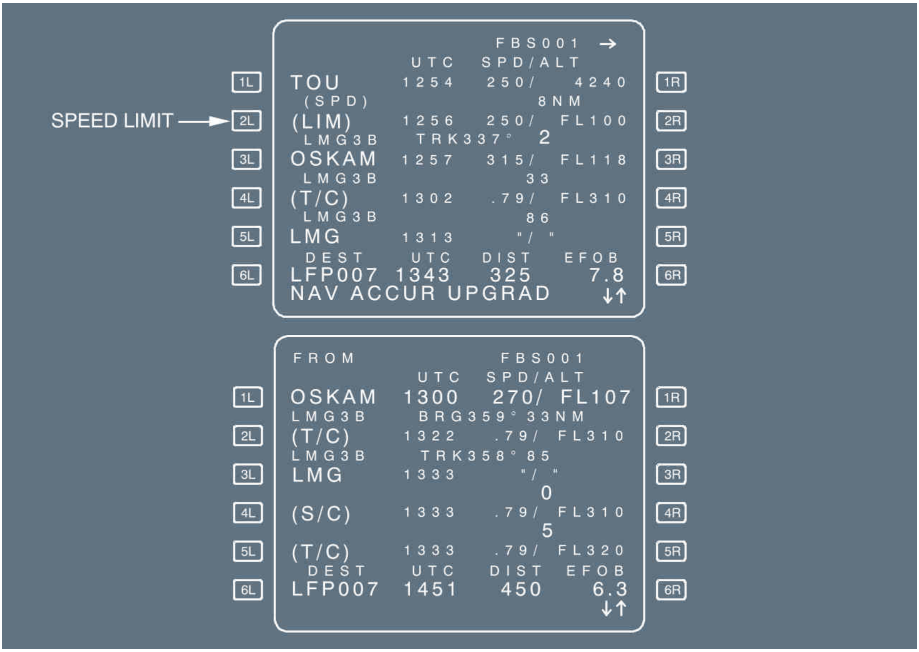
	MCDU PAGE:
Pseudo waypoints: T/C, T/D, S/C, S/D, I/P, SPD LIM, DECEL	F-PLN A and B
TIME / SPD / ALT at each WPT and pseudo-WPT	F-PLN A
ETA / DIST TO DEST along F-PLN / EFOB at destination	F-PLN A and B
EFOB / T-WIND at each WPT and pseudo-WPT	F-PLN B
Constraint symbol * at each constrained WPT (TIME / SPD / ALT)	F-PLN A and B
Altitude error in case of missed ALT constraint	VERT REV
EFOB / EXTRA FUEL at each WPT	VERT REV
TIME / EFOB at destination	FUEL PRED / PERF CLB / CRZ / DES
TIME / DIST to a selected altitude	PERF CLB or DES
Fuel prediction prior engine start	INIT B
REC MAX FL	PROG
TIME / EFOB at Alternate	FUEL PRED
XTRA FUEL for various Alternates	ALTN
VDEV vertical deviation from vertical flight path	PROG
Required Distance to Land	PROG
Direct Distance to Destination	PROG

EXAMPLES OF MCDU PREDICTIONS

Ident.: DSC-22_20-40-30-00012142.0001001 / 14 MAY 12
Applicable to: ALL

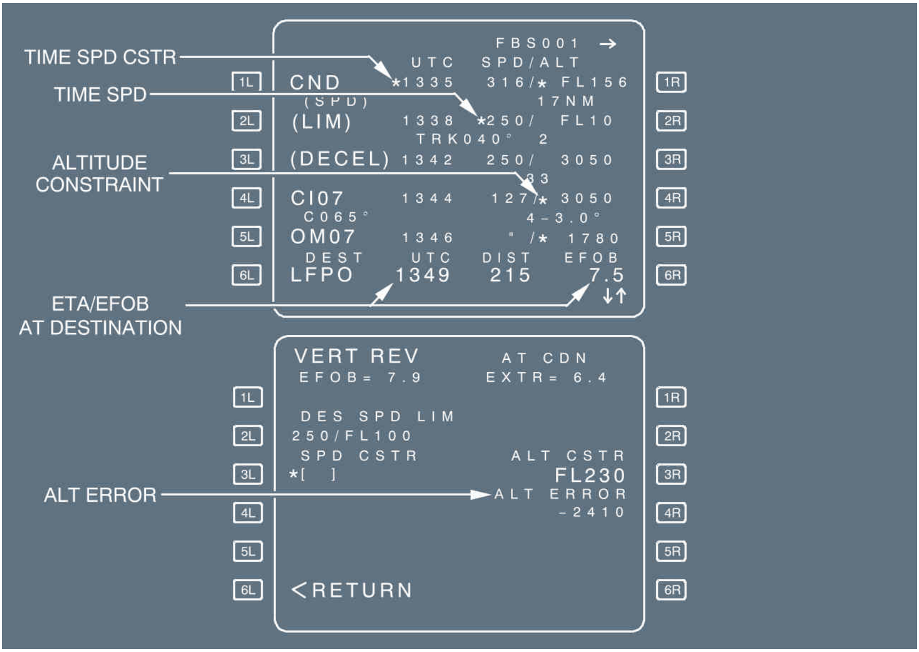
The following MCDU pages display some of the prediction types.

- Pseudo-waypoints:
  Top of Climb (T/C), Top-of-Descent (T/D), Start of Climb (S/C) or Start of Descent (S/D) for Step Climb/Descent, Speed Limit (SPD LIM), deceleration to approach phase (DECEL)
- Time, speed, and altitude predictions:
  TIME/SPD/ALT for all waypoints and pseudo-waypoints.



```
                      FBS001  →
             UTC   SPD/ALT
TOU          1254   250/   4240
  (SPD)                  8NM
(LIM)        1256   250/  FL100
  LMG3B       TRK337°   2
OSKAM        1257   315/  FL118
  LMG3B                33
(T/C)        1302   .79/  FL310
  LMG3B                86
LMG          1313     "/  "
  DEST       UTC   DIST    EFOB
LFP007 1343   325       7.8
NAV ACCUR UPGRAD           ↓↑
```

```
FROM                   FBS001
              UTC   SPD/ALT
OSKAM       1300   270/  FL107
LMG3B        BRG359° 33NM
(T/C)       1322    .79/  FL310
LMG3B        TRK358° 85
LMG         1333      "/  "
                        0
(S/C)       1333    .79/  FL310
                        5
(T/C)       1333    .79/  FL320
  DEST       UTC   DIST    EFOB
LFP007      1451    450     6.3
                             ↓↑
```



```
                     FBS001  →
          UTC     SPD/ALT
CND     *1335    316/*  FL156
 (SPD)                17NM
(LIM)    1338    *250/  FL10
           TRK040°    2
(DECEL)  1342     250/  3050
                      33
CI07     1344    127/*  3050
 C065°                4-3.0°
OM07     1346      " /*  1780
 DEST     UTC     DIST   EFOB
LFPO     1349     215    7.5
                          ↓↑
```

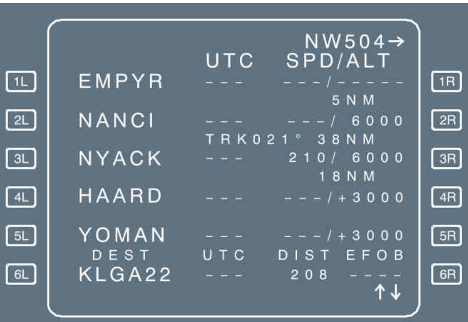
```
VERT REV           AT CDN
 EFOB= 7.9        EXTR= 6.4

 DES SPD LIM
250/FL100
 SPD CSTR             ALT CSTR
*[   ]                   FL230
                    ALT ERROR
                        -2410


<RETURN
```

CONSTRAINT SYMBOLS (STAR)

Ident.: DSC-22_20-40-30-00012143.0001001 / 14 MAY 12
Applicable to: ALL

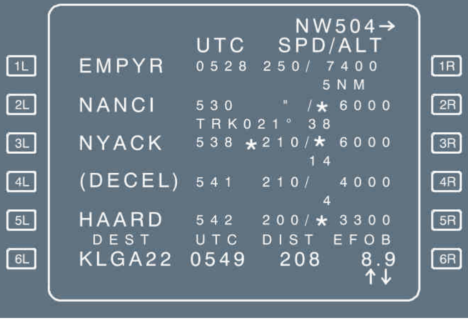
When a time speed or an altitude constraint is part of the vertical flight plan, it appears on the F-PLN A page only at the time of insertion, or when predictions are not yet available. Once available, the time speed and altitude predictions are displayed for all F-PLN waypoints: When a speed or an altitude constraint is at a waypoint, a star symbol appears adjacent to the speed or altitude prediction. If the star is magenta, the constraint is predicted to be matched. If the star is amber, the constraint is predicted to be missed.

F.PLN A PAGE DURING PREDICTION COMPUTATION



```
                        NW504→
           UTC        SPD/ALT
1L EMPYR   ---     ---/-----    1R
                       5NM
2L NANCI   ---     ---/ 6000    2R
          TRK021°  38NM
3L NYACK   ---     210/ 6000    3R
                      18NM
4L HAARD   ---     ---/+3000    4R
5L YOMAN   ---     ---/+3000    5R
    DEST   UTC     DIST EFOB
6L KLGA22  ---     208  ----    6R
                          ↑↓
```

F.PLN A PAGE ONCE PREDICTIONS AVAILABLE



```
                        NW504→
           UTC      SPD/ALT
1L EMPYR   0528   250/ 7400     1R
                      5NM
2L NANCI   530      " /★6000    2R
           TRK021°  38
3L NYACK   538   ★210/★ 6000    3R
                     14
4L (DECEL) 541    210/  4000    4R
                     4
5L HAARD   542    200/★ 3300    5R
    DEST   UTC    DIST  EFOB
6L KLGA22  0549   208    8.9    6R
                        ↑↓
```

Note: *If an altitude constraint is predicted as missed, the system tells you what will be the error at the specific waypoint.*

VERTICAL DEVIATION

Ident.: DSC-22_20-40-30-00012144.0001001 / 18 AUG 10

Applicable to: ALL

During descent, the system tells you how far you are from the computed descent profile (PFD and MCDU) and predicts where you may rejoin it.

VDEV on the PFD and PROG page, predictions on the MCDU F-PLN page, symbols on the ND display, allows you to assess your vertical position versus the computed flight profile.

The energy circle displayed on ND, representing the required distance to land from present position and current speed down to destination at VAPP, may also be used to tell you if you need to modify the flight path you intend to fly.

OPERATION RULES CONCERNING PREDICTIONS

Ident.: DSC-22_20-40-30-00012145.0001001 / 18 AUG 10
Applicable to: ALL

The flight crew must keep the flight plan data properly updated during the flight in order to get accurate and meaningful predictions.
The flight crew should rely on the ND for short-term predictions. It indicates what the aircraft will do under the currently engaged modes (selected or managed).
The flight crew should rely on the MCDU for long-term predictions when managed guidance is active or about to be reengaged.

OTHER COMPUTATIONS

Ident.: DSC-22_20-40-30-A-00012146.0001001 / 18 AUG 10
Applicable to: ALL

ENGINE-OUT CASE

The FMGES computes an engine-out target speed for each flight phase.
It computes an engine-out maximum altitude (EO MAX ALT) at long-range cruise speed, and displays it on the PROG page. The new speed target becomes Green Dot in climb phase or EO CRZ SPD in level flight.
The system computes the flight plan predictions down to the primary destination assuming that the cruise phase is at the lower of CRZ FL or EO MAX ALT.
For the engine-out obstacle strategy, the system computes a drift down descent at Green Dot and down to a level off altitude.

Ident.: DSC-22_20-40-30-A-00012147.0001001 / 18 AUG 10
Applicable to: ALL

FUEL PLANNING

After the F-PLN, CRZ FL, CI, ZFW, and ZFWCG insertion, the FMGEC may compute on flight crew request the minimum fuel to meet the requirements of the flight taking into account a predetermined fuel policy (Navigation Database).
Fuel predictions are automatically performed after the F-PLN, CRZ FL, and ZFW insertion. The FMGEC has to know the FOB either inserted by the flight crew (BLOCK FUEL) or computed by the system.

Ident.: DSC-22_20-40-30-A-00012148.0001001 / 18 AUG 10
Applicable to: ALL

EQUI-TIME POINT (ETP)

The ETP is a pseudo waypoint along the lateral flight plan at which the time to reach two reference waypoints is the same, taking distance and winds into account.

Ident.: DSC-22_20-40-30-A-00012149.0001001 / 18 AUG 10
Applicable to: ALL

TIME MARKER

This pseudo waypoint may be created for display on MCDU/ND.

Ident.: DSC-22_20-40-30-A-00012150.0001001 / 03 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

RECOMMENDED MAXIMUM ALTITUDE (REC MAX)

The recommended maximum altitude is the lowest of the maximum altitude that:
- The aircraft can reach with a 0.3 g buffet margin
- The aircraft can fly in level flight at MAX CRZ rating
- The aircraft can maintain a V/S of 300 ft/min at MAX CLB thrust
- The aircraft can fly at a speed above the Green Dot and below the VMO/MMO
- The aircraft is certified at.

The REC MAX altitude is displayed on the PROG page.
Anti-ice is not taken into account for this computation. If icing conditions are expected, use the performance application of the EFB.
A maximum altitude using a 0.2 g buffet margin is also computed. It is not displayed, but the system uses it to limit CRZ ALT entry.

Ident.: DSC-22_20-40-30-A-00012150.0003001 / 03 MAY 23
Applicable to: LV-GKO, LV-GKP

RECOMMENDED MAXIMUM ALTITUDE (REC MAX)

The recommended maximum altitude is the lowest of the maximum altitude that:
- The aircraft can reach with a 0.3 g buffet margin
- The aircraft can fly in level flight at MAX CRZ rating
- The aircraft can maintain a V/S of 300 ft/min at MAX CLB thrust
- The aircraft can fly at a speed above the Green Dot and below the VMO/MMO
- The aircraft is certified at.

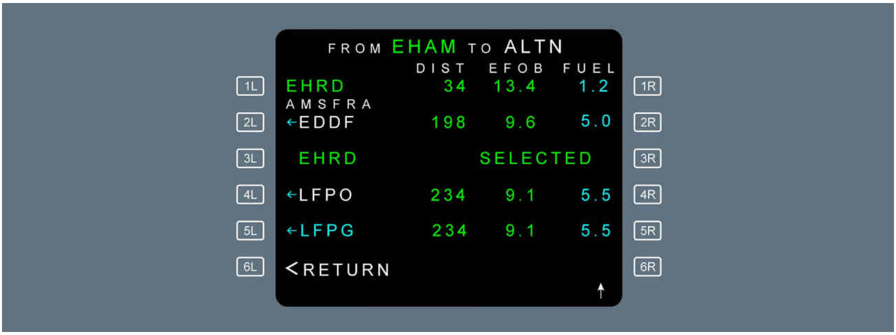
The REC MAX altitude is displayed on the PROG page.
Anti-ice is not taken into account for this computation. If icing conditions are expected, use the performance application of the EFB.
A maximum altitude using a 0.2 g buffet margin is also computed. It is not displayed, but the system uses it to limit CRZ ALT entry.

Note: *A REC MAX value exceeding FL 411 should be disregarded.*

Ident.: DSC-22_20-40-30-A-00012151.0004001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

PREDICTIONS FOR ALTERNATES

Predictions for alternates are displayed on the ALTERNATE page.



```
     FROM EHAM TO ALTN
              DIST  EFOB  FUEL
EHRD            34  13.4   1.2
AMSFRA
←EDDF          198   9.6   5.0
 EHRD            SELECTED
←LFPO          234   9.1   5.5
←LFPG          234   9.1   5.5
<RETURN
                             ↑
```

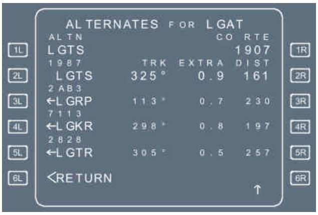
They are based on:
- A default cruise FL equal to 220 if the airway distance is less than 200 NM. Otherwise, it is FL 310
- Simplified wind/temperature models based on flight crew entries:
  - ALTN CRZ wind as entered in the primary DESCENT WIND page
  - Wind temperature at primary destination (APPR page).
    A zero wind and/or zero ISA deviation is assumed by default if there is no flight crew entry.
- Initial aircraft weight is equal to landing weight at primary destination
- A track equal to mean track between active primary and alternative destination
- A constant delta ISA and a constant cruise wind
- Cost index = 0 (minimum fuel).

Note: 1. *No step can be inserted in alternate flight plan.*
2. *No predictions are displayed for the selected alternate on flight plan pages, but the flight crew can read ALTN trip fuel and time on the INIT FUEL PRED page before engine start, and estimated time and estimated fuel on board at alternate on the FUEL PRED page after engine start.*

Ident.: DSC-22_20-40-30-A-00012151.0001001 / 18 AUG 10
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

PREDICTIONS FOR ALTERNATES

Predictions for alternates are displayed on the ALTERNATES page.



```
   ALTERNATES FOR LGAT
ALTN                    CO RTE
LGTS                      1907
1987          TRK  EXTRA  DIST
 LGTS         325°   0.9   161
2AB3
←LGRP         113°   0.7   230
7113
←LGKR         298°   0.8   197
2828
←LGTR         305°   0.5   257

<RETURN
                            ↑
```

They are based on:

- A default cruise FL equal to 220 if the airway distance is less than 200 NM. Otherwise, it is FL 310
- Simplified wind/temperature models based on flight crew entries:
  - ALTN CRZ wind as entered in the primary DESCENT WIND page.
  - Wind temperature at primary destination (APPR page)
    A zero wind and/or zero ISA deviation is assumed by default if there is no flight crew entry.
- Initial aircraft weight is equal to landing weight at primary destination
- A track equal to mean track between active primary and alternative destination
- A constant delta ISA and a constant cruise wind
- Cost index = 0 (minimum fuel).

Note: *1. No step can be inserted in alternate flight plan.*
2. No predictions are displayed for the selected alternate on flight plan pages, but the flight crew can read ALTN trip fuel and time on the INIT B page before engine start, and estimated time and estimated fuel on board at alternate on the FUEL PRED page after engine start.

Ident.: DSC-22_20-40-30-A-00012152.0001001 / 18 AUG 10
Applicable to: ALL

PREDICTIONS FOR SECONDARY FLIGHT PLAN

Predictions are provided on the SEC F-PLN, SEC INIT and SEC PERF pages as for the active primary flight plan.
However, the predictions are provided for the SEC F-PLN on the condition that primary and secondary flight plans have their active leg common (same TO WPT).

Ident.: DSC-22_20-40-30-A-00012153.0004001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

PREDICTIONS FOR FUEL

Up to 8 fuel policy records may be specified in the navigation database.
If a specific data is not provided in the database fuel policy, the value is the default value given here after:

PARAMETERS		DEFAULT VALUES
RTE RSV	(Percentage of route reserve)	5 %
RSV MIN	(Minimum value of route reserve)	0 kg
RSV MAX	(Maximum value of route reserve)	25 600 kg (56 500 lb)
RSV FLT	(Reserve remains computed in flight)	Yes
RSV ALTN	(Reserve is computed with alternate trip fuel)	No
FINAL TIME	(Time for final holding pattern)	30 min
FINAL FIX	(Fuel burnt in the final holding pattern)	0 kg
FINAL ALT	(Altitude for final holding pattern)	1 500 ft AGL
TAXI	(Fuel for taxi)	600 kg (1 300 lb)
FINAL DEST	(Final holding pattern is flown at ALTN)	ALTN

Furthermore, RTE RSV, FINAL TIME and TAXI may be modified on the MCDU through the INIT FUEL PRED or FUEL PRED pages.

Ident.: DSC-22_20-40-30-A-00012153.0001001 / 19 APR 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

PREDICTIONS FOR FUEL

Up to 8 fuel policy records may be specified in the navigation database.
If a specific data is not provided in the database fuel policy, the value is the default value given here after:

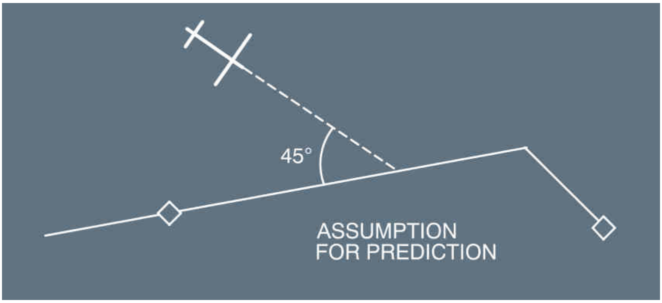
PARAMETERS		DEFAULT VALUES
RTE RSV	(Percentage of route reserve)	5 %
RSV MIN	(Minimum value of route reserve)	0 kg
RSV MAX	(Maximum value of route reserve)	25 600 kg (56 500 lb)
RSV FLT	(Reserve remains computed in flight)	yes
RSV ALTN	(Reserve is computed with alternate trip fuel)	no
FINAL TIME	(Time for final holding pattern)	30 min
FINAL FIX	(Fuel burnt in the final holding pattern)	0 kg
FINAL ALT	(Altitude for final holding pattern)	1 500 ft AGL
TAXI	(Fuel for taxi)	600 kg (1 300 lb)
FINAL DEST	(Final holding pattern is flown at ALTN)	ALTN

Furthermore, RTE RSV, FINAL TIME and TAXI may be modified on the MCDU through the INIT B or FUEL PRED pages.

RETURN-TO-TRAJECTORY ASSUMPTIONS

Ident.: DSC-22_20-40-30-00012154.0001001 / 19 DEC 12
Applicable to: ALL

If the aircraft is not on the lateral flight plan, the FMGEC assumes (for prediction) that it will return immediately to the active lateral leg with a 45 ° convergence angle or that it will fly directly to the "TO" waypoint whenever the required convergence angle is greater than 45 °.



If the flight crew flies outside the planned flight plan, predictions are still available but they assume an immediate return to flight plan.

INTRODUCTION TO PERF AND IDLE FACTORS

Ident.: DSC-22_20-40-30-00012155.0001001 / 21 MAR 17
Applicable to: ALL

The FMGES contains a performance database to compute the predictions and the performance data. This performance database has a model of several aircraft configurations (aircraft type/engine model) to tune the performance and the FMGES predictions. For some aircraft configurations, the model can differ from the real aircraft performance. In these cases, the FMGES has to correct the computation of the performance and the predictions. This is the aim of PERF and IDLE factors. With time, the real aircraft drag and engine performance can deviate from the nominal model. The airline Flight Operations should periodically revise the value of these factors to adapt FMGES predictions to actual aircraft performance.

PERF FACTOR

Applicable to: ALL

Ident.: DSC-22_20-40-30-B-00012157.0001001 / 28 JAN 13

GENERAL

The FMGES uses the PERF factor to correct the predicted fuel flow that is used for the computation of the fuel predictions.

The PERF factor modifies the predicted fuel flow, according to the following formula:

$$\text{FFpred} = \text{FFmodel} \times \left(1 + \frac{\text{PERF FACTOR}}{100}\right)$$

FFpred is the FF used for prediction.
FFmodel is the FF from the aero-engine model.

This correction is applied throughout the entire flight, and modifies the performance predictions and the ECON speed or Mach.
For example: Entering a PERF factor of +1.5 means that Flight Operations have evaluated the aircraft fuel deviation as 1.5 %, compared to the basic performance model (0.0).

IDLE FACTOR

Ident.: DSC-22_20-40-30-C-00014708.0001001 / 21 MAR 17
Applicable to: ALL

GENERAL

The FMGES uses the IDLE factor to adjust the computation of the vertical profile during the descent phase (IDLE segment).

The FMGES computes the vertical profile and the predictions from the Top of Descent (T/D) to the first altitude constraint with the following assumptions:
- The aircraft has a given thrust
- The aircraft has a given speed (within the speed target range).

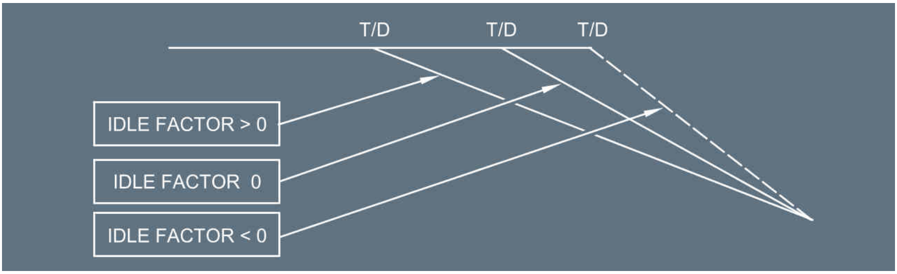
The IDLE Factor adjusts the value of the given thrust by an addition of a delta (DELTA) thrust to IDLE thrust. With this additional thrust, the IDLE Factor gives flexibility to maintain the aircraft on the computed vertical profile in case of external perturbations, such as windy conditions (previously entered by the flight crew in WIND pages).
Depending on the IDLE factor value, the FMGES modifies the position of the T/D and computes a vertical profile in function of the given thrust (IDLE + DELTA).

Therefore, the IDLE factor has a direct impact on:
- The computation of vertical profile
- The capability of the aircraft to maintain the vertical profile.

Ident.: DSC-22_20-40-30-C-00014709.0001001 / 21 MAR 17
Applicable to: ALL

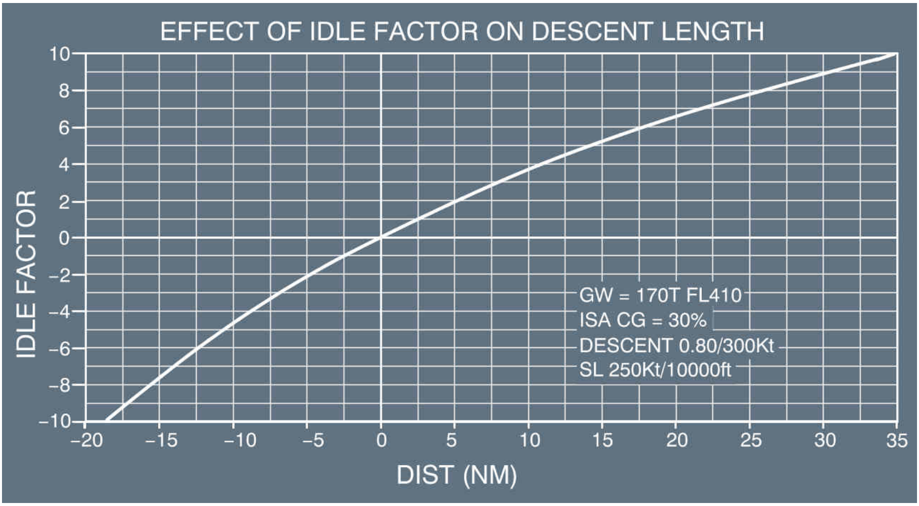
IMPACT ON VERTICAL PROFILE

- If the IDLE factor is positive, the vertical profile is less steep than with IDLE factor 0. The descent phase starts earlier.
- If the IDLE factor is negative, the descent path is steeper than with IDLE factor 0. The descent phase start later.



Ident.: DSC-22_20-40-30-C-00014714.0004001 / 28 JAN 13
Applicable to: LV-KHT, LV-KHU

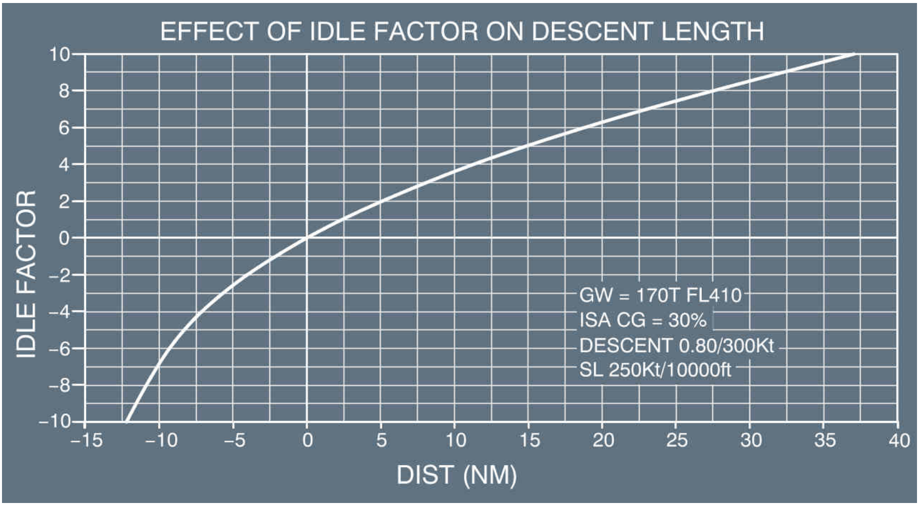
The following figure shows the IDLE factor effect on the descent length.



Example: IDLE factor of +4 increases the computed descent by 11 NM.

Ident.: DSC-22_20-40-30-C-00014714.0002001 / 28 JAN 13
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The following figure shows the IDLE factor effect on the descent length.

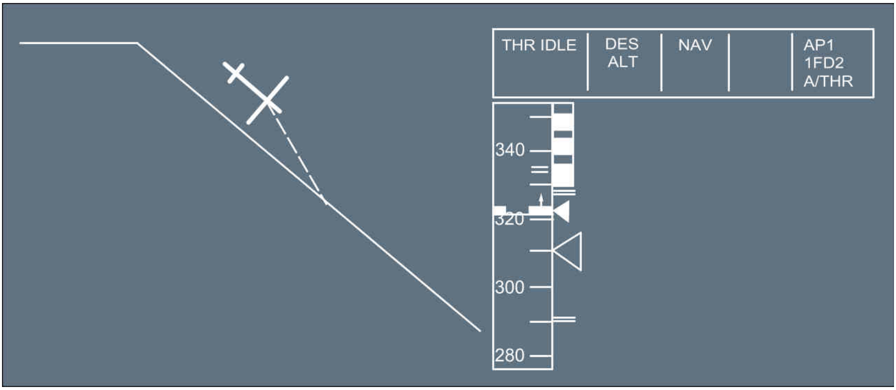


Example: IDLE factor of +4 increases the computed descent by 12 NM.

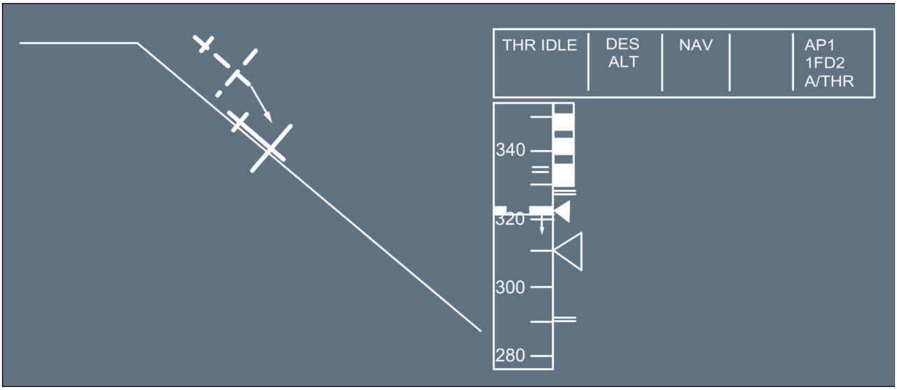
Ident.: DSC-22_20-40-30-C-00014710.0001001 / 30 JAN 13
Applicable to: ALL

IMPACT ON GUIDANCE

In DES mode, the FMGES maintains the aircraft on the vertical profile and keeps the IAS within the speed target range.
If the aircraft deviates above the profile, the IAS will increase to return to the vertical profile.



When the aircraft returns to the descent profile, the IAS will decrease to the target speed.



PROCEDURE TO MODIFY THE PERF AND IDLE FACTORS

Ident.: DSC-22_20-40-30-00014711.0001001 / 28 JAN 13
Applicable to: ALL

PROCEDURE TO MODIFY THE PERF AND IDLE FACTORS (ON GROUND ONLY)

- PRESS the MCDU DATA key and then the A/C STATUS prompt in order to access the A/C STATUS page.
- ENTER the change code in the CHG CODE field.
  The default value for this code is “ARM” but it is possible to modify it on airline request.

  The applicable code is then coded:
  - In the Airline Modifiable Information (AMI) file for aircraft with FMS2 Honeywell or Thales
  - In the Navigation Database policy file for aircraft with FMS1 Honeywell Legacy.

  When a valid change code is entered, the IDLE and PERF factors are displayed in blue.
- ENTER the new IDLE and PERF factors in the scratchpad separated by a "/".
  For example: "-2/+1"
- PRESS the corresponding key to insert the new IDLE and PERF factors.

The new IDLE and PERF factors are displayed in large blue font.

Note: *Only authorized personnel should take the responsibility to update the IDLE and PERF factor values.*

Intentionally left blank

TAKEOFF SURVEILLANCE FUNCTION

Ident.: DSC-22_20-45-10-10-00022057.0001001 / 05 JUN 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Takeoff Surveillance (TOS) function checks the takeoff data that the flight crew enters and selects on the FMS pages.
The takeoff surveillance function applies to the FMS pages that are associated with the active flight plan only.

The checks aim to ensure that the takeoff data is:
- Consistent
- Compatible with the aircraft performance data that is required for takeoff.

The FMS performs the following takeoff checks:
- The ZFW check
- The takeoff speeds check.

Ident.: DSC-22_20-45-10-10-00022058.0001001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ZFW CHECK

The FMS checks that the ZFW value that the flight crew enters on the FUEL PRED page is within the acceptable range.
If the entered ZFW is not within the acceptable range, the MCDU scratchpad displays the ENTRY OUT OF RANGE message.

Ident.: DSC-22_20-45-10-10-00022059.0002001 / 03 NOV 22
Applicable to: LV-KHT, LV-KHU

TAKEOFF SPEEDS CHECK

For the takeoff speeds (V1, VR, and V2) that the flight crew enters on the PERF TAKEOFF page of the MCDU:
- The FMS compares V1, VR, and V2.

  If the entered V1, VR, and V2 do not satisfy the condition V1≤VR≤V2:
  - The MCDU scratchpad displays the V1/VR/V2 DISAGREE message.
- The FMS checks that V1, VR, and V2 satisfy the regulatory requirements for the minimum speeds (VMCG, VMCA, VMU, and VS1G). If the entered V1, VR, and V2 do not satisfy the regulatory requirements for the minimum speeds (VMCG, VMCA, VMU, and VS1G):
  - The MCDU scratchpad displays the TO SPEED TOO LOW message.

Ident.: DSC-22_20-45-10-10-00022059.0011001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

TAKEOFF SPEEDS CHECK

For the takeoff speeds (V1, VR, and V2) that the flight crew enters on the PERF TAKEOFF page of the MCDU:

- The FMS checks that the V1, VR, and V2 entry fields contain values.

  If the flight crew does not enter one or more of the takeoff speed values, the ECAM triggers the T.O SPEEDS NOT INSERTED alert, when:
  - The flight crew presses the T.O CONFIG pb, or
  - The engines are set to takeoff power.

- The FMS compares V1, VR, and V2.

  If the entered V1, VR, and V2 do not satisfy the condition V1≤VR≤V2:
  - The MCDU scratchpad displays the V1/VR/V2 DISAGREE message.
  - The ECAM triggers the T.O V1/VR/V2 DISAGREE alert, when:
    - ■ The flight crew presses the T.O CONFIG pb, or
    - ■ The engines are set to takeoff power.

- The FMS checks that V1, VR, and V2 satisfy the regulatory requirements for the minimum speeds (VMCG, VMCA, VMU, and VS1G). If the entered V1, VR, and V2 do not satisfy the regulatory requirements for the minimum speeds (VMCG, VMCA, VMU, and VS1G):

  - The MCDU scratchpad displays the T.O SPEEDS TOO LOW message.
  - The ECAM triggers the T.O SPEEDS TOO LOW alert, when:
    - ■ The flight crew presses the T.O CONFIG pb, or
    - ■ The engines are set to takeoff power.

ASSOCIATED ALERTS AND MESSAGES

Ident.: DSC-22_20-45-10-30-00022062.0006001 / 05 JUN 18
Applicable to: LV-FVI, LV-KAN, LV-KAO

ASSOCIATED ALERTS

If the takeoff surveillance function of the FMS detects an abnormal situation, one or more of the following ECAM alerts are triggered:

- T.O SPEEDS NOT INSERTED
- T.O SPEEDS TOO LOW
- T.O V1/VR/V2 DISAGREE

Ident.: DSC-22_20-45-10-30-00022063.0002001 / 05 JUN 18

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ASSOCIATED MESSAGES

On the MCDU, the FMS message area displays the following messages:

- ENTRY OUT OF RANGE
- TO SPEED TOO LOW
- V1/VR/V2 DISAGREE .

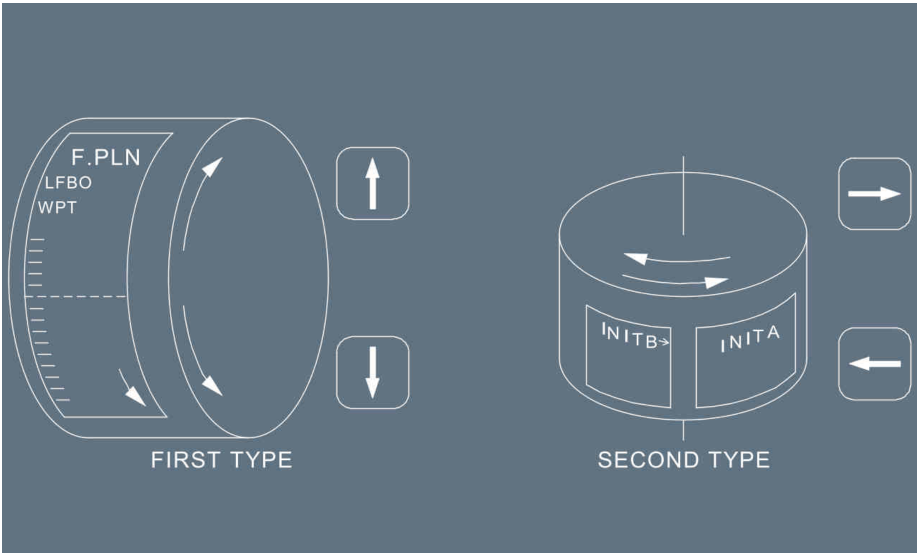
Intentionally left blank

FMS2 Honeywell

GENERAL

Ident.: DSC-22_20-50-10-25-00006608.0001001 / 16 MAR 11
Applicable to: ALL

The FMGES (flight management guidance and envelope system) displays information on various “pages”. When a page cannot display all the information assigned, it cues the pilot to call up additional information.
There are three types of pages, and each type has its particular way of cuing the pilot to call up additional information.



FIRST TYPE

When this page cannot display all the information on the screen simultaneously (more information than the six pairs of lines on the screen can hold), the pilot can scroll the page up or down. When this is the case, the screen displays a ↑ ↓ symbol in its bottom righthand corner (F-PLN pages, secondary F-PLN page, departure/arrival pages,...).

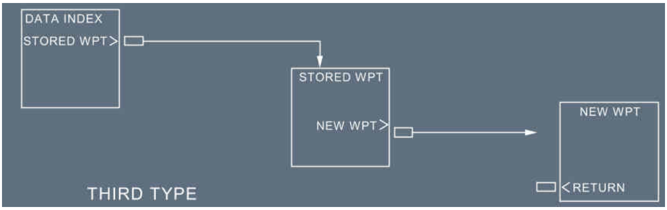
SECOND TYPE

When successive pages hold the information, the pilot presses the [→] [←] keys to call up these pages sequentially.

In this case, the page displays an arrow in the top right hand corner of the screen (INIT pages).

THIRD TYPE

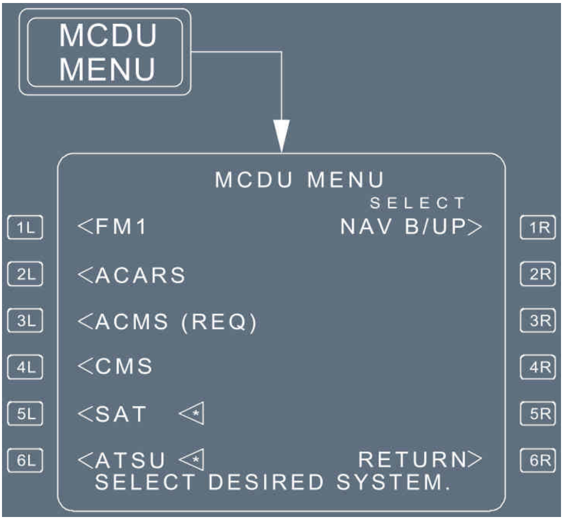
When successive pages hold different types of information, the pilot calls these up by pressing the key adjacent to the prompts >, < or *.


DATA INDEX
STORED WPT>
STORED WPT
NEW WPT>
NEW WPT
<RETURN
THIRD TYPE

MCDU MENU PAGE

Ident.: DSC-22_20-50-10-25-00006640.0001001 / 22 MAR 16
Applicable to: ALL

This page lists the various systems to which the pilot can gain access through the MCDU. It also allows activation of the navigation backup mode.


MCDU MENU
MCDU MENU
SELECT
<FM1
NAV B/UP>
<ACARS
<ACMS (REQ)
<CMS
<SAT ◁*
<ATSU ◁*
RETURN>
SELECT DESIRED SYSTEM.
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

The pilot selects a system by pressing the key adjacent to the name of that system. The screen shows the name of the selected system in green, all others in white.
If the MCDU cannot establish communication with the selected system, it displays “TIME OUT”.

When a system calls for pilot attention, the MCDU displays “REQ” next to the system name, and the “MCDU MENU” annunciator lights up.
When the pilot presses the key next to the name of the system that requires attention, the “MCDU MENU” annunciator light goes out.

SELECT NAV B/UP	Pressing the [1R] key selects the NAV B/UP function and the field displays DESELECT NAV B/UP. If the NAV B/UP is inoperative, the field is blank.
RETURN	This field is displayed when a function is active

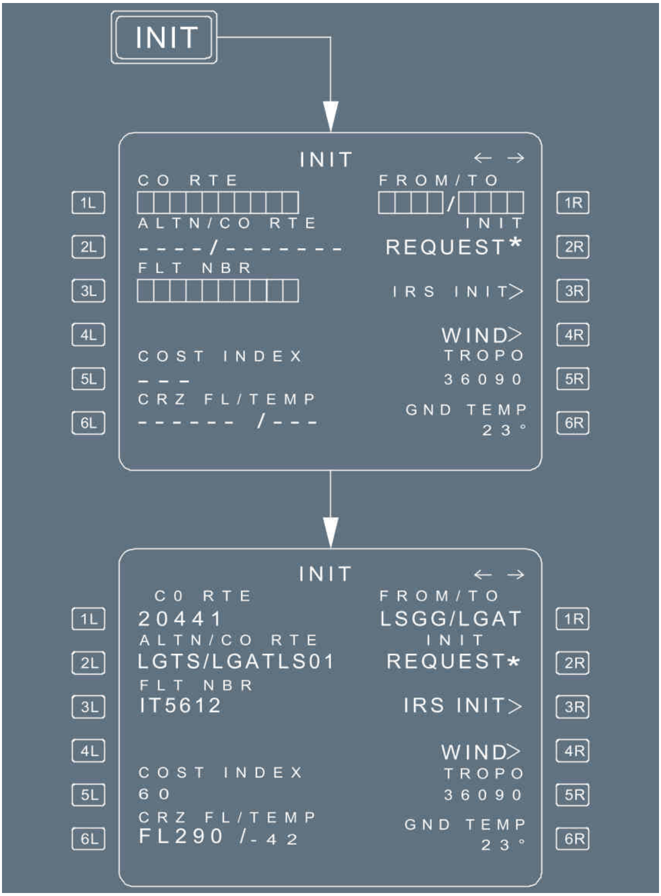
If the MCDU attempts to communicate with a system, “SEL” is displayed next to the system name.

INIT A PAGE

Ident.: DSC-22_20-50-10-25-00006643.0008001 / 01 MAR 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The flight crew uses the INIT A page to initialize the flight plan and align the inertial reference system.

- During the entire flight, the flight crew can access this page by pressing the INIT key on the MCDU console.
- The flight crew may also call up this page by:
  - Pressing the [→] or [←] keys on the MCDU console, while INIT FUEL PRED page is selected, or
  - Pressing the key next to “RETURN” or “INSERT” on the route selection page, or
- The flight crew may press the INIT key when in the done phase, to begin the next preflight phase.

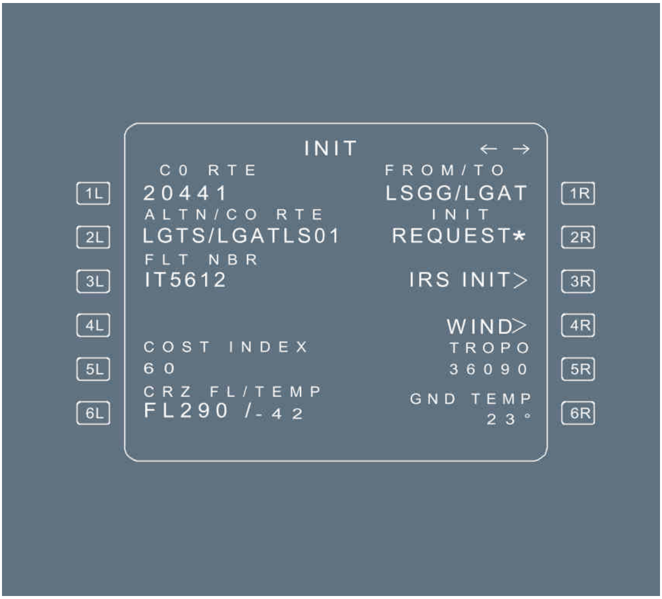


INIT ← →
CO RTE ☐☐☐☐☐☐☐☐☐☐
FROM/TO ☐☐☐☐/☐☐☐☐
ALTN/CO RTE ----/-------
INIT REQUEST*
FLT NBR ☐☐☐☐☐☐☐☐☐☐
IRS INIT>
WIND>
COST INDEX ---
TROPO 36090
CRZ FL/TEMP ------ /---
GND TEMP 23°

INIT ← →
CO RTE 20441
FROM/TO LSGG/LGAT
ALTN/CO RTE LGTS/LGATLS01
INIT REQUEST*
FLT NBR IT5612
IRS INIT>
WIND>
COST INDEX 60
TROPO 36090
CRZ FL/TEMP FL290 /-42
GND TEMP 23°

[1L] CO RTE	If the flight crew enters a company route number, the screen displays all data associated with that route (10 characters maximum). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.

[2L] ALTN/CO RTE (blue)	This field is dashed until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination, it is displayed in this field with the company route identification. The pilot may enter an alternate and a company route manually. If preferred alternate is not associated with the primary destination, “NONE” is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays “DEST/ALTN MISMATCH”. If the primary destination is changed, this field is modified accordingly. The pilot may modify it during the flight.
[3L] FLT NBR	The flight number automatically appears in this field, if it is stored with the company route. The pilot may modify it, or enter a new number here.
[5L] COST INDEX	This is usually stored in the database, along with the company route. The pilot may modify it, or enter a new value here. The system defaults to the last entered value, if a value is not stored in the database.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the database, along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not provide predictions while the aircraft is on ground. The pilot has to enter the temperature at cruise flight level, in order to refine the predictions. Otherwise, these are computed for ISA conditions. (If no sign is entered, the system uses plus).
[1R] FROM/TO	This field allows the pilot to enter a city pair (ICAO codes for city of origin and destination). This entry automatically deletes any previously-entered company route, and calls up the route selection page. If one airfield of the pair is not in the database, the display changes to the NEW RWY page.



```
                 INIT                 ← →
 CO RTE                   FROM/TO
20441                     LSGG/LGAT
ALTN/CO RTE                  INIT
LGTS/LGATLS01             REQUEST*
FLT NBR
IT5612                    IRS INIT>

                             WIND>
COST INDEX                   TROPO
60                           36090
CRZ FL/TEMP               GND TEMP
FL290 /-42                     23°
```

[2R] INIT REQUEST	This prompt is displayed, if the pilot did not enter an active flight plan, or entered a flight number or a company route that is not in the aircraft database. Selecting this prompt sends the ground a request for active flight plan initialization (downlink message). When the asterisk is not displayed, a downlink message cannot be sent. The uplink flight plan is automatically inserted in the active flight plan, prior to engine start, provided an active flight plan does not exist. After engine start, the uplink flight plan is sent to the secondary flight plan, and manually inserted or rejected.
[3R] IRS INIT	The pilot presses this key to access the IRS INIT page.
[4R] WIND	The pilot presses this key to access the climb wind page, unless a temporary flight plan exists. If this is case, the scratchpad displays “TEMPORARY F-PLN EXISTS”.
[5R] TROPO	The default tropopause altitude is 36 090 ft. The pilot can use this field to modify it (60 000 ft maximum).

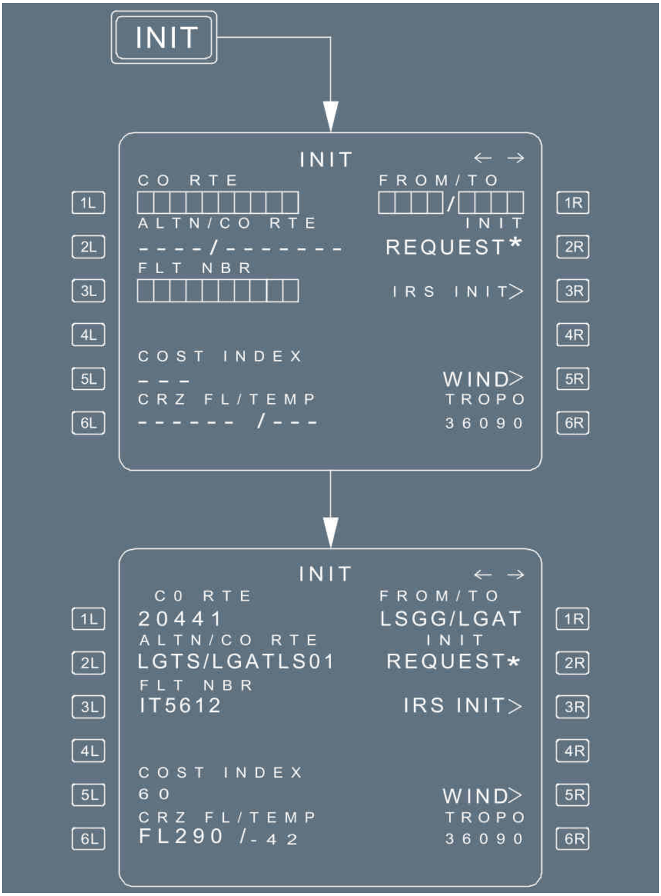
[6R] GND TEMP	The flight crew can use this field to insert the ground temperature (in Celsius) during the cockpit preparation. The FMS uses this value to compute the ISA deviation profile for the Climb segment. When no flight crew entry exists, or if the flight crew entry is cleared, the GND TEMP value reverts to the default ISA value at the selected Departure Airport altitude.

INIT A PAGE

Ident.: DSC-22_20-50-10-25-00006643.0004001 / 01 MAR 18
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

The pilot uses the INIT A page to initialize the flight plan and align the inertial reference system.

- During the entire flight, the pilot can access this page by pressing the INIT key on the MCDU console.
- The pilot may also call up this page by:
  - Pressing the [→] or [←] keys on the MCDU console, while INIT B page is selected, or
  - Pressing the key next to “RETURN” or “INSERT” on the route selection page, or
- The pilot may press the INIT key when in the done phase, to begin the next preflight phase.

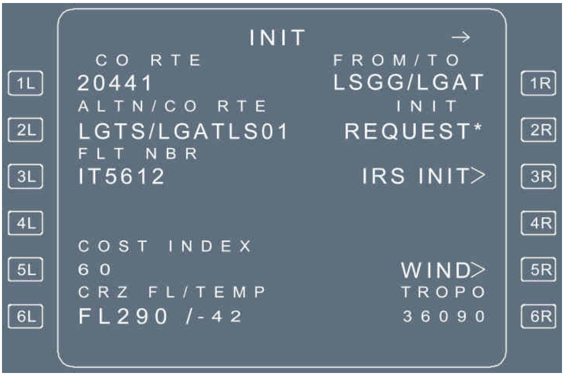


```
              INIT                      ← →
CO RTE                         FROM/TO
☐☐☐☐☐☐☐☐☐☐                     ☐☐☐☐/☐☐☐☐
ALTN/CO RTE                           INIT
----/-------                   REQUEST*
FLT NBR
☐☐☐☐☐☐☐☐☐☐                      IRS INIT>

COST INDEX
---                                WIND>
CRZ FL/TEMP                        TROPO
------ /---                        36090
```

```
              INIT                      ← →
 C0 RTE                        FROM/TO
20441                          LSGG/LGAT
ALTN/CO RTE                       INIT
LGTS/LGATLS01                  REQUEST*
FLT NBR
IT5612                          IRS INIT>

COST INDEX
60                                 WIND>
CRZ FL/TEMP                        TROPO
FL290 /-42                         36090
```

[1L] CO RTE	If the flight crew enters a company route number, the screen displays all data associated with that route (10 characters maximum). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.

[2L] ALTN/CO RTE (blue)	This field is dashed until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination, it is displayed in this field with the company route identification. The pilot may enter an alternate and a company route manually. If preferred alternate is not associated with the primary destination, “NONE” is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays “DEST/ALTN MISMATCH”. If the primary destination is changed, this field is modified accordingly. The pilot may modify it during the flight.
[3L] FLT NBR	The flight number automatically appears in this field, if it is stored with the company route. The pilot may modify it, or enter a new number here.
[5L] COST INDEX	This is usually stored in the database, along with the company route. The pilot may modify it, or enter a new value here. The system defaults to the last entered value, if a value is not stored in the database.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the database, along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not provide predictions while the aircraft is on ground. The pilot has to enter the temperature at cruise flight level, in order to refine the predictions. Otherwise, these are computed for ISA conditions. (If no sign is entered, the system uses plus).
[1R] FROM/TO	This field allows the pilot to enter a city pair (ICAO codes for city of origin and destination). This entry automatically deletes any previously-entered company route, and calls up the route selection page. If one airfield of the pair is not in the database, the display changes to the NEW RWY page.



```
                INIT                 →
   CO RTE                     FROM/TO
20441                     LSGG/LGAT
ALTN/CO RTE                    INIT
LGTS/LGATLS01              REQUEST*
FLT NBR
IT5612                     IRS INIT>


COST INDEX
60                            WIND>
CRZ FL/TEMP                   TROPO
FL290 /-42                    36090
```

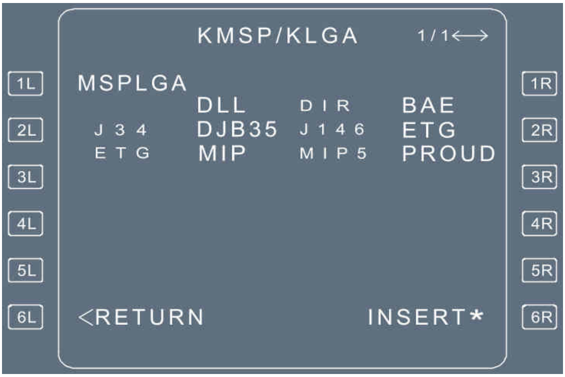
[2R] INIT REQUEST	This prompt is displayed, if the pilot did not enter an active flight plan, or entered a flight number or a company route that is not in the aircraft database. Selecting this prompt sends the ground a request for active flight plan initialization (downlink message). When the asterisk is not displayed, a downlink message cannot be sent. The uplink flight plan is automatically inserted in the active flight plan, prior to engine start, provided an active flight plan does not exist. After engine start, the uplink flight plan is sent to the secondary flight plan, and manually inserted or rejected.
[3R] IRS INIT	The pilot presses this key to access the IRS INIT page.
[5R] WIND	The pilot presses this key to access the climb wind page, unless a temporary flight plan exists. If this is case, the scratchpad displays “TEMPORARY F-PLN EXISTS”.
[6R] TROPO	The default tropopause altitude is 36 090 ft. The pilot can use this field to modify it (60 000 ft maximum).

ROUTE SELECTION PAGE

Ident.: DSC-22_20-50-10-25-00006664.0001001 / 17 MAR 11
Applicable to: ALL

This page displays all the company routes stored in the data base that are associated with the inserted city pair. The pilot may call it up manually, or it may be displayed automatically.

- Manually : The pilot presses the FROM/TO or ALTN key on the INIT A page when a city pair is displayed there.
- Automatically : The system displays it when the pilot enters a city pair or defines an alternate on the INIT A page of the active or secondary flight plan, or when the flight crew enters an OTHER ALTN on the alternate page.



```
             KMSP/KLGA        1/1<->
MSPLGA
             DLL       DIR    BAE
  J34        DJB35     J146   ETG
  ETG        MIP       MIP5   PROUD



<RETURN                    INSERT*
```

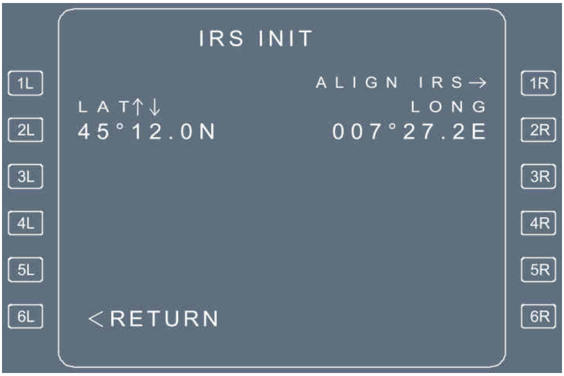
TITLE	Idents for the city pair inserted on the INIT A page. If the flight crew accesses this page from an OTHER ALTN, this field displays the primary destination and the other alternate city pair. (The numbers in the upper righthand corner are the total number of company routes from this city pair stored in the data base).
[1L]	This field shows the name of the company route displayed on the page.
Line 2 to Line 5	These fields display the various elements of the company route (waypoints in green large font and airways in white small font).
[6L] RETURN	The pilot presses this key to return to the accessing page.
[6R] INSERT or SELECT	This prompt displays amber INSERT (blue for the secondary flight plan) if the pilot accessed the page from the INIT A (or secondary INIT A) page. It displays SELECT (blue) if the crew accessed the page from the alternate page. The pilot presses this key to insert the displayed company route in the respective flight plan and return the display to the accessing page.

Note: *The pilot can slew the display to show the rest of the route if one page does not show it all, or to display other company routes for this city pair.*

IRS INIT PAGE

Ident.: DSC-22_20-50-10-25-00006668.0001001 / 17 MAR 11
Applicable to: LV-GKO, LV-GKP

The pilot uses the IRS INIT page to align the inertial reference system. The pilot accesses this page by pressing the IRS INIT key on the INIT A page.



IRS INIT

ALIGN IRS→

LAT↑↓ LONG

45°12.0N 007°27.2E

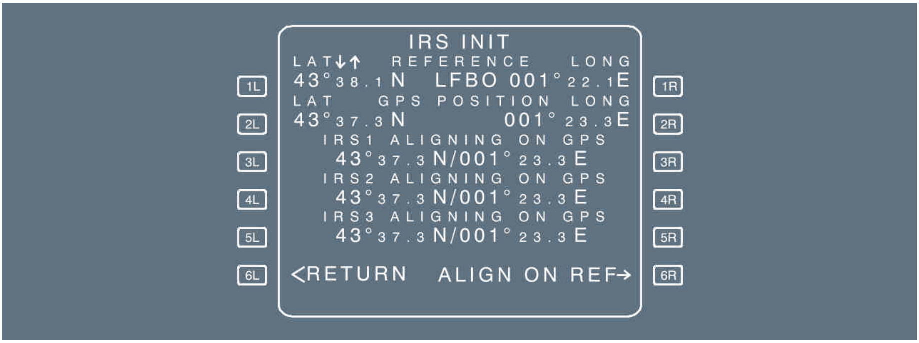
<RETURN

[2L] LAT	This field displays the latitude of the departure airport’s reference point. The pilot may modify it by slewing or overwriting.
[6L] RETURN	This prompt enables the pilot to return to the INIT A page.
[1R] ALIGN IRS	This field only displays this legend, if the LAT and LONG fields are filled in, and at least one of the inertial reference systems is in ALIGN status (IRS in NAV position and alignment process not over). If the pilot presses this key, when its field is displaying this legend, the present coordinates are sent to the IRSs and this completes the alignment process. If one of the three IRSs indicates an ALIGN FAULT occurence, the prompt becomes REALIGN IRS.
[2R] LONG	This field displays the longitude of the departure airport’s reference point. The pilot may modify it by slewing, or overwriting.

IRS INIT PAGE

Ident.: DSC-22_20-50-10-25-00006668.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The flight crew uses the IRS INIT page to align the inertial reference system. The flight crew accesses this page by pressing the IRS INIT key on the INIT A page.



```
          IRS INIT
LAT↓↑     REFERENCE      LONG
43°38.1N   LFBO 001°22.1E
LAT    GPS POSITION      LONG
43°37.3N           001°23.3E
    IRS1 ALIGNING ON GPS
    43°37.3N/001°23.3E
    IRS2 ALIGNING ON GPS
    43°37.3N/001°23.3E
    IRS3 ALIGNING ON GPS
    43°37.3N/001°23.3E
<RETURN      ALIGN ON REF→
```

Line 1 LAT-REFERENCE-LONG	This line provides the latitude and longitude of the FM reference position. This reference is extracted from the navigation database. The flight crew can modify this reference. Only when the FM reference position matches the origin airport position, the airport identifier is displayed in green. Otherwise, there are dashes at the place of the airport identifier. Latitude and longitude of the FM reference position are displayed in blue. The flight crew can modify the latitude and longitude values using the scroll keys.
Line 2 LAT-GPS POSITION-LONG	This line displays the GPS position latitude and longitude.
Line 3 to 5	These lines display the IRS 1-2-3 alignment state, source and latitude/longitude. The alignment status can be ALIGNING ON XXX, or ALIGNED ON XXX or IN ATT. XXX is the alignment source and can be GPS or CDU or REF. It is displayed in white font. The latitude and longitude values are displayed in green.
[6L] RETURN	This prompt enables the flight crew to return to the INIT A page.

[6R]	If a reference is available, the field displays ALIGN ON REF → in blue, which is replaced by CONFIRM ALIGN *, in amber when 6R prompt is pressed. Pressing again the 6R prompt enables the transmission of the FM reference position displayed in line 1.

WIND PAGES

Ident.: DSC-22_20-50-10-25-A-00006672.0001001 / 18 MAR 11
Applicable to: ALL

GENERAL

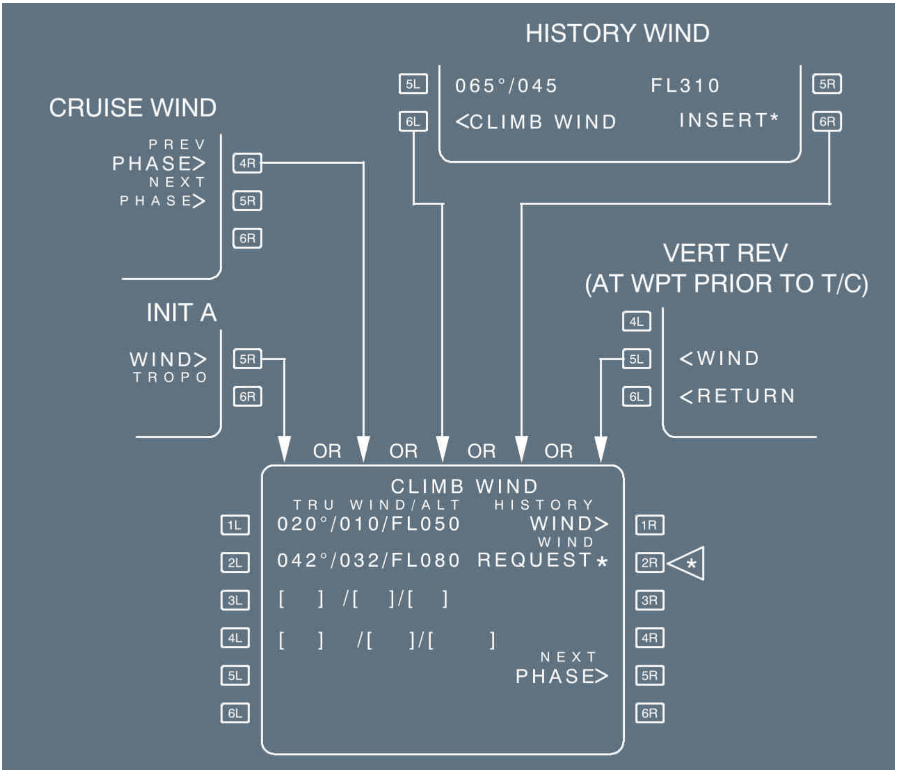
Winds in climb, cruise, descent and approach are necessary to provide the pilot with reliable predictions and performance. Wind pages enable the pilot to enter and/or review the winds propagated by the FMGES or sent by ACARS ◁ or ATSU ◁ for the various flight phases.

Note: On WIND pages, wind direction is always true referenced.

Ident.: DSC-22_20-50-10-25-A-00006677.0001001 / 01 MAR 18
Applicable to: ALL

CLIMB WIND PAGE

This page enables the pilot to enter and/or review predicted wind vectors (direction and velocity) at up to 5 different levels.
CLIMB WIND page is accessed from:

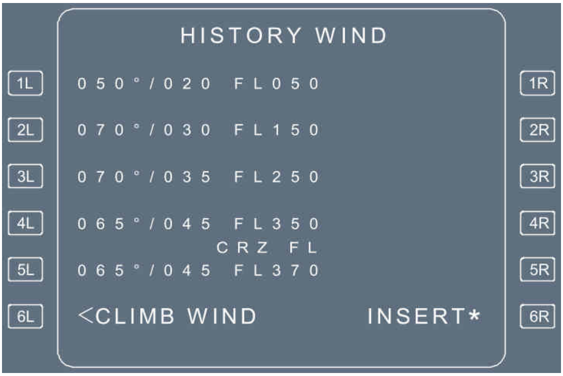

HISTORY WIND
5L
065°/045
FL310
5R
6L
<CLIMB WIND
INSERT*
6R
CRUISE WIND
PREV
PHASE>
4R
NEXT
PHASE>
5R
6R
VERT REV
(AT WPT PRIOR TO T/C)
4L
5L
<WIND
6L
<RETURN
INIT A
WIND>
TROPO
5R
6R
OR
OR
OR
OR
CLIMB WIND
TRU WIND/ALT
HISTORY
1L
020°/010/FL050
WIND>
1R
WIND
2L
042°/032/FL080
REQUEST*
2R
3L
[ ] /[ ]/[ ]
3R
4L
[ ] /[ ]/[ ]
4R
NEXT
5L
PHASE>
5R
6L
6R

TITLE	CLIMB WIND in white large font.
[1L] to [5L] TRU WIND/ALT	This field displays the winds entered at various climb altitudes in blue color before climb phase activation and in green color after climb phase activation. This field may also display history winds or uplink winds. Large blue brackets are displayed before any wind entry. Pilot entered and uplinked winds are displayed in large font, history wind data in small font. Upon sequencing the top of climb, the climb winds are deleted. *Note: Climb winds are not deleted when the origin airport is changed.*
[1R] HISTORY WIND	Displayed in preflight phase only. This key calls up the history wind page. This page is not modifiable (green small font) but can be inserted into the CLIMB WIND page using the 6R key and modified accordingly.

[2R] WIND REQUEST*	Pressing this key sends a request for ACARS winds. This prompt is active only on ACARS equipped aircraft.
[5R] NEXT PHASE	Pressing this key calls up the CRUISE WIND page or the DESCENT WIND page if no cruise waypoint exists.

Ident.: DSC-22_20-50-10-25-A-00006687.0001001 / 10 DEC 09
Applicable to: ALL

HISTORY WIND PAGE



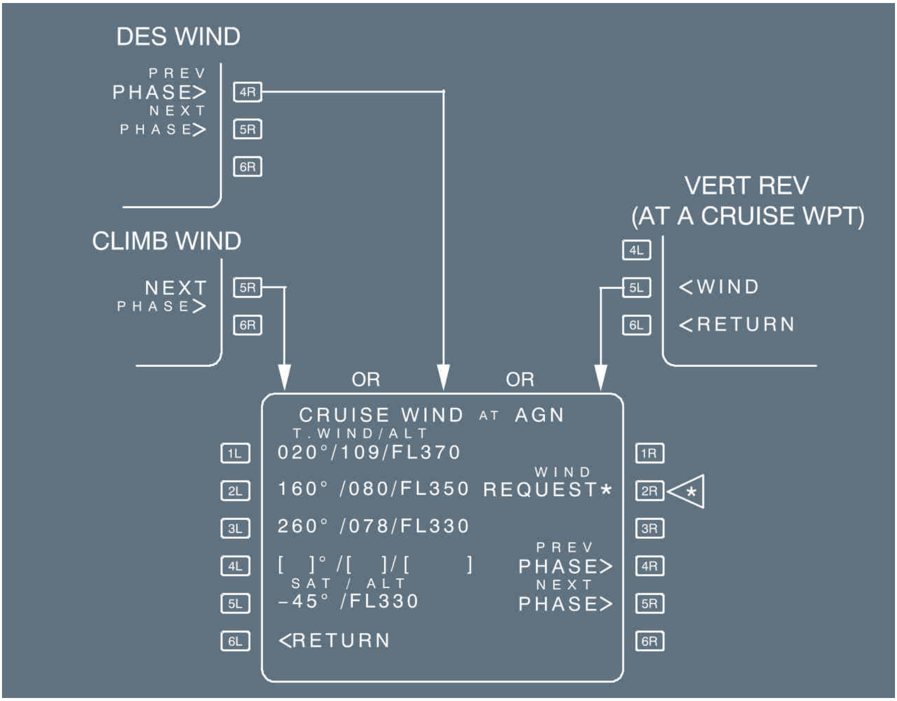
```
        HISTORY WIND
050°/020  FL050
070°/030  FL150
070°/035  FL250
065°/045  FL350
        CRZ FL
065°/045  FL370
<CLIMB WIND          INSERT*
```

[6L] CLIMB WIND	This key reverts the display to CLIMB WIND page.
[6R] INSERT	This key inserts the history wind values into the CLIMB WIND page.

Ident.: DSC-22_20-50-10-25-A-00006689.0001001 / 01 MAR 18
Applicable to: LV-GKO, LV-GKP

CRUISE WIND PAGE

This page displays the wind (direction and velocity) for each cruise waypoint. Cruise wind page is accessed as following. It allows to define a temperature at a given altitude.


DES WIND
PREV PHASE>
NEXT PHASE>
4R
5R
6R
CLIMB WIND
NEXT PHASE>
5R
6R
VERT REV
(AT A CRUISE WPT)
4L
5L
6L
<WIND
<RETURN
OR
OR
CRUISE WIND AT AGN
T.WIND/ALT
020°/109/FL370
160° /080/FL350
WIND REQUEST*
260° /078/FL330
[ ]° /[ ]/[ ]
PREV PHASE>
SAT / ALT
-45° /FL330
NEXT PHASE>
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
*

TITLE	CRUISE WIND AT in white large font.
[1L] T. WIND/ALT to [4L]	These fields display in blue the entered wind at various altitudes. The entered winds are propagated at the same altitude to the downpath cruise waypoints, if no other winds are entered. The propagated wind direction and velocity are displayed in small fonts. Both uplinked winds and pilot entered winds are displayed in blue large font. Wind data are modifiable during the cruise.
[5L] SAT/ALT	This field allows the pilot to enter a temperature at a given flight level, or displays a propagated value. The crew must enter both temperature and altitude at the first entry. He can then modify independantly the temperature or the altitude.
[2R] WIND REQUEST*	Pressing this key sends a request for ACARS winds.
[4R] PREV PHASE	This prompt is displayed in Preflight, Takeoff, Climb and Done phases. Pressing this prompt calls up the CLIMB WIND page.

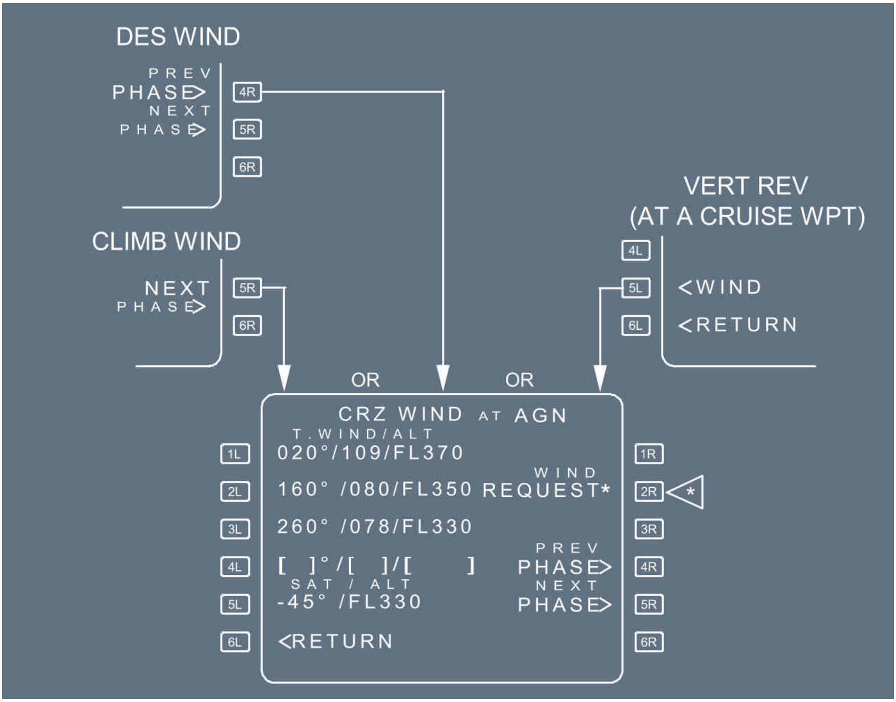
[5R] NEXT PHASE	Pressing this prompt calls up the DES WIND page. Any new entry performed on the CRUISE WIND page is immediately inserted into the corresponding flight plan. Predictions are dashed on the F-PLN pages during the recomputation time. CRUISE WIND page reverts automatically to F-PLN page if a temporary flight plan is created or the secondary flight plan is activated.

Ident.: DSC-22_20-50-10-25-A-00006689.0003001 / 01 MAR 18

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

CRZ WIND PAGE

This page displays the wind (direction and velocity) for each cruise waypoint. The CRZ Wind page enables the definition of a temperature at a given altitude, and is accessed as follows:


DES WIND
PREV PHASE>
NEXT PHASE>
4R
5R
6R
CLIMB WIND
NEXT PHASE>
5R
6R
VERT REV
(AT A CRUISE WPT)
4L
5L
6L
<WIND
<RETURN
OR
OR
CRZ WIND AT AGN
T.WIND/ALT
020°/109/FL370
WIND
160° /080/FL350 REQUEST*
260° /078/FL330
[ ]°/[ ]/[ ]
SAT / ALT
-45° /FL330
PREV PHASE>
NEXT PHASE>
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
*

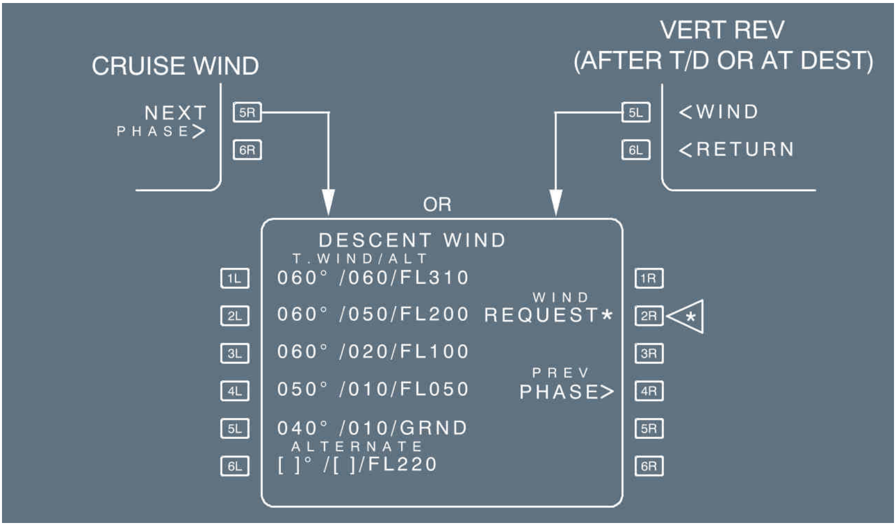
TITLE	CRZ WIND AT in white large font.

[1L] T. WIND/ALT to [4L]	These fields display in blue the entered wind at various altitudes. The entered winds are propagated at the same altitude to the downpath cruise waypoints, if no other winds are entered. The propagated wind direction and velocity are displayed in small fonts. Both uplinked winds and pilot entered winds are displayed in blue large font. Wind data are modifiable during the cruise.
[5L] SAT/ALT	This field allows the pilot to enter a temperature at a given flight level, or displays a propagated value. The crew must enter both temperature and altitude at the first entry. He can then modify independantly the temperature or the altitude.
[2R] WIND REQUEST*	Pressing this key sends a request for ACARS winds.
[4R] PREV PHASE	This prompt is displayed in Preflight, Takeoff, Climb and Done phases. Pressing this prompt calls up the CLIMB WIND page.
[5R] NEXT PHASE	Pressing this prompt calls up the DES WIND page. Any new entry performed on the CRZ WIND page is immediately inserted into the corresponding flight plan. Predictions are dashed on the F-PLN pages during the recomputation time. CRZ WIND page reverts automatically to F-PLN page if a temporary flight plan is created or the secondary flight plan is activated.

Ident.: DSC-22_20-50-10-25-A-00006693.0001001 / 01 MAR 18
Applicable to: ALL

DESCENT WIND PAGE

This page allows the pilot to define and display the winds used for computing the descent profile. The pilot calls it up by selecting NEXT PHASE on the CRUISE WIND page or WIND prompt on VERT REV page.



```
         DESCENT WIND
 T.WIND/ALT
060° /060/FL310
                       WIND
060° /050/FL200  REQUEST*
060° /020/FL100
                       PREV
050° /010/FL050    PHASE>
040° /010/GRND
 ALTERNATE
[ ]° /[ ]/FL220
```

[1L] to [5L]	This field displays inserted winds or uplinked winds in large blue font prior to activating the descent phase (modifiable values) and in green after descent phase activation (non-modifiable values). An entry of "GRND" in the "ALT" field is seen as the wind at ground level. This wind is copied on the PERF APPR page (and corrected for the magnetic variation). A clear action on one key reverts the line to blue bracket.
[6L] ALTERNATE	This field is displayed only when an alternate is defined. The pilot-entered value or uplinked value is displayed in large blue font. Always modifiable by the pilot.
[2R] WIND REQUEST*	Pressing this key sends a request for ACARS winds. This prompt is active only on ACARS <* or ATSU <* equipped aircraft.
[4R] PREV PHASE	Pressing this key calls up the CRUISE WIND page. The field is erased after the top of descent has sequenced.

Note: *Descent winds and alternate wind are deleted if the destination airport is changed.*

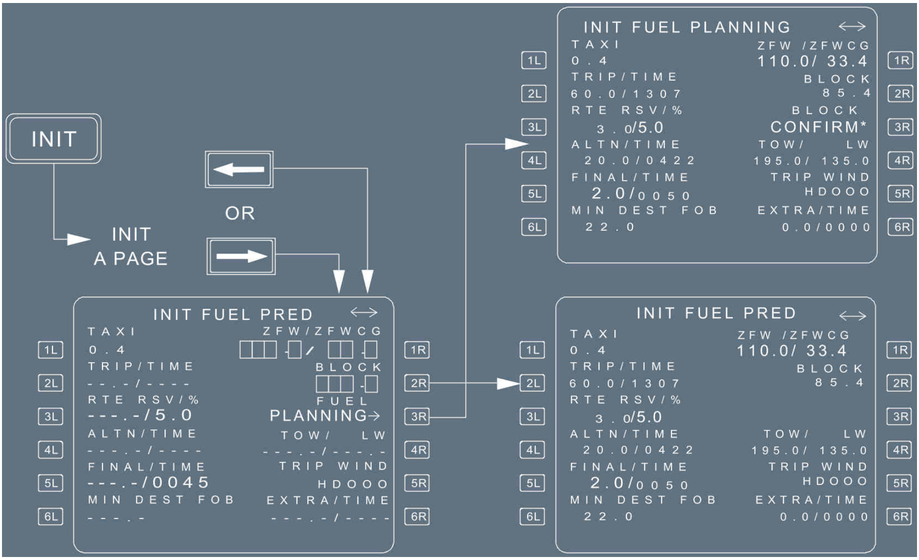
INIT FUEL PRED PAGE

Ident.: DSC-22_20-50-10-25-00006695.0005001 / 01 MAR 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

This page is used to initialize the Gross Weight and Center of Gravity values, before starting the engines.

As long as the engines have not been started, the flight crew can call up this page:
- from the INIT A page by pressing the "→" or "←" key on the MCDU, or
- by pressing the FUEL PRED key on the MCDU.

This page automatically reverts to the FUEL PRED page, after the first engine is started. The FMGEC will stop using the flight crew-entered block fuel and will compute its predictions based on the FOB indicated by the FCMC (or the FE as backup) from that moment on.


INIT
INIT
A PAGE
OR
INIT FUEL PLANNING ↔
TAXI
0.4
ZFW /ZFWCG
110.0/ 33.4
TRIP/TIME
60.0/1307
BLOCK
85.4
RTE RSV/%
3.0/5.0
BLOCK
CONFIRM*
ALTN/TIME
20.0/0422
TOW/ LW
195.0/ 135.0
FINAL/TIME
2.0/0050
TRIP WIND
HD000
MIN DEST FOB
22.0
EXTRA/TIME
0.0/0000
INIT FUEL PRED ↔
TAXI
0.4
ZFW/ZFWCG
□□□.□/□□.□
TRIP/TIME
---.-/----
BLOCK
□□□.□
RTE RSV/%
---.-/5.0
FUEL
PLANNING→
ALTN/TIME
---.-/----
TOW/ LW
---.-/---.-
FINAL/TIME
---.-/0045
TRIP WIND
HD000
MIN DEST FOB
---.-
EXTRA/TIME
---.-/----
INIT FUEL PRED ↔
TAXI
0.4
ZFW /ZFWCG
110.0/ 33.4
TRIP/TIME
60.0/1307
BLOCK
85.4
RTE RSV/%
3.0/5.0
ALTN/TIME
20.0/0422
TOW/ LW
195.0/ 135.0
FINAL/TIME
2.0/0050
TRIP WIND
HD000
MIN DEST FOB
22.0
EXTRA/TIME
0.0/0000
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] TAXI (blue)	This is the taxi fuel, that defaults to a preset value (usually 400 kg or 800 lb). The flight crew can change the value through this field.
[2L] TRIP/TIME (green)	This field displays the trip fuel and time when predictions are available. The flight crew cannot modify these values.
[3L] RTE RSV/% (blue)	This field displays the contingency fuel for the route and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The flight crew can either enter a fuel quantity, or a percentage.

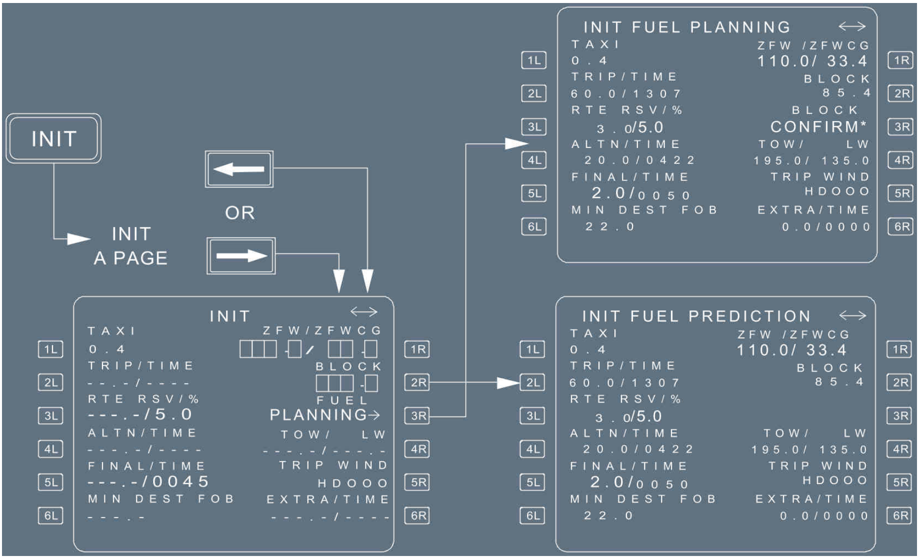
[4L] ALTN/TIME (blue/green)	This field displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.
[5L] FINAL/TIME (blue)	Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). Before any flight crew entry, the FINAL field is dashed and FINAL TIME field is defaulted to the value specified in the AMI file (typically 30 min). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF 1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
[6L] MIN DEST FOB (blue)	Displays the expected minimum fuel at destination. It is equal to the ALTN + FINAL fuel. This field can be modified by the flight crew, and is also impacted by the modification of ALTN and/or FINAL fuel. Note: *If flight crew entry of MIN DEST FOB is lower than ALTN + FINAL fuel, the message “CHECK MIN DEST FOB” is triggered on the MCDU.*
[1R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight CG (ZFWCG). The flight crew must enter the ZFW/ZFWCG values (as appropriate) to obtain a speed profile and predictions. Note: *If the flight crew enters a ZFW value that exceeds the acceptable range as defined in the performance data base, the “ENTRY OUT OF RANGE” message appears and the value is rejected.*
[2R] BLOCK	The block fuel in this field is a mandatory entry.
[3R] FUEL PLANNING (amber)	Pressing this key initiates an FMGEC block fuel computation using current hypothesis and extra = 0. When the flight crew selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGEC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGEC. If the flight crew modifies the parameters used for the prediction computation before confirmation, the computation restarts automatically and FUEL PLANNING is displayed in green.

[4R] TOW/LW (green)	Displays the computed Takeoff Weight (TOW) and Landing Weight (LW) at the primary destination. This cannot be modified.
[5R] TRIP WIND (blue)	This field allows the entry of a mean wind component for the trip from the origin to the destination. Upon entry of a CO RTE or FROM/TO pair, this field defaults to HD 000 in small font. An entry preceeded by –, H, HD is considered to be headwind, +, T, TL to be tailwind. The entered speed is displayed in large blue font. When the flight crew inserts a wind on the CLIMB, CRUISE or DESCENT WIND page or on the PERF APP page, the system no longer considers the trip wind, and the corresponding field is dashed.
[6R] EXTRA/TIME (green)	Displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + MIN DEST FOB). The field displays its information in small font, and it cannot be modified by the flight crew.

INIT B PAGE

Ident.: DSC-22_20-50-10-25-00006695.0004001 / 01 MAR 18
Applicable to: LV-KHT, LV-KHU

This page is used to initialize the Gross Weight and Center of Gravity values, before starting the engines.
The flight crew can call it up from the INIT A page, by pressing the “→” or “←” key on the MCDU, as long as the engines have not been started.
This page automatically reverts to the FUEL PRED page, after the first engine is started. The FMGEC will stop using the flight crew-entered block fuel and will compute its predictions based on the FOB indicated by the FCMC (or the FE as backup) from that moment on.


INIT
INIT
A PAGE
OR
INIT
TAXI
0.4
ZFW/ZFWCG
TRIP/TIME
--.-/----
BLOCK
RTE RSV/%
---.-/5.0
FUEL
PLANNING→
ALTN/TIME
---.-/----
TOW/ LW
---.-/----.-
FINAL/TIME
---.-/0045
TRIP WIND
HD000
MIN DEST FOB
---.-
EXTRA/TIME
---.-/----
INIT FUEL PLANNING
TAXI
0.4
ZFW /ZFWCG
110.0/ 33.4
TRIP/TIME
60.0/1307
BLOCK
85.4
RTE RSV/%
3.0/5.0
BLOCK
CONFIRM*
ALTN/TIME
20.0/0422
TOW/ LW
195.0/ 135.0
FINAL/TIME
2.0/0050
TRIP WIND
HD000
MIN DEST FOB
22.0
EXTRA/TIME
0.0/0000
INIT FUEL PREDICTION
TAXI
0.4
ZFW /ZFWCG
110.0/ 33.4
TRIP/TIME
60.0/1307
BLOCK
85.4
RTE RSV/%
3.0/5.0
ALTN/TIME
20.0/0422
TOW/ LW
195.0/ 135.0
FINAL/TIME
2.0/0050
TRIP WIND
HD000
MIN DEST FOB
22.0
EXTRA/TIME
0.0/0000
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] TAXI (blue)	This is the taxi fuel, that defaults to a preset value (usually 400 kg or 800 lb). The flight crew can change the value through this field.
[2L] TRIP/TIME (green)	This field displays the trip fuel and time when predictions are available. The flight crew cannot modify these values.
[3L] RTE RSV/% (blue)	This field displays the contingency fuel for the route and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The flight crew can either enter a fuel quantity, or a percentage.
[4L] ALTN/TIME (blue/green)	This field displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.

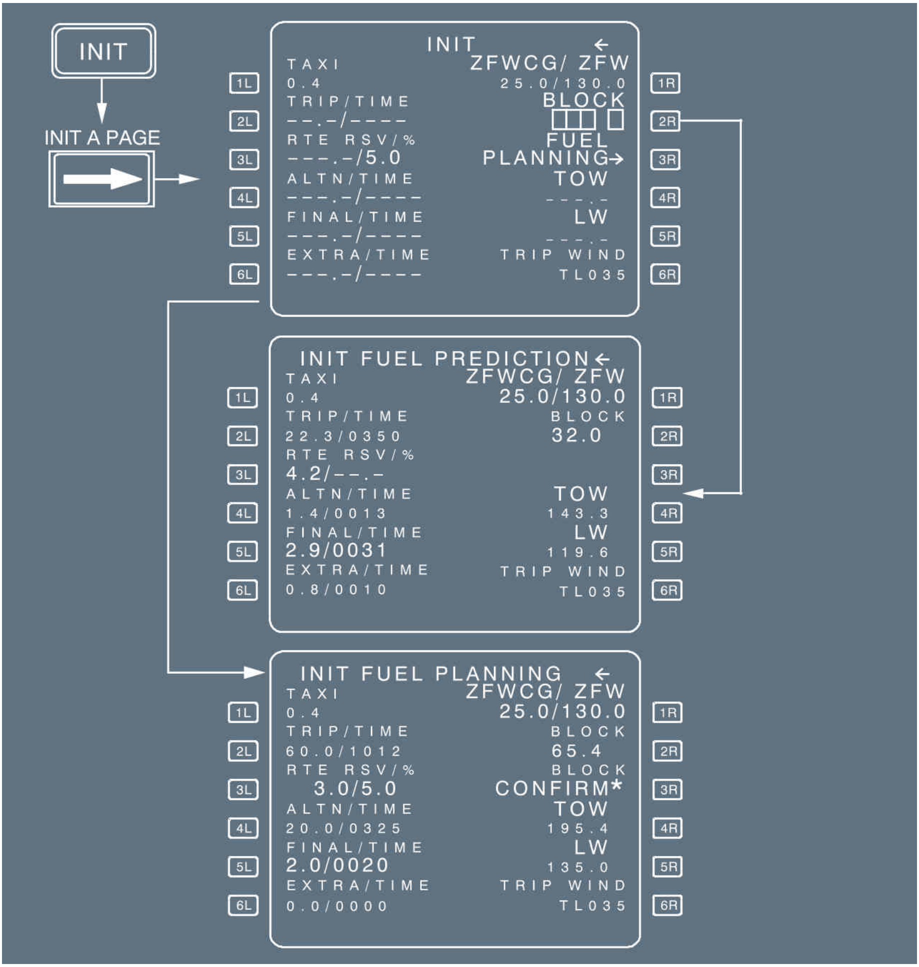
[5L] FINAL/TIME (blue)	Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). Before any flight crew entry, the FINAL field is dashed and FINAL TIME field is defaulted to the value specified in the AMI file (typically 30 min). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF 1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
[6L] MIN DEST FOB (blue)	Displays the expected minimum fuel at destination. It is equal to the ALTN + FINAL fuel. This field can be modified by the flight crew, and is also impacted by the modification of ALTN and/or FINAL fuel. *Note:* *If flight crew entry of MIN DEST FOB is lower than ALTN + FINAL fuel, the message “CHECK MIN DEST FOB” is triggered on the MCDU.*
[1R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight CG (ZFWCG). The flight crew must enter the ZFW/ZFWCG values (as appropriate) to obtain a speed profile and predictions. *Note:* *If the flight crew enters a ZFW value that exceeds the acceptable range as defined in the performance data base, the “ENTRY OUT OF RANGE” message appears and the value is rejected.*
[2R] BLOCK	The block fuel in this field is a mandatory entry. When the flight crew enters a block fuel, the title of the page changes to INIT FUEL PREDICTION.
[3R] FUEL PLANNING (amber)	Pressing this key initiates an FMGEC block fuel computation using current hypothesis and extra = 0. When the flight crew selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGEC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGEC. If the flight crew modifies the parameters used for the prediction computation before confirmation, the computation restarts automatically and FUEL PLANNING is displayed in green.
[4R] TOW/LW (green)	Displays the computed Takeoff Weight (TOW) and Landing Weight (LW) at the primary destination. This cannot be modified.

[5R] TRIP WIND (blue)	This field allows the entry of a mean wind component for the trip from the origin to the destination. Upon entry of a CO RTE or FROM/TO pair, this field defaults to HD 000 in small font. An entry preceeded by –, H, HD is considered to be headwind, +, T, TL to be tailwind. The entered speed is displayed in large blue font. When the flight crew inserts a wind on the CLIMB, CRUISE or DESCENT WIND page or on the PERF APP page, the system no longer considers the trip wind, and the corresponding field is dashed.
[6R] EXTRA/TIME (green)	Displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + MIN DEST FOB). The field displays its information in small font, and it cannot be modified by the flight crew.

INIT B PAGE

Ident.: DSC-22_20-50-10-25-00006695.0002001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

The pilot uses this page to initialize gross weight and center of gravity before starting the engines.
The pilot can call it up from the INIT A page, by pressing the [→] key on the MCDU console, as long as engines have not been started.
This page automatically reverts to the FUEL PRED page after the first engine is started. The FMGES computes its predictions, based on the FOB indicated by the FCMC (or FE as backup) from that moment on.


INIT
INIT A PAGE
INIT
TAXI
0.4
TRIP/TIME
--.-/----
RTE RSV/%
---.-/5.0
ALTN/TIME
---.-/----
FINAL/TIME
---.-/----
EXTRA/TIME
---.-/----
ZFWCG/ ZFW
25.0/130.0
BLOCK
FUEL PLANNING
TOW
---.-
LW
---.-
TRIP WIND
TL035
INIT FUEL PREDICTION
TAXI
0.4
TRIP/TIME
22.3/0350
RTE RSV/%
4.2/--.-
ALTN/TIME
1.4/0013
FINAL/TIME
2.9/0031
EXTRA/TIME
0.8/0010
ZFWCG/ ZFW
25.0/130.0
BLOCK
32.0
TOW
143.3
LW
119.6
TRIP WIND
TL035
INIT FUEL PLANNING
TAXI
0.4
TRIP/TIME
60.0/1012
RTE RSV/%
3.0/5.0
ALTN/TIME
20.0/0325
FINAL/TIME
2.0/0020
EXTRA/TIME
0.0/0000
ZFWCG/ ZFW
25.0/130.0
BLOCK
65.4
BLOCK
CONFIRM*
TOW
195.4
LW
135.0
TRIP WIND
TL035
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] TAXI	This is the taxi fuel, which defaults to a preset value, (usually 400 kg or 800 lb). The pilot can change the value through this field.
[2L] TRIP/TIME (green)	This field displays trip fuel and time when predictions become available. The pilot cannot modify this data.

[3L] RTE RSV/% (blue)	This field displays the reserve fuel for the route and the corresponding percentage of trip fuel. It may be blank, if such is the policy of the operator. The pilot can either enter a route reserve, or a percentage, and the system then automatically computes the nominal value.
[4L] ALTN/TIME (green)	This field displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. This field displays information in small font, and the flight crew cannot modify it.
[5L] FINAL/TIME	This field displays the hold fuel and time, associated with continued flight to the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the database). The pilot may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes that the holding will be in a racetrack pattern, 1 500 ft above the alternate airport, for 30 min, with the aircraft in CONF 1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the database).
[6L] EXTRA/TIME (green)	This field displays the amount of extra fuel, and the available time it represents for holding over to the alternate or primary destination, if the pilot did not define an alternate. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL). The field displays information in small font, and the flight crew cannot modify it.
[1R] ZFWCG/ZFW	The zero fuel weight and the location of the zero fuel weight CG are mandatory entries that allow the system to compute speed management and predictions. The pilot can modify this data.
[2R] BLOCK	The block fuel in this field is a mandatory entry that allows the system to predict the Estimated Fuel on Board (EFOB). When the pilot enters a block fuel, the title of the page changes to INIT FUEL PREDICTION. The FMGEC may also compute the block, if the pilot selects the FUEL PLANNING function.
[3R] FUEL PLANNING (amber)	Pressing this key initiates an FMGEC block fuel computation. When the pilot selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGEC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGEC. If the pilot modifies the parameters used for the prediction computation before confirmation, the computation restarts automatically and FUEL PLANNING is displayed in green.

Note: *If the pilot enters a number in field 1R or 2R that exceeds the limits, the field displays “ENTRY OUT OF RANGE” and does not accept the value.*

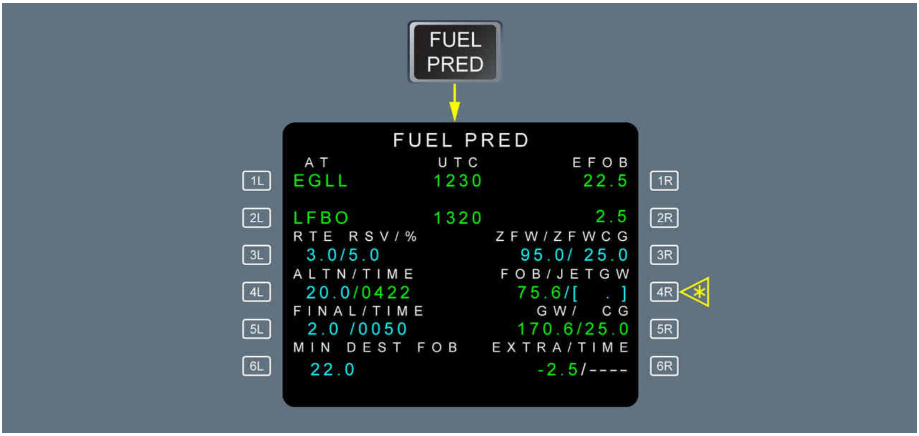
[4R] TOW (green)	This field displays the computed takeoff weight. The pilot cannot modify it (small font).
[5R] LW (green)	This field displays the computed landing weight at the primary destination. The pilot cannot modify it (small font).
[6R] TRIP WIND	This field allows the entry of a mean wind component for the trip from the primary origin to the primary destination. Upon entry of a CO RTE or FROM/TO pair, this field defaults to HD 000 in blue small font. An entry preceeded by –, H, HD is considered as headwind, +, T, TL as tailwind. The entered velocity is displayed in blue large font. As soon as the crew inserts a wind on the CLIMB, CRUISE or DESCENT WIND page, the SYSTEM no longer considers the trip wind.

FUEL PREDICTION PAGE

Ident.: DSC-22_20-50-10-25-00006719.0005001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The FUEL PRED page displays fuel prediction information at destination and alternate, as well as fuel management data after the engines are started. The flight crew accesses the FUEL PRED page, by pressing the FUEL PRED key on the MCDU. The flight crew may also select a final gross weight value for jettison operation.

Note: *After engine start, the flight crew can also call up this page by pressing the “→” key on the MCDU when on the INIT A page.*



```
           FUEL PRED
 AT            UTC          EFOB
EGLL          1230          22.5

LFBO          1320           2.5
RTE RSV/%             ZFW/ZFWCG
 3.0/5.0              95.0/ 25.0
ALTN/TIME              FOB/JETGW
 20.0/0422             75.6/[  . ]
FINAL/TIME                GW/ CG
 2.0 /0050            170.6/25.0
MIN DEST FOB         EXTRA/TIME
 22.0                  -2.5/----
```

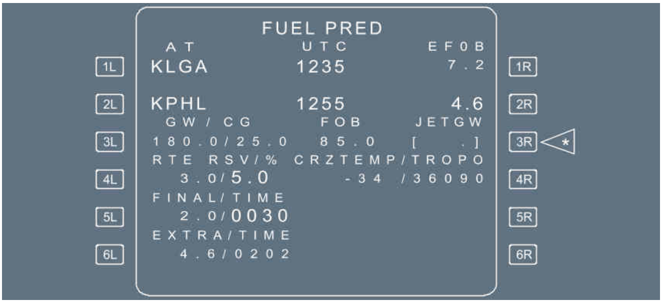
[1L] – [1R] AT/UTC–TIME/EFOB	Display time and fuel predictions to the primary destination. TIME is displayed before takeoff. UTC predictions are displayed after takeoff. If the flight crew has entered an ETT, the UTC is displayed. The EFOB at destination will turn to amber if it becomes less than the MIN DEST FOB value.
[2L] – [2R] AT/UTC–TIME/EFOB	These lines display time and fuel predictions to the alternate airport (*Refer to DSC-22_20-30-10-15 Alternate Function - Review and Selection of Alternate Airport*).
[3L] RTE RSV/%	Before departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The flight crew can either enter a fuel quantity or a percentage. After takeoff, 0.0/0.0 is displayed and the corresponding fuel is added to the extra fuel.
[4L] ALTN/TIME	Displays alternate trip fuel and time, assuming that the cost index is equal to 0 and that the aircraft flies at the default cruise flight level (*Refer to DSC-22_20-30-10-15 Alternate Function - Review and Selection of Alternate Airport*). The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.
[5L] FINAL/TIME	Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
[6L] MIN DEST FOB	Displays the expected Minimum Fuel at Destination. It is equal to the FINAL + ALTN fuel. The field can be modified directly by the flight crew, and is also impacted by the modification of the ALTN and/or the FINAL fuel.
[3R] ZFW/ZFWCG	Displays the ZFW and ZFWCG values, as entered before engine start on the INIT FUEL PRED page. The flight crew can re-enter or modify these values after engine start on the FUEL PRED page. If, at engine start, no ZFW or ZFWCG values have been entered, amber boxes are displayed in the corresponding field. The flight crew must enter the ZFW/ZFWCG values to obtain a speed profile and predictions.

[4R] FOB/JET GW ◁*	This field displays the FOB calculated by the FCMC (or FE as backup). This field cannot be modified. The flight crew enters the jettison final gross weight in this field. The FCMC uses this value to stop jettison, when activated.
[5R] GW/CG	The FMS continuously updates the GW and CG during the flight. The field displays dashes, as long as the system is not calculating the FOB, or ZFW has not been entered by the flight crew. The field cannot be modified.
[6R] EXTRA/TIME	Displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = FOB – (TAXI + TRIP + RSV + MIN DEST FOB). This field displays its information in small green font, and it cannot be modified by the flight crew.

FUEL PREDICTION PAGE

Ident.: DSC-22_20-50-10-25-00006719.0002001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

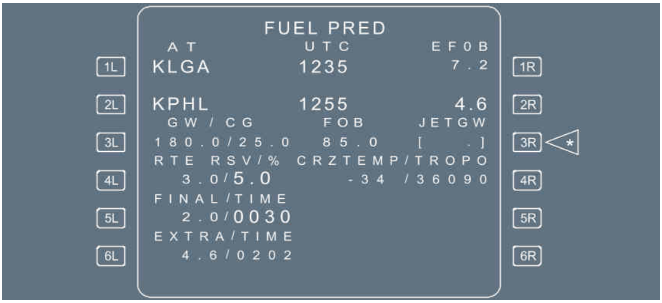
The pilot presses the FUEL PRED key on the MCDU console to display fuel prediction information at destination (DEST) and alternate (ALTN), as well as fuel management data after the engines are started. The pilot may also select a final Gross Weight value for jettison operation.



```
              FUEL PRED
  AT           UTC            EFOB
KLGA          1235             7.2

KPHL          1255             4.6
  GW/CG         FOB         JETGW
180.0/25.0     85.0      [     .]
RTE RSV/%   CRZTEMP/TROPO
   3.0/5.0           -34  /36090
FINAL/TIME
   2.0/0030
EXTRA/TIME
   4.6/0202
```

Line 1 AT-UTC/TIME-EFOB	These fields display predictions of time and fuel to the primary destination. TIME is displayed before takeoff, UTC predictions after takeoff. After the pilot enters an Estimated Takeoff Time (ETT), the UTC is displayed.
Line 2 AT-UTC/TIME-EFOB	These fields display predictions of time and fuel to the alternate airport. (*Refer to DSC/22_20 Auto Flight - Flight Management / 30 Flight Planning / 10 Lateral Fonctions / Alternate Fonction* for details).

[3L] GW/CG	GW The system continually updates gross weight during the flight. If no zero fuel weight has been entered, the screen displays amber boxes next to this key. The pilot must enter information in these boxes in order to obtain a speed profile, speed computations, and predictions. The field displays dashes, as long as the system is not calculating fuel on board. CG The system continually updates the center of gravity location along the flight path. If no center of gravity has been entered, the screen displays amber boxes next to this key. The pilot must enter information in these boxes in order to obtain a speed profile, speed computations and predictions. The pilot can modify both the GW and CG.
Line 3 FOB	This field displays the fuel on board, computed by the FCMC (or FE as backup). The flight crew cannot modify this number.
[4L] RTE RSV/%	Prior to departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. After takeoff, it displays the percentage of the remaining trip fuel from the present position to the destination. The field may be blank, depending on the fuel policy of the operating airline. The crew can enter either a RTE RSV or a RTE RSV %. The system automatically computes the other value.


```
              FUEL PRED
  AT             UTC            EF0B
KLGA             1235            7.2

KPHL             1255            4.6
  GW/CG            FOB         JETGW
180.0/25.0       85.0        [    .]
RTE RSV/%  CRZTEMP/TROPO
   3.0/5.0             -34  /36090
FINAL/TIME
   2.0/0030
EXTRA/TIME
   4.6/0202
```

[5L] FINAL/TIME	This field displays the hold fuel and time, associated with continued flight to the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the database). The pilot may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes that the holding will be in a racetrack pattern, 1 500 ft above the alternate airport, for 30 min, with the aircraft in CONF1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the database).
[6L] EXTRA/TIME	This field displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL) The pilot cannot modify this field (displayed in small green font).
[3R] JET GW ◁*	When the FMS Fuel Jettison option is activated, the flight crew can enter the jettison final gross weight in this field. The FCMC uses this value to stop jettison.
[4R] CRZ TEMP/TROPO	This field displays the temperature at the cruise flight level and the altitude of the tropopause. The tropopause defaults to 36 090 ft. The pilot can modify both values. The field is dashed, when the aircraft sequences the top of climb.

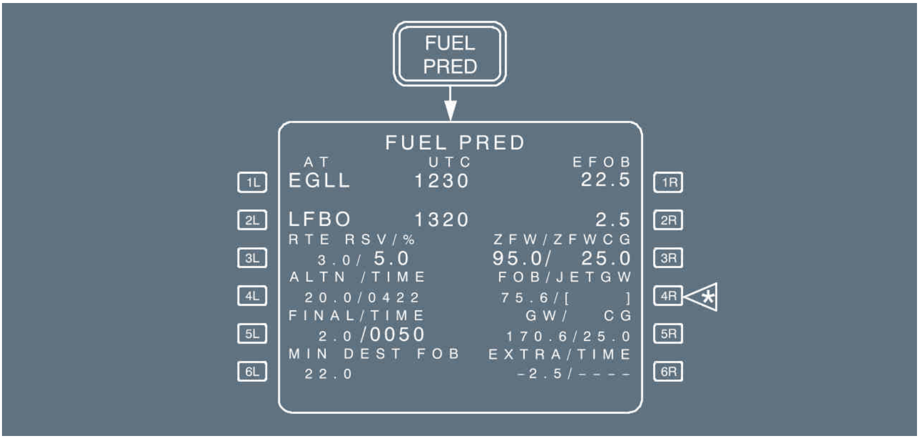
Note: *All fields, except [3R], [4R], [5R] and [6R], show dashes until the flight crew starts an engine.*

FUEL PREDICTION PAGE

Ident.: DSC-22_20-50-10-25-00006719.0004001 / 17 JUN 14
Applicable to: LV-KHT, LV-KHU

The FUEL PRED page displays fuel prediction information at destination and alternate, as well as fuel management data after the engines are started. The flight crew accesses the FUEL PRED page, by pressing the FUEL PRED key on the MCDU. The flight crew may also select a final Gross Weight value for jettison operation.

Note: *The flight crew can also call up this page by pressing the “→” key on the MCDU when on the INIT A page.*



```
           FUEL PRED
 AT          UTC          EFOB
EGLL         1230         22.5

LFBO         1320          2.5
RTE RSV/%             ZFW/ZFWCG
  3.0/ 5.0            95.0/ 25.0
ALTN /TIME             FOB/JETGW
  20.0/0422            75.6/[  ]
FINAL/TIME               GW/  CG
  2.0/0050          170.6/25.0
MIN DEST FOB        EXTRA/TIME
  22.0                -2.5/----
```

[1L] – [1R] AT/UTC–TIME/EFOB (green)	Display time and fuel predictions to the primary destination. TIME is displayed before takeoff. UTC predictions are displayed after takeoff. If the flight crew has entered an Estimated Takeoff Time (ETT), the UTC is displayed. The EFOB at destination will turn to amber if it becomes less than the MIN DEST FOB value.
[2L] – [2R] AT/UTC–TIME/EFOB	These lines display time and fuel predictions to the alternate airport. (*Refer to DSC-22_20-30-10-15 Alternate Function - Review and Selection of Alternate Airport*).
[3L] RTE RSV/% (blue)	Before departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. It may be equal to 0.0, if such is the policy of the operator. The flight crew can either enter a fuel quantity or a percentage. After takeoff, it becomes green 0.0/0.0 and the corresponding fuel is added to the EXTRA fuel.
[4L] ALTN/TIME (blue/green)	Displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. (*Refer to DSC-22_20-30-10-15 Alternate Function - Review and Selection of Alternate Airport*). The flight crew can modify the alternate fuel as required. In this case, alternate time will be dashed.

[5L] FINAL/TIME (blue)	Displays the final reserve fuel and time calculated at the alternate airport (or destination airport, if selected in the “airline fuel policy” section of the AMI). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes a holding pattern at 1 500 ft AGL, with the aircraft in CONF1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the “airline fuel policy” section of the AMI).
[6L] MIN DEST FOB (blue)	Displays the expected Minimum Fuel at Destination. It is equal to the FINAL + ALTN fuel. The field can be modified directly by the flight crew, and is also impacted by the modification of the ALTN and/or the FINAL fuel.
[3R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values, as entered before engine start on the INIT B page. The flight crew can re-enter or modify these values after engine start on the FUEL PRED page. If, at engine start, no ZFW or ZFWCG values have been entered, amber boxes are displayed in the corresponding field. The flight crew must enter the ZFW/ZFWCG values to obtain a speed profile and predictions.
[4R] FOB (green) / JET GW ◁	This field displays the Fuel On Board calculated by the FCMC (or FE as backup). This field cannot be modified. The flight crew enters the jettison final gross weight in this field. The FCMC uses this value to stop jettison, when activated.
[5R] GW/CG (green)	The FMS continuously updates the Gross Weight (GW) and Center of Gravity (CG) during the flight. The field displays dashes, as long as the system is not calculating the Fuel On Board, or ZFW has not been entered by the flight crew. The field cannot be modified.
[6R] EXTRA/TIME (green)	Displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = FOB – (TAXI + TRIP + RSV + MIN DEST FOB). This field displays its information in small green font, and it cannot be modified by the flight crew.

Note: *All fields are dashed before engines are started.*

FLIGHT PLAN PAGES

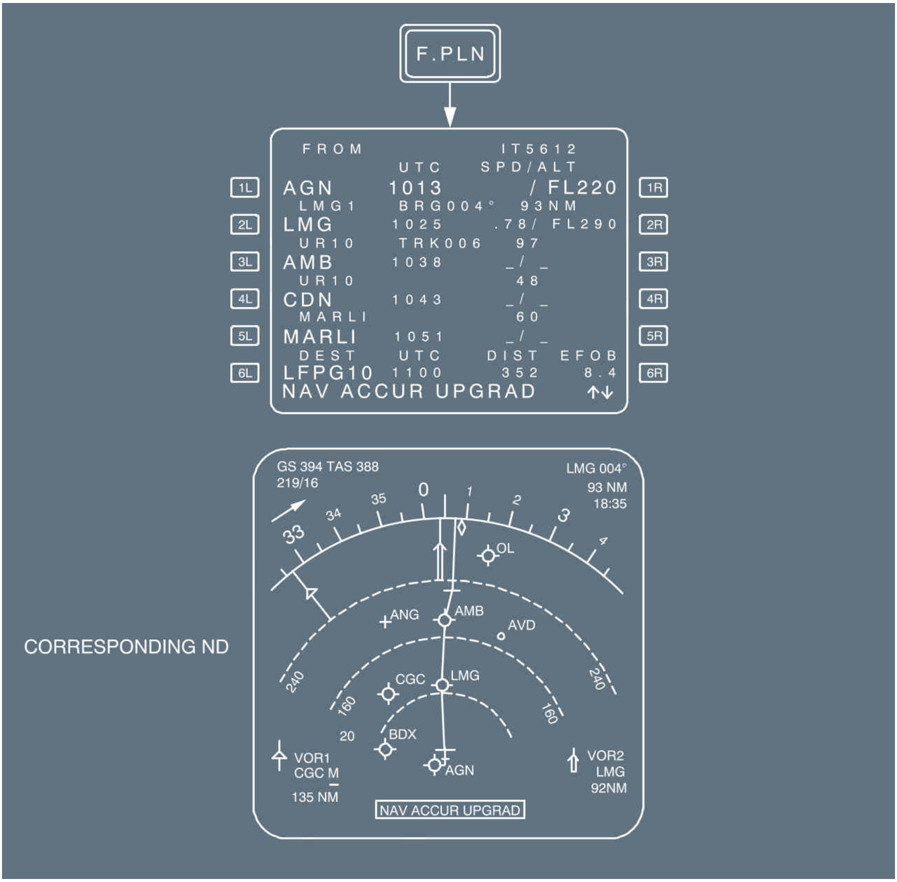
Ident.: DSC-22_20-50-10-25-B-00006733.0001001 / 16 MAR 11
Applicable to: ALL

These pages display all waypoints of the active and alternate flight plans, along with associated predictions.
The pilot can make all revisions to the lateral and vertical flight plans through these pages. He presses the left key to revise the lateral flight plan and the right key to revise the vertical flight plan.
He presses the F-PLN key on the MCDU console to gain access to the A page of the active flight plan.

Ident.: DSC-22_20-50-10-25-B-00006745.0001001 / 19 DEC 12
Applicable to: LV-GKO, LV-GKP

FLIGHT PLAN A PAGE

The A page displays time, speed, and altitude predictions for each waypoint of the active flight plan.



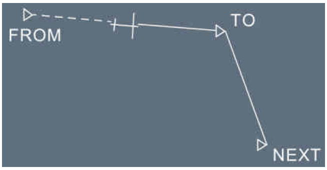
```
 FROM                    IT5612
            UTC     SPD/ALT
AGN         1013       / FL220
 LMG1       BRG004°   93NM
LMG         1025     .78/ FL290
 UR10       TRK006    97
AMB         1038       _/ _
 UR10                 48
CDN         1043       _/ _
 MARLI                60
MARLI       1051       _/ _
 DEST       UTC     DIST   EFOB
LFPG10      1100     352    8.4
NAV ACCUR UPGRAD             ↑↓
```

F.PLN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CORRESPONDING ND
GS 394 TAS 388
219/16
LMG 004°
93 NM
18:35
33
34
35
0
1
2
3
4
OL
ANG
AMB
AVD
240
240
CGC
LMG
160
160
20
BDX
AGN
VOR1
CGC M
135 NM
VOR2
LMG
92NM
NAV ACCUR UPGRAD

TITLE	FLIGHT NUMBER (blank if no flight number has been entered) This line may display yellow TMPY if a temporary flight plan exists, white OFST, if a lateral offset is flown or yellow OFST if a lateral offset revision is pending.
Line 1 to 5 WPT, UTC, SPD/ALT	These lines display consecutive waypoints along with associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff and UTC after takeoff. After the pilot enters an estimated takeoff time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.

[1R] SPD ALT	The field dedicated to SPEED or MACH is blank at the FROM waypoint except at airport of departure. (V1 is displayed associated with runway elevation).
Line 6 DEST, UTC/TIME, DIST, EFOB	DIST is the distance to the destination along the displayed flight plan. EFOB is the estimated fuel on board at the destination. The sixth line is permanent and is displayed in a white font once predictions are available, except when a TMPY F-PLN is displayed or when an ALT CSTR is entered (* CLB or DES*) prompt appears).

Note: The predicted altitude at a waypoint is related to the QNH below the transition altitude and is given as a flight level above the transition altitude.



The generic flight plan page displays the FROM waypoint (last waypoint to be overflown) on the first line and the TO waypoint in white on the second line. The FROM/TO flight plan leg is called the active leg.
The flight crew can use the scrolling keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast slew key ; the pilot can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page.
In order to return to the beginning of the flight plan page, the pilot presses the F-PLN key on the MCDU console.
The display shows the name of the leg between two waypoints and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, “2-3 °” indicates that the leg is two nautical miles long, and the flight path angle is –3 °.
The display shows the bearing between FROM and TO waypoints as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3. This is the outbound track of the next leg.
When TRUE is selected or when entering the polar area, the degree symbol is replaced by “T”.
If the data base contains a published missed-approach procedure, or if someone has inserted one manually, the display shows it in blue after the destination runway identification. It turns green when the go-around phase becomes active.
After the last waypoint of the missed approach, the display shows the alternate flight plan in NAV mode.

When airborne, the flight crew can clear or modify the TO waypoint only by using the DIR key on the MCDU console.

PREDICTIONS

The system calculates and displays predictions for all waypoints.

CONSTRAINTS

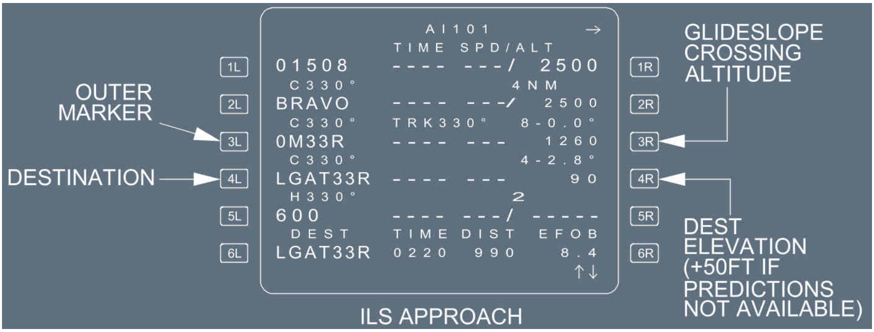
The database may define an altitude constraint and speed constraint for each waypoint of the climb, descent, and approach phases, or the pilot may insert such constraints manually. (Except at origin, destination, FROM and pseudo waypoints).
The constraints are displayed in magenta as long as predictions are not completed.
Once predictions are available, constraints are replaced by speed and altitude predictions preceded by stars. If the star is magenta the system is predicting that the aircraft will match the constraint (altitude within 250 ft, speed not more than 10 kt above the constraints). If the star is amber, the system is predicting that the aircraft will miss the constraint and the MCDU displays “SPD ERROR AT WPT” message.

PSEUDO WAYPOINTS

Pseudo waypoints are computed geographical positions corresponding to an event in the vertical flight plan ; T/C (top of climb), T/D (top of descent), SPD/LIM (speed limit), DECEL (deceleration for approach) etc. The display shows them as waypoints in parentheses.

APPROACH DISPLAY

The flight crew cannot enter an altitude constraint at the destination or MAP (Missed Appraoch Point).



```
            AI101            →
        TIME  SPD/ALT
01508   ----  ---/  2500
 C330°              4NM
BRAVO   ----  ---/  2500
 C330°  TRK330°   8-0.0°
0M33R   ----  ---   1260
 C330°            4-2.8°
LGAT33R ----  ---     90
 H330°             2
600     ----  ---/ -----
 DEST   TIME  DIST  EFOB
LGAT33R 0220   990   8.4
                      ↑↓
```

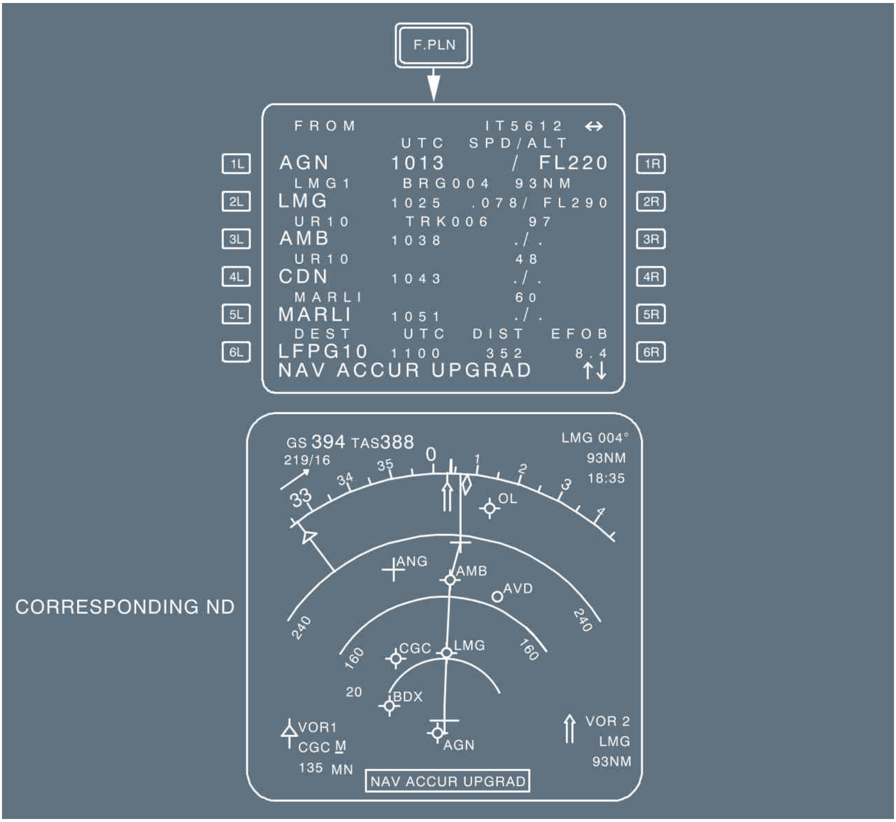
OUTER MARKER
DESTINATION
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GLIDESLOPE CROSSING ALTITUDE
DEST ELEVATION (+50FT IF PREDICTIONS NOT AVAILABLE)

ILS APPROACH

Ident.: DSC-22_20-50-10-25-B-00006745.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FLIGHT PLAN A PAGE

Page A displays time, speed, and altitude predictions for each active flight plan waypoint.



```
 FROM                  IT5612 ↔
          UTC   SPD/ALT
AGN       1013        / FL220
 LMG1       BRG004   93NM
LMG       1025    .078/ FL290
 UR10       TRK006     97
AMB       1038        ./.
 UR10                  48
CDN       1043        ./.
 MARLI                 60
MARLI     1051        ./.
 DEST     UTC    DIST    EFOB
LFPG10    1100    352     8.4
NAV ACCUR UPGRAD           ↑↓
```

F.PLN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CORRESPONDING ND
GS 394 TAS388
219/16
LMG 004°
93NM
18:35
33
34
35
0
1
2
3
4
OL
ANG
AMB
AVD
240
240
CGC
LMG
160
160
20
BDX
AGN
VOR1
CGC M
135 MN
VOR 2
LMG
93NM
NAV ACCUR UPGRAD

TITLE	FLIGHT NUMBER (blank, if no flight number has been entered). This line may display OFST in white, if a lateral offset is flown. It may display yellow TMPY if a temporary flight plan exists.

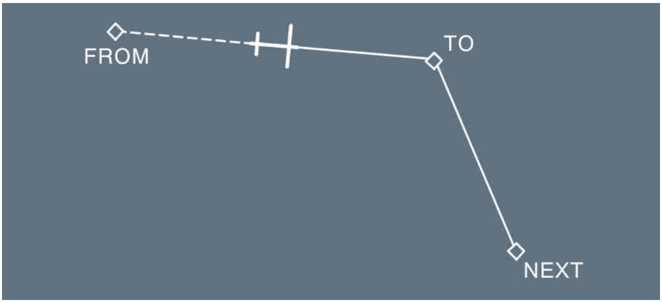
Line 1 to Line 5 WPT, UTC, SPD, ALT	These lines display consecutive waypoints, along with associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff, and UTC after takeoff. After the pilot enters an Estimated Takeoff Time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.
[1R] SPD/ALT	The field dedicated to SPEED or MACH is blank at the FROM waypoint, except at the departure airport. (V1 associated with runway elevation, is displayed).

Note: *When the aircraft approaches a holding pattern the IMM EXIT or RESUME HOLD prompt will replace the SPD/ALT field.*

Note: *The predicted altitude at a waypoint is related to the QNH below the transition altitude, and is given as a flight level above the transition altitude.*

Line 6, DEST UTC/TIME DIST, EFOB	DIST is the distance to destination along the displayed flight plan. EFOB is the Estimated Fuel on Board at destination. The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value. The sixth line is permanent and is displayed in white font, once predictions are available, except when a TMPY F-PLN is displayed, or in some cases when an ALT CSTR is entered ("← CLB or DES →" prompt appears).

The generic flight plan page displays the FROM waypoint (last waypoint overflown) on the first line, and the TO waypoint (in white) on the second line. The FROM/TO flight plan leg is called the active leg.



The flight crew can use the scroll keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast scroll key. The pilot can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page.

In order to return to the beginning of the flight plan page, the pilot presses the F-PLN key on the MCDU console.
The display shows the name of the leg between two waypoints, and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, “2-3 °” indicates that the leg is 2 NM long, and the flight path angle is -3 °.
The display shows the bearing between FROM and TO waypoints as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3. This is the outbound track of the next leg.
When TRUE is selected or when entering the polar area, the degree symbol is replaced by “T”.
If the database contains a published missed approach procedure, or if one has been inserted manually, the display shows it in blue after the destination runway identification. It turns green when the Go-around phase becomes active.
After the last waypoint of the missed approach, the display shows the alternate flight plan.
When NAV mode is engaged, the flight crew can only clear or modify the TO waypoint by using the DIR key on the MCDU console.

PREDICTIONS

The FMS calculates and displays predictions at all F-PLN waypoints.
It uses the current wind and the predicted winds to compute the predictions.

CONSTRAINTS

The database can define an altitude constraint and speed constraint for each waypoint of the climb, descent, and approach phases, or the pilot can manually insert such constraints (except at origin, destination, FROM, and pseudo-waypoints).
The constraints are displayed in magenta, until the predictions are completed.
When the predictions are available, the constraints are replaced by speed and altitude predictions preceded by stars. If the star is in magenta, the system predicts that the aircraft will match the constraint (altitude within 250 ft, speed not more than 10 kt above the constraints). If the star is in amber, the system predicts that the aircraft will miss the constraint, and the MCDU displays “SPD ERROR AT WPT”.

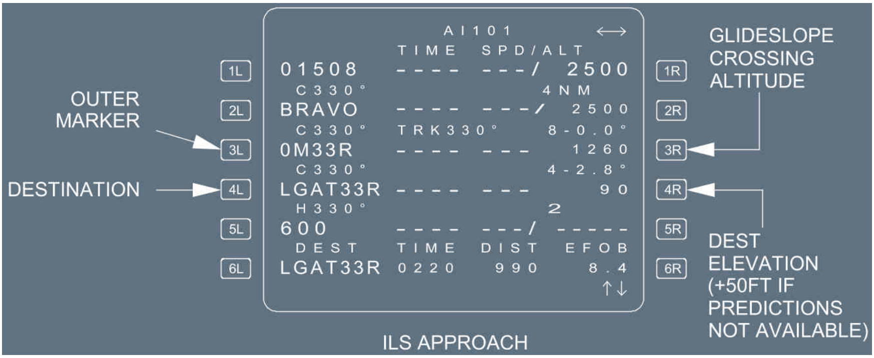
Note: *SPD and ALT CSTR can either be entered from the VERT REV page, or directly on the F-PLN A page. Time constraints can only be entered on the RTA page.*

PSEUDO WAYPOINTS

Pseudo-waypoints are geographical positions corresponding to an event in the flight plan: T/C (Top of Climb), T/D (Top of Descent), SPD/LIM (Speed Limit), S/C (Step Climb point), S/D (Step Descent point), DECEL (Deceleration for Approach), Time Markers etc. Pseudo-waypoints are displayed as waypoints in parentheses.

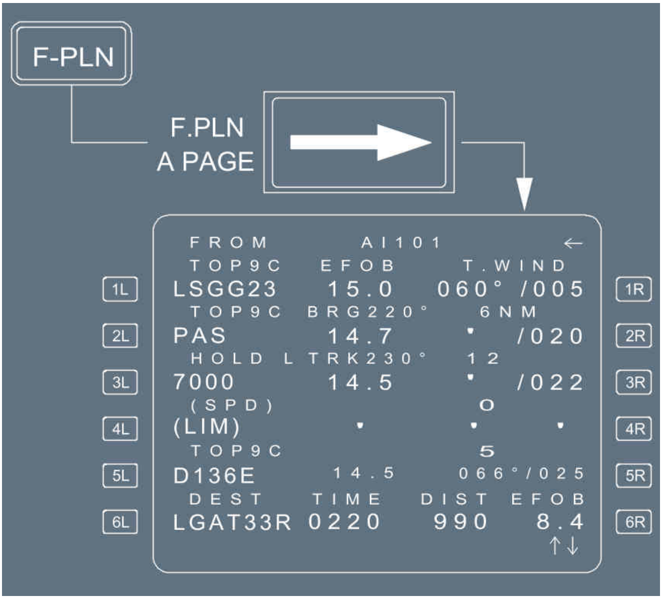
APPROACH DISPLAY

The flight crew cannot enter an altitude constraint at the destination or MAP (Missed Approach Point).


AI101 ↔
TIME SPD/ALT
1L 01508 ---- ---/ 2500 1R
C330° 4NM
2L BRAVO ---- ---/ 2500 2R
C330° TRK330° 8-0.0°
3L 0M33R ---- --- 1260 3R
C330° 4-2.8°
4L LGAT33R ---- --- 90 4R
H330° 2
5L 600 ---- ---/ ----- 5R
DEST TIME DIST EFOB
6L LGAT33R 0220 990 8.4 6R
↑↓
OUTER MARKER
DESTINATION
GLIDESLOPE CROSSING ALTITUDE
DEST ELEVATION (+50FT IF PREDICTIONS NOT AVAILABLE)
ILS APPROACH

Ident.: DSC-22_20-50-10-25-B-00006754.0001001 / 16 MAR 11
Applicable to: ALL

This page displays fuel predictions and forecast winds at each waypoint.
The pilot calls it up by pressing the next page key when the display is showing the A page.



```
 FROM        AI101            ←
 TOP9C     EFOB       T.WIND
LSGG23     15.0     060°/005
 TOP9C   BRG220°      6NM
PAS        14.7       "  /020
 HOLD L TRK230°     12
7000       14.5       "  /022
 (SPD)                O
(LIM)         "       "     "
 TOP9C                5
D136E      14.5     066°/025
 DEST    TIME    DIST   EFOB
LGAT33R  0220    990    8.4
                          ↑↓
```

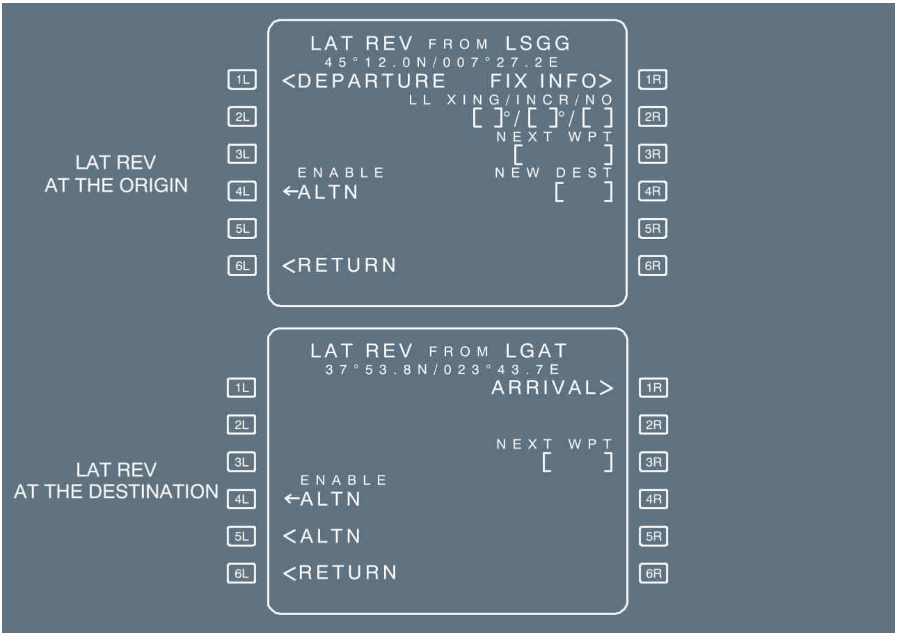
TITLE	FLIGHT NUMBER (blank if no flight number has been entered)
Line 1 to Line 5 WPT-EFOB-WIND	These lines display consecutive waypoints and associated fuel predictions, and the forecast wind profile. The direction of forecast winds is relative to true north. Forecast winds include winds entered by the pilot (large font) and the propagated winds at intermediate waypoints (small font). If the flight crew uses a trip wind, it will be displayed for each waypoint. If no other wind entry is made after takeoff, the FROM waypoint will display the wind actually recorded, and the waypoints downpath will still display the trip wind.
Line 6 DEST-UTC/DIST-EFOB	Identical to F-PLN A page.

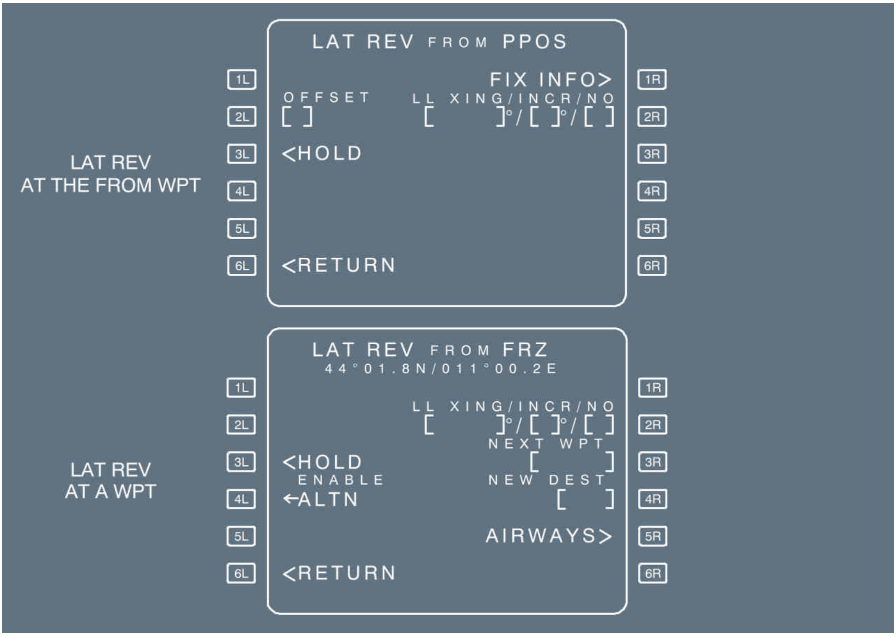
LATERAL REVISION PAGES

Ident.: DSC-22_20-50-10-25-C-00006766.0001001 / 03 NOV 21
Applicable to: LV-GKO, LV-GKP

GENERAL

These pages give the flight crew a list of the lateral flight plan revisions that can use to change the flight plan beyond a selected waypoint.
The flight crew calls up these pages from the flight plan pages (A or B) by pressing the left key adjacent to the selected waypoint.
Different lateral flight plan revisions are available for different waypoints.


LAT REV
AT THE ORIGIN
LAT REV FROM LSGG
45°12.0N/007°27.2E
<DEPARTURE
FIX INFO>
LL XING/INCR/NO
[ ]°/[ ]°/[ ]
NEXT WPT
[ ]
ENABLE
←ALTN
NEW DEST
[ ]
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LAT REV
AT THE DESTINATION
LAT REV FROM LGAT
37°53.8N/023°43.7E
ARRIVAL>
NEXT WPT
[ ]
ENABLE
←ALTN
<ALTN
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R


LAT REV AT THE FROM WPT
LAT REV FROM PPOS
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO>
OFFSET
[ ]
LL XING/INCR/NO
[ ]°/[ ]°/[ ]
<HOLD
<RETURN
LAT REV AT A WPT
LAT REV FROM FRZ
44°01.8N/011°00.2E
LL XING/INCR/NO
[ ]°/[ ]°/[ ]
NEXT WPT
<HOLD
[ ]
ENABLE
NEW DEST
←ALTN
[ ]
AIRWAYS>
<RETURN

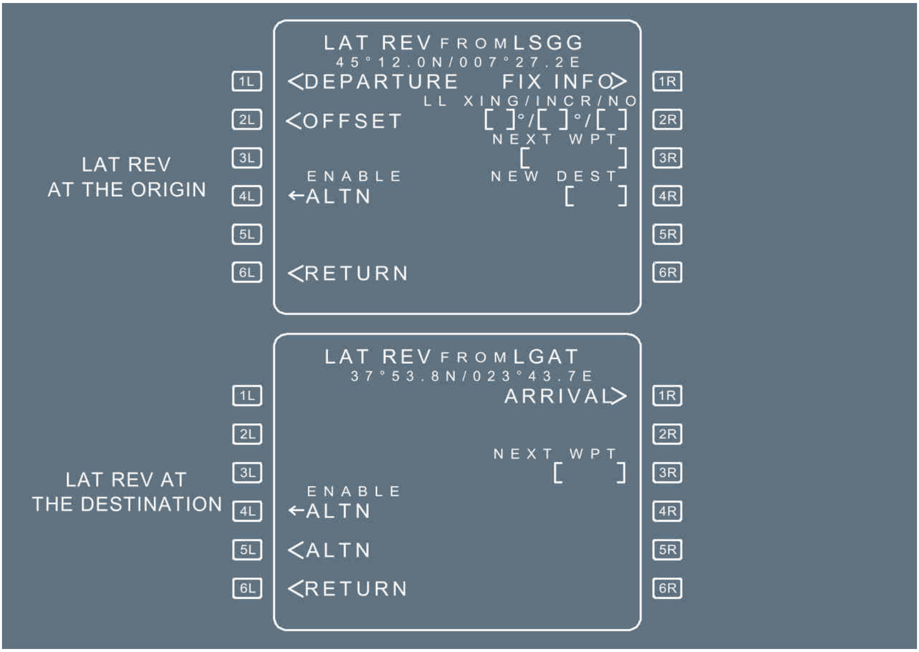
TITLE	The ident of the waypoint or airport selected for revision, along with its latitude and longitude. If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and displays PPOS (present position) instead.
[1L] DEPARTURE	This prompt gives the flight crew access to the departure pages, where the flight crew can select runways, SIDs, and TRANSs and insert them.
[2L] OFFSET [ ]	This prompt allows the flight crew to enter a lateral offset, left or right, in the flight plan. The offset may be from 1to 50 NM. When the flight crew enters an offset, the OFFSET field becomes yellow and the 6L and 6R fields display ERASE and INSERT. The flight crew can delete an inserted offset by pressing the CLR pushbutton, by entering a zero for the amount of the offset, or by selecting a DIR TO.

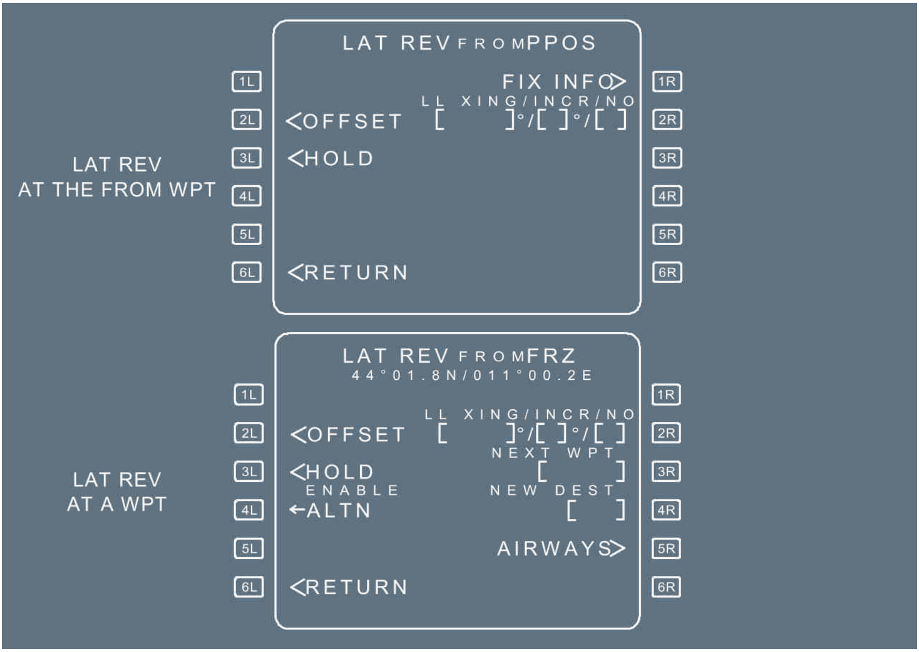
[3L] HOLD	This prompt gives the flight crew access to the hold pages.
[4L] ENABLE ALTN	This prompt allows the flight crew to switch to the alternate flight plan at the selected revision waypoint and use it as a new active flight plan. The system never displays this prompt at the FROM waypoint.
[5L] ALTN	This prompt gives the flight crew access to alternate airport page. The system displays it only at the destination.
[6L] RETURN	This prompt returns the display to the flight plan page.
[1R] ARRIVAL	The flight crew uses this prompt to call up the arrival pages, where the flight crew can select and insert RWY, APPR, STAR TRANS and VIA.
[1R] FIX INFO	FIX INFO is only displayed on the lateral revision page at the origin or at the FROM waypoint. This prompt gives the flight crew access to the FIX INFO page.
[2R] LLXING/INCR/NO	This prompt allows the flight crew to create latitude/longitude crossing point. The increment (INCR) ranges from 1 to 20 °, and the number of crossing point (from 1 to 99). This prompt is not displayed for waypoints belonging to the descent procedure.
[3R] NEXT WPT	The flight crew uses this prompt to enter the next waypoint. If this waypoint is a latitude/longitude, or is not in the database nor in the flight crew-defined elements, the display reverts to the NEW WAYPOINT PAGE. For details, *Refer to DSC-22_20-30-10-15 Inserting a Waypoint - General*.
[4R] NEW DEST	The flight crew uses this prompt to enter a new destination. For details, *Refer to DSC-22_20-30-10-15 Inserting a New Destination*.
[5R] AIRWAYS	The flight crew uses this prompt to access the AIRWAYS page.
[6R] INSERT	The system displays this prompt when the flight crew has created a temporary flight plan. The flight crew can use it to activate the temporary flight plan.

Ident.: DSC-22_20-50-10-25-C-00006766.0003001 / 01 OCT 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

These pages give the flight crew a list of the lateral flight plan revisions, which can be used to change the flight plan beyond a selected waypoint.
The flight crew calls up these pages from the flight plan pages (A or B) by pressing the left key adjacent to the selected waypoint.
Different lateral flight plan revisions are available for different waypoints.


LAT REV AT THE ORIGIN
LAT REV FROM LSGG
45°12.0N/007°27.2E
<DEPARTURE
FIX INFO>
LL XING/INCR/NO
<OFFSET
[ ]°/[ ]°/[ ]
NEXT WPT
[ ]
ENABLE
←ALTN
NEW DEST
[ ]
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LAT REV AT THE DESTINATION
LAT REV FROM LGAT
37°53.8N/023°43.7E
ARRIVAL>
NEXT WPT
[ ]
ENABLE
←ALTN
<ALTN
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R


LAT REV
AT THE FROM WPT
LAT REV FROM PPOS
FIX INFO>
LL XING/INCR/NO
<OFFSET [ ]°/[ ]°/[ ]
<HOLD
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
LAT REV
AT A WPT
LAT REV FROM FRZ
44°01.8N/011°00.2E
LL XING/INCR/NO
<OFFSET [ ]°/[ ]°/[ ]
NEXT WPT
<HOLD [ ]
ENABLE
NEW DEST
←ALTN [ ]
AIRWAYS>
<RETURN

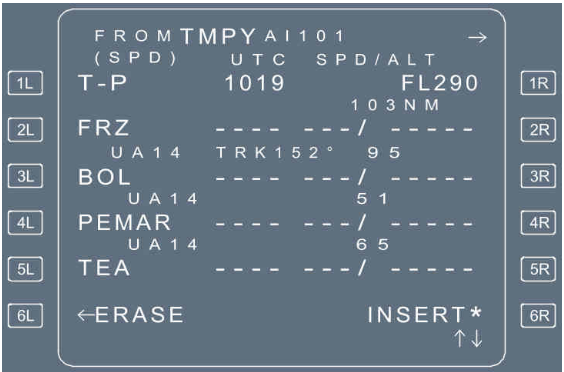
TITLE	The ident of the waypoint or airport selected for revision, along with its latitude and longitude. If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and displays the "PPOS" (present position) instead.
[1L] DEPARTURE	This prompt gives access to the departure pages, where the flight crew can select and insert runways, SIDs, and TRANSs.
[2L] OFFSET	This prompt gives access to the OFFSET page.
[3L] HOLD	This prompt gives access to the hold pages.
[4L] ENABLE ALTN	This prompt enables the flight crew to switch to the alternate flight plan at the selected revision waypoint, and use it as a new active flight plan. The system never displays this prompt at the FROM waypoint.
[5L] ALTN	This prompt gives access to the alternate airport page. The system displays it only at the destination.
[6L] RETURN	This prompt returns the display to the flight plan page.
[1R] ARRIVAL	This prompt calls up the arrival pages, where the flight crew can select and insert RWY, APPR, STAR TRANS and VIA.

[1R] FIX INFO	FIX INFO is only displayed on the lateral revision page at the origin or FROM waypoint. It gives access to the FIX INFO page.
[2R] LLXING/INCR/NO	This prompt enables the flight crew to create the latitude/longitude crossing point. The increment (INCR) ranges from 1 to 20 °, and the number of crossing points from 1 to 99. This prompt is not displayed for waypoints belonging to the descent procedure.
[3R] NEXT WPT	The flight crew uses this prompt to enter the next waypoint. If this waypoint is a latitude/longitude, or is neither in the database nor in the pilot-defined elements, the display reverts to the NEW WAYPOINT PAGE.
[4R] NEW DEST	The flight crew uses this prompt to enter a new destination.
[5R] AIRWAYS	The flight crew uses this prompt to access the AIRWAYS page.
[6R] INSERT	This prompt is displayed when the flight crew has created a temporary flight plan. The flight crew can use it to activate the temporary flight plan.

Ident.: DSC-22_20-50-10-25-C-00006767.0001001 / 10 DEC 09
Applicable to: ALL

TEMPORARY REVISION

When the pilot selects a lateral revision, the system creates a “Temporary F-PLN” and displays it in yellow on the MCDU and as a yellow dashed line on the ND to allow the pilot to review the data before inserting. As long as the temporary flight plan is not inserted, the previous flight plan is still active and the system guides the aircraft along it.



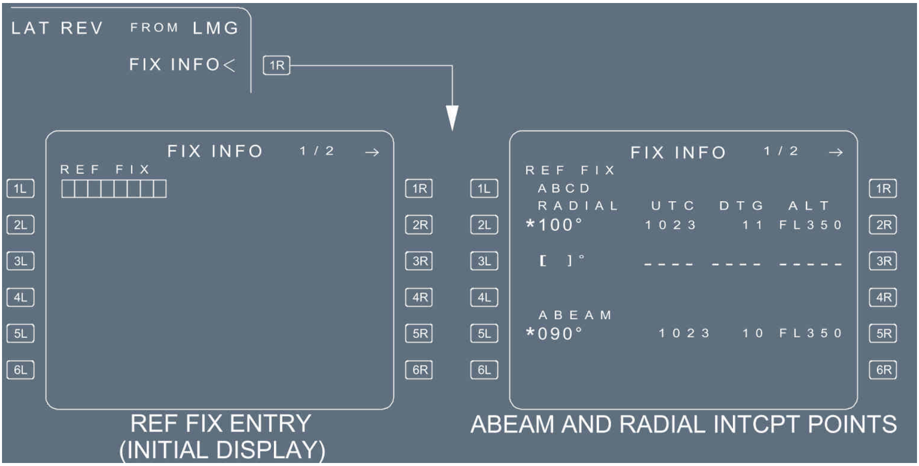
```
 FROM TMPY AI101                 →
 (SPD)     UTC   SPD/ALT
T-P        1019        FL290
                   103NM
FRZ        ----  ---/ -----
   UA14    TRK152°  95
BOL        ----  ---/ -----
     UA14           51
PEMAR      ----  ---/ -----
     UA14           65
TEA        ----  ---/ -----

←ERASE              INSERT*
                        ↑↓
```

TEMPORARY F-PLN A PAGE

FIX INFO PAGE

Ident.: DSC-22_20-50-10-25-00006768.0001001 / 17 MAR 11
Applicable to: LV-GKO, LV-GKP

This page provides access to the RADIAL intercept function.
The reference may be one or more radial bearings based on a given database fix or a pilot defined element.
If the radial intercepts the active flight plan, the intersection point can be converted to a waypoint and inserted into the flight plan. In addition, the ABEAM function may be used.
The FIX INFO page may be accessed from the lateral revision page at origin or at the FROM waypoint.


LAT REV FROM LMG
FIX INFO<
1R
FIX INFO 1/2 →
REF FIX
□□□□□□□
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/2 →
REF FIX
ABCD
RADIAL UTC DTG ALT
*100° 1023 11 FL350
[ ]° ---- ---- -----
ABEAM
*090° 1023 10 FL350
REF FIX ENTRY
(INITIAL DISPLAY)
ABEAM AND RADIAL INTCPT POINTS

[1L] REF FIX (blue)	Allows entries of the REF FIX. This reference may be any database element (navaid, waypoint, NDB, airport, runway) or a pilot defined element. Prior to entry, amber boxes are displayed.
Line 2 to line 4 RADIAL (blue)	Allows entry of a radial from the REF FIX. If the radial line intersects the active flight plan, the FMGES will compute the time, the along path DTG (Distance To Go) and the altitude at the intersection point (green small font). A blue large star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the pilot stored elements. Format of the created waypoint is : XXXNNN XXX = 3 first letters of REF FIX ident. NNN = value of the radial

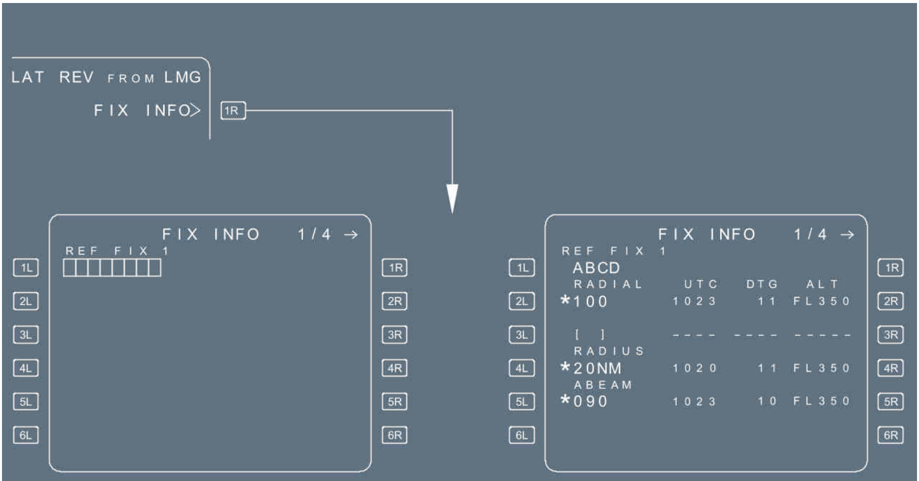
[5L] - [5R] ABEAM	This function enables the pilot to create waypoints on a flight plan (primary or secondary) that are abeam a reference fix. Once computed, the page displays the radial number in green large font. Time, distance and altitude predictions are displayed in green small font. Selecting the key adjacent to the star creates the waypoint and inserts it into the flight plan. The waypoint is identified by AB + the REF FIX ident e.g. AB TLS. Abeam waypoints are not stored in the pilot stored waypoint database.

Note: *Two FIX INFO pages are available, providing the capability to define two different REF FIX elements.*

FIX INFO PAGE

Ident.: DSC-22_20-50-10-25-00006768.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The FIX INFO pages provides access to the RADIAL, CIRCLE and ABEAM intercept functions.
The reference may be a given database fix or a flight crew-defined element.
If the radial, circle or abeam intercepts the active flight plan, the intersection point can be converted to a waypoint and inserted into the flight plan.
The FIX INFO pages may be accessed from the LAT REV page, after performing a lateral revision at the origin airport, or at FROM or at any F-PLN waypoint of the primary flight plan (except Destination).


LAT REV FROM LMG
FIX INFO>
1R
FIX INFO 1/4 →
REF FIX 1
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
FIX INFO 1/4 →
REF FIX 1
ABCD
RADIAL UTC DTG ALT
*100 1023 11 FL350
[ ] ---- ---- -----
RADIUS
*20NM 1020 11 FL350
ABEAM
*090 1023 10 FL350

REF FIX ENTRY
(INITIAL DISPLAY)

ABEAM, RADIAL and CIRCLE INTCPT POINTS

[1L] REF FIX (blue)	Enables entry of the REF FIX. This reference may be any database element (NAVAID, waypoint, NDB, airport, runway) or a flight crew-defined element. Before any entry, amber boxes are displayed.
[2L] – [2R] to [3L] – [3R] RADIAL (blue)	Enables entry of a radial from the REF FIX. If the radial line intersects the active flight plan, the FMGES will compute the time, the along path DTG (Distance To Go), and the altitude at the intersection point (small green font). A large blue star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the flight crew-stored elements. It is automatically labelled : "XXXNNN" XXX = First 3 letters of the REF FIX IDENT. NNN = value of the radial

[4L] - [4R] RADIUS	This function enables the flight crew to enter a radius that defines a circle around the REF FIX. When the circle intercepts the current flight path, the FMGES will compute the time, the along path distance and the altitude at the first intersection point, from the current aircraft position (small green front). A large blue star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the flight crew-stored elements. The waypoint is automatically labelled : “DXXXNNN” NNN = Value of the radius XXX = First 3 letters of the REF FIX IDENT.

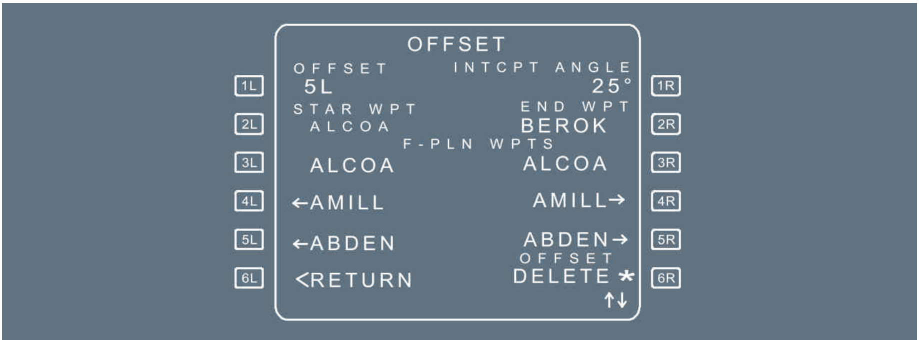
<u>Note:</u> *Four FIX INFO pages, providing the capability to define four different REF FIX elements, are available.*

OFFSET PAGE

Ident.: DSC-22_20-50-10-25-00014242.0001001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

This page allows the flight crew to insert a preplanned offset into the flight plan by entering:
- A start waypoint
- An end waypoint
- An offset distance to the left or to the right
- The intercept angle value.

The flight crew calls up this page from the LATERAL REVISION page, by pressing [2L] key.



```
                OFFSET
      OFFSET           INTCPT ANGLE
 1L   5L                        25°   1R
      STAR WPT             END WPT
 2L    ALCOA                 BEROK    2R
             F-PLN WPTS
 3L    ALCOA                 ALCOA    3R
 4L   ←AMILL                 AMILL→   4R
 5L   ←ABDEN                 ABDEN→   5R
                            OFFSET
 6L   <RETURN              DELETE *   6R
                                 ↑↓
```

TITLE	OFFSET in white large font. If a temporary flight plan exists, it is displayed in yellow large font.

[1L] OFFSET	This field displays the lateral offset distance, left or right, in the flight plan. The offset may be between 1 and 50 NM. Blue brackets are displayed until an offset is inserted. When the flight crew enters an offset, or modifies another element in the OFFSET page, the OFFSET field becomes yellow. One time the temporary flight plan is inserted, the field becomes blue. The flight crew can delete an inserted offset either by pressing the CLR key, by entering a zero for the amount of the offset, or by pressing OFFSET DELETE in 6L field.
[2L] START WPT	The START WPT ident for the offset is displayed in yellow if a temporary flight plan exists, in blue if already inserted, or in green when the field is not modifiable. The default START WPT shall be the waypoint where the lateral revision is performed, the first waypoint offsettable, or PPOS if the offset is currently flown. This waypoint can also be selected from the list of waypoints in the fields 3L to 5L, or can be manually entered by the flight crew.
[3L] to [5L]	Display the start waypoints available for selection. Two scrolling list are available. The active start waypoint is displayed in green in the list. Other waypoints are displayed in blue. The currently selected start waypoint does not have selection arrow associated.
[6L] RETURN ERASE	RETURN: The flight crew presses this key to return to the last displayed LAT REV page. ERASE: It is displayed when a temporary flight plan has been created, and it enables the flight crew to erase the temporary flight plan.
[1R] INTCPT ANGLE	This field displays the intercept angle. The angle may be between 10 ° and 50 °. The intercept angle in the AMI is the default value, and is shown in blue. When the flight crew enters an intercept angle, or modifies another element in the OFFSET page, the field becomes yellow. One time the temporary flight plan is inserted, the field becomes blue.
[2R] END WPT	The END WPT ident for the offset is displayed in yellow if a temporary flight plan exists, or in blue if already inserted. The default END WPT shall be the waypoint terminating the last consecutive offsettable leg from default or currently selected START WPT. This waypoint can also be selected from the list of waypoints in the fields 3R to 5R, or can be manually entered by the flight crew.

[3R] to [5R]	Display the end waypoints available for selection. Two scrolling lists are available. The active end waypoint is displayed in green in the lists. Other waypoints are displayed in blue. The currently selected end waypoint does not have selection arrow associated.
[6R] INSERT OFFSET DELETE	INSERT: This field allows the flight crew to activate the temporary flight plan and reverts the display to the active flight plan. This field is displayed when the offset segment is completely defined on OFFSET page. OFFSET DELETE: This prompt enables the flight crew to create a temporary flight plan where the predefined offset is canceled. This field is displayed when an offset exists in the active flight plan.

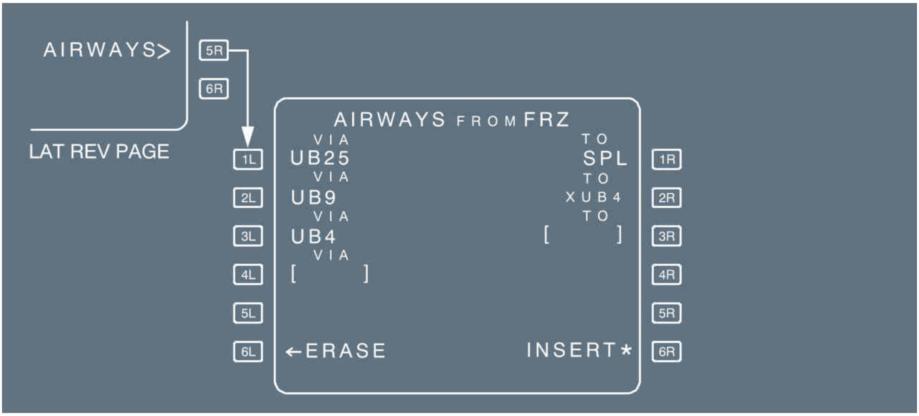
Note: *If the waypoint lists in lines 3 to 5 do not fit in one page, the flight crew can scroll in an open loop, two lines by two lines. To keep the initial order of the list, two markers appear:*

- *- START OF LIST - : This marker is displayed at the beginning of the list*
- *- END OF LIST - : This marker is displayed at the end of the list.*

AIRWAYS PAGE

Ident.: DSC-22_20-50-10-25-00006769.0001001 / 01 OCT 12
Applicable to: LV-GKO, LV-GKP

This page allows the pilot to select up to five airways for stringing into the flight plan after the revise waypoint.
The pilot calls up this page by pressing the lateral revision page [5R] key.



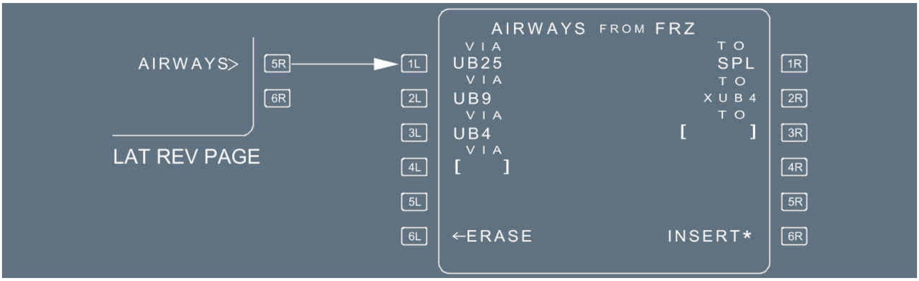
TITLE	Revise point ident (large green font)
[1L] to [5L] VIA	This field displays the airways entered by the pilot.

[6L] ERASE or RETURN	The flight crew presses this key to return to the lateral revision page. This field displays ERASE when a temporary flight plan is created. It allows to erase the temporary flight plan.
[1R] to [5R] TO	Displays the ending points of the corresponding airways entered on the [1L] to [5L] entries. The ending point is displayed in large blue font if manually entered, in blue small font if FMGEC computed.
[6R] INSERT (amber)	Allows to insert the entered VIA/TO segments into the flight plan. The display reverts to the F-PLN page.

AIRWAYS PAGE

Ident.: DSC-22_20-50-10-25-00006769.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

This page allows the pilot to select up to five airways for stringing into the flight plan after the revise waypoint.
The pilot calls up this page by pressing the lateral revision page [5R] key.



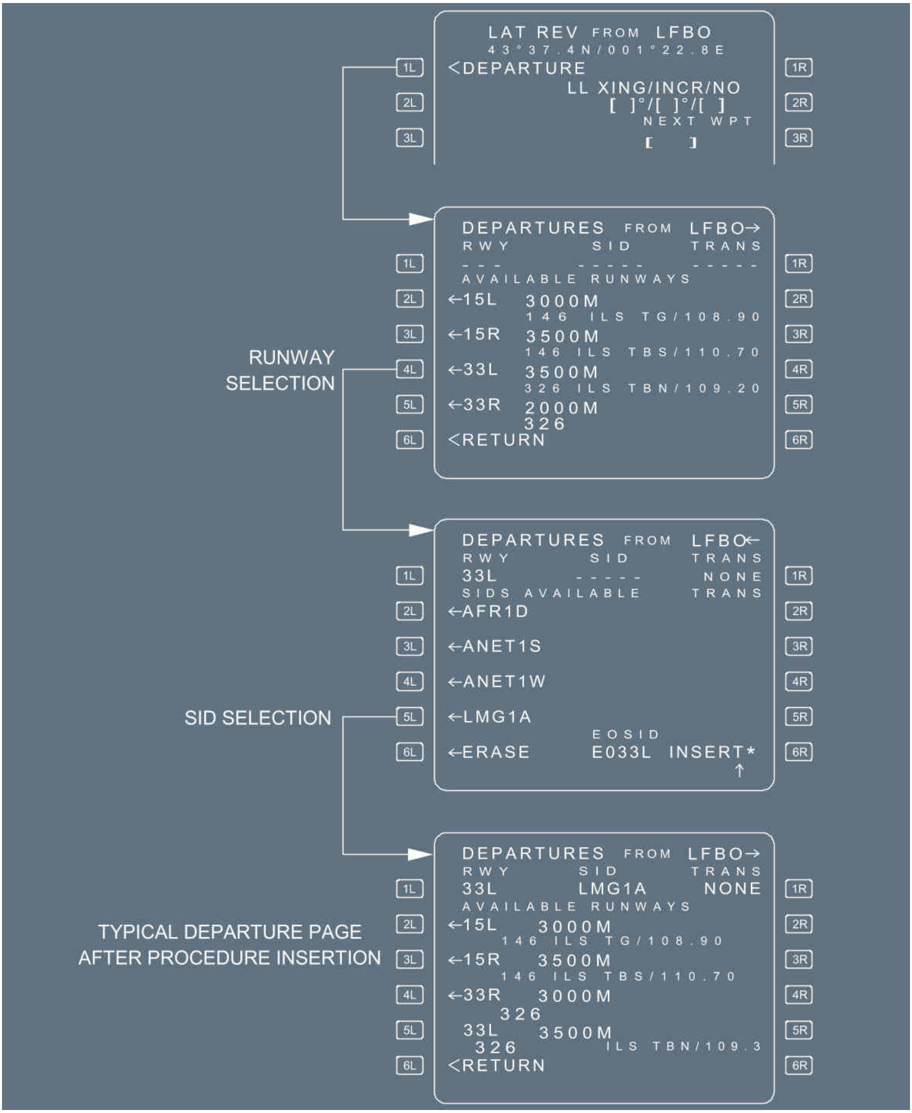
TITLE	Revise point ident (large green font)
[1L] to [5L] VIA	This field displays the airways entered by the pilot.
[6L] ERASE or RETURN	The flight crew presses this key to return to the lateral revision page. This field displays ERASE when a temporary flight plan is created. It allows to erase the temporary flight plan.
[1R] to [5R] TO	Displays the ending points of the corresponding airways entered on the [1L] to [5L] entries. The ending point is displayed in large blue font if manually entered, in blue small font if FMGEC computed.
[6R] INSERT (amber)	Allows to insert the entered VIA/TO segments into the flight plan. The display reverts to the F-PLN page.

Note: 1. *If the entered airway contains at least one fixed radius transition waypoint as defined in the navigation database, and the TO waypoint is defined and, the fixed radius transition waypoint is in the flight plan, then, "FIXED TURN RADIUS AWY" is displayed between the VIA and TO fields.*
2. *If the condition for display "FIXED TURN RADIUS AWY" is satisfied for two consecutive airways lines, the second line displays (") instead of the whole message.*

DEPARTURE PAGES

Ident.: DSC-22_20-50-10-25-00006789.0001001 / 16 MAR 11
Applicable to: ALL

These pages allow the pilot to review departure procedures (RWY, SID, TRANS) and enter them into the active flight plan.
The pilot calls them up by pressing the 1L key when the display is showing the lateral revision page for the origin.
Three pages are available : RWY, and SIDs and TRANS (if any).
The pilot calls up each page sequentially either by selecting a data item (such as RWY) or by pressing the [→] key on the MCDU console.


LAT REV FROM LFBO
43°37.4N/001°22.8E
<DEPARTURE
LL XING/INCR/NO
[ ]°/[ ]°/[ ]
NEXT WPT
[ ]
DEPARTURES FROM LFBO→
RWY SID TRANS
--- ----- -----
AVAILABLE RUNWAYS
←15L 3000M
146 ILS TG/108.90
←15R 3500M
146 ILS TBS/110.70
←33L 3500M
326 ILS TBN/109.20
←33R 2000M
326
<RETURN
RUNWAY SELECTION
DEPARTURES FROM LFBO←
RWY SID TRANS
33L ----- NONE
SIDS AVAILABLE TRANS
←AFR1D
←ANET1S
←ANET1W
←LMG1A
←ERASE
EOSID
E033L INSERT*
SID SELECTION
DEPARTURES FROM LFBO→
RWY SID TRANS
33L LMG1A NONE
AVAILABLE RUNWAYS
←15L 3000M
146 ILS TG/108.90
←15R 3500M
146 ILS TBS/110.70
←33R 3000M
326
33L 3500M
326 ILS TBN/109.3
<RETURN
TYPICAL DEPARTURE PAGE
AFTER PROCEDURE INSERTION
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

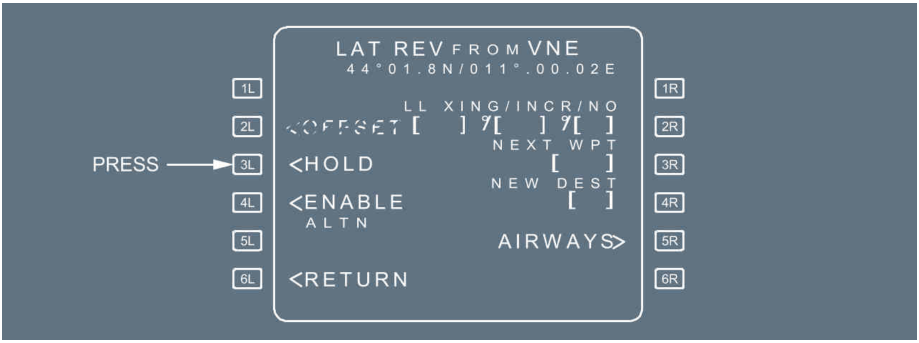
Line 1 RWY, SID TRANS	This line displays the RWY, SID, and TRANS in green after they have been inserted into the active flight plan or in yellow if selected but not yet inserted. If nothing has been selected or inserted, the line displays dashes.

[2L] to [5L] RWY's/SID's	These fields display selectable and selected RWYs or SIDs (including EOSID and NO SID option). The pilot can slew each list. Selectable RWYs and SIDs are displayed in blue with an arrow. Once a RWY or SID is selected, the arrow disappears. A RWY or SID already inserted in the flight plan is displayed in green. The display shows the length, heading (T if true North referenced), and, if available, the ILS ident and frequency for each runway.
[6L] ERASE or RETURN	The pilot presses this key to erase a selected data item and revert to the previous selection. If the pilot erases the page, the display reverts to the active flight plan page. The display shows RETURN instead of ERASE when the pilot has not created a temporary flight plan.
[2R] to [5R] TRANS	This field displays the selectable and selected en route transitions respectively in blue and green. They are blank if there are no transitions.
[6R] INSERT or BLANK	The pilot uses this key to insert a temporary procedure into the flight plan. The page reverts to the active flight plan page when the insertion is completed. It is associated with RETURN (6L).
[6M] EOSID	Once a runway is inserted into the flight plan, this field displays any ENG OUT SID for that runway. If there is none, it displays NONE.

HOLD PAGES

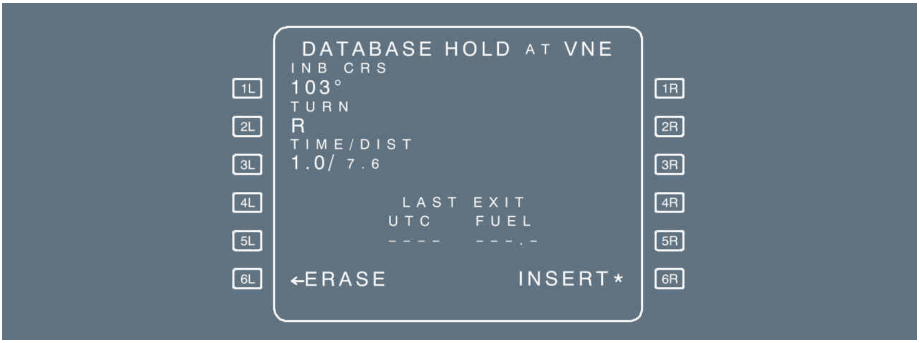
Ident.: DSC-22_20-50-10-25-00006800.0001001 / 01 OCT 12
Applicable to: ALL

These pages allow the pilot to review and modify the holding pattern parameters at the selected revise waypoint. The holding pattern data may come from the database or may be defaulted to standard dimensions.
The pilot calls up these pages by pressing the HOLD key on the LAT REV page for the waypoint.
Three different HOLD pages are available :



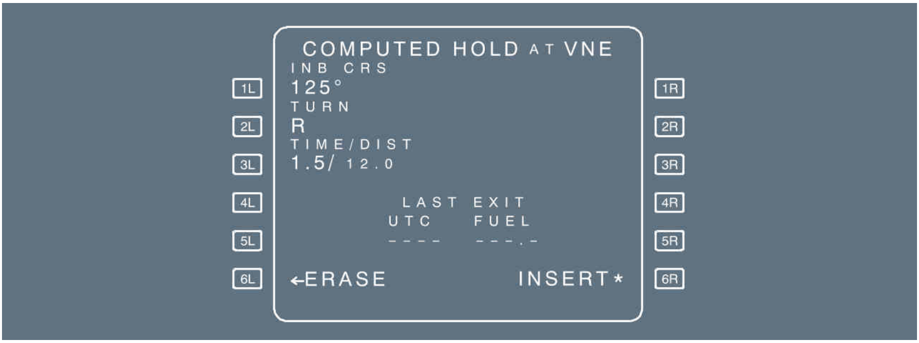
LAT REV FROM VNE
44°01.8N/011°.00.02E
LL XING/INCR/NO
<OFFSET [ ]°/[ ]°/[ ]
NEXT WPT
<HOLD [ ]
NEW DEST
<ENABLE [ ]
ALTN
AIRWAYS>
<RETURN

- **DATABASE HOLD AT...**
  The database has a holding pattern for the selected revise waypoint, but has not been inserted in the flight plan yet.



DATABASE HOLD AT VNE
INB CRS
103°
TURN
R
TIME/DIST
1.0/7.6
LAST EXIT
UTC FUEL
---- ---.-
←ERASE INSERT*

- **COMPUTED HOLD AT...**
  The database has no holding pattern for the selected revised waypoint.
  The system proposes default holding pattern data.



COMPUTED HOLD AT VNE
INB CRS
125°
TURN
R
TIME/DIST
1.5/ 12.0
LAST EXIT
UTC FUEL
---- ---.-
←ERASE INSERT*

INB CRS = INBD TRK of the F-PLN leg leading to the revised waypoint.

TURN = Turn direction right.

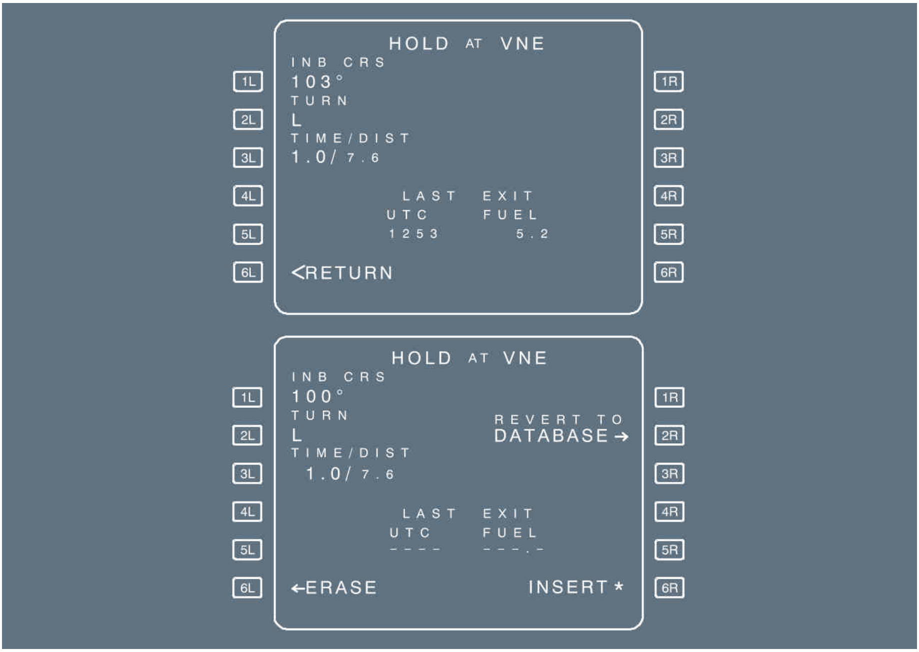
TIME on outbound leg is 1.5 min above 14 000 ft, 1 min below 14 000 ft.

[2R] field shows “REVERT TO COMPUTED” when the pilot has modified the holding pattern.

- **HOLD AT...**

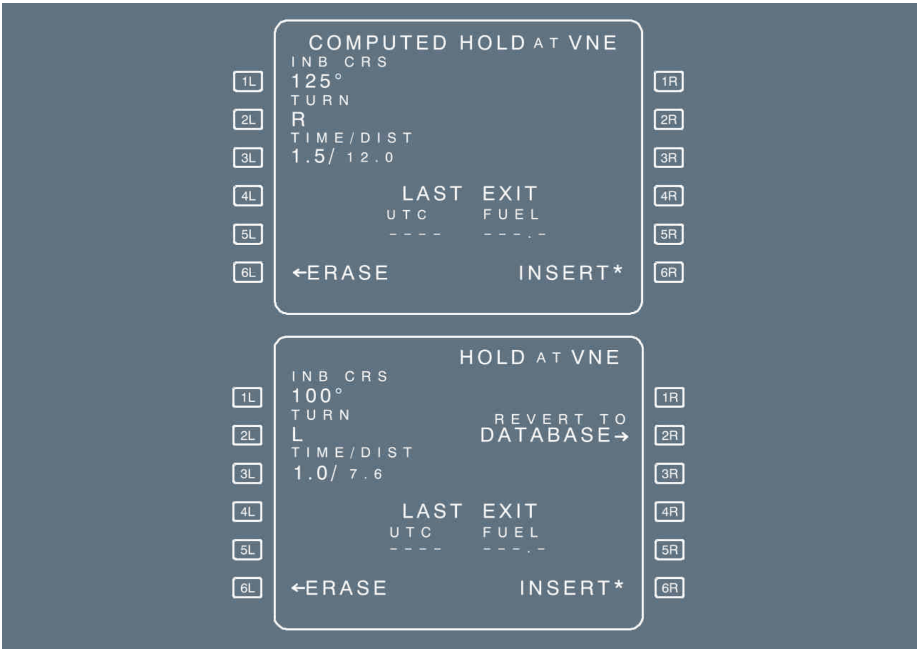
  The flight plan contains a holding pattern that is defined in the database.

  If the pilot has modified holding pattern data from the database, but has not inserted it in the flight plan yet, the field next to [2R] displays “REVERT TO DATABASE” or “REVERT TO COMPUTED” to allow the pilot to revert to defaulted parameters.



```
        HOLD AT VNE
INB CRS
103°
TURN
L
TIME/DIST
1.0/7.6

           LAST    EXIT
          UTC      FUEL
          1253      5.2

<RETURN
```

```
        HOLD AT VNE
INB CRS
100°
TURN                  REVERT TO
L                     DATABASE→
TIME/DIST
 1.0/7.6

           LAST    EXIT
           UTC     FUEL
           ----    ---.-

←ERASE              INSERT*
```



```
 COMPUTED HOLD AT VNE
INB CRS
125°
TURN
R
TIME/DIST
1.5/ 12.0
             LAST  EXIT
             UTC   FUEL
             ----  ---.-
←ERASE              INSERT*
```

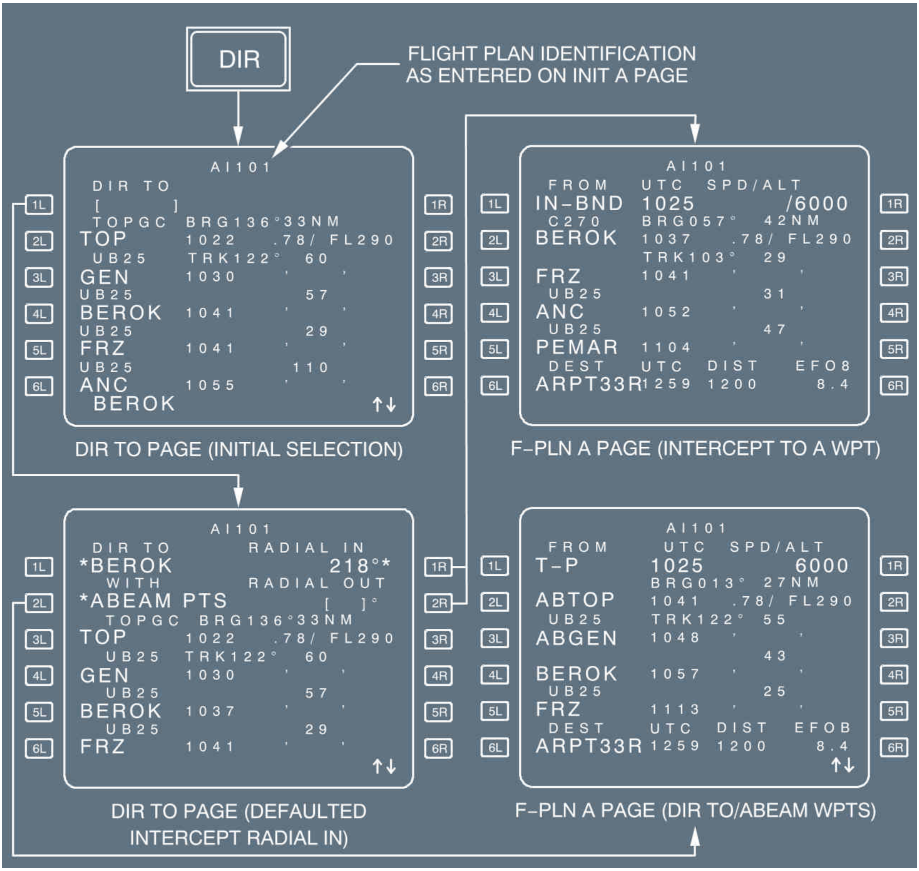
```
                HOLD AT VNE
INB CRS
100°
TURN                REVERT TO
L                   DATABASE→
TIME/DIST
1.0/ 7.6
             LAST  EXIT
             UTC   FUEL
             ----  ---.-
←ERASE              INSERT*
```

[1L] INB CRS	This field displays the inbound course of the holding pattern. The data may be modified.
[2L] TURN	This field shows the direction to turn in the hold (L or R). The data may be modified.
[3L] TIME/DIST	This field shows the time and distance for the outbound leg. The data may be modified. Time and distance are dependent values that the system calculates from the predicted ground speed, which in turn depends upon the holding speed (speed for maximum endurance, ICAO speed limit, or constraint speed, whichever is lower).
[6L] ERASE or RETURN	The pilot presses this key when the field shows ERASE to erase the holding pattern. The pilot presses this key when the field shows RETURN to return to the LAT REV page if the hold is already inserted in the flight plan.

[2R] REVERT TO DATABASE or REVERT TO COMPUTED	The pilot presses this key to delete manual modifications to the database hold (or computed hold) and revert to database (or computed) holding data.
[6R] INSERT	The pilot presses this key to insert the hold into the active flight plan.
LAST EXIT UTC FUEL	This field displays the time at which the aircraft must leave the holding pattern in order to meet fuel policy criteria (extra fuel = 0). The system also displays the estimated fuel on board at that time.

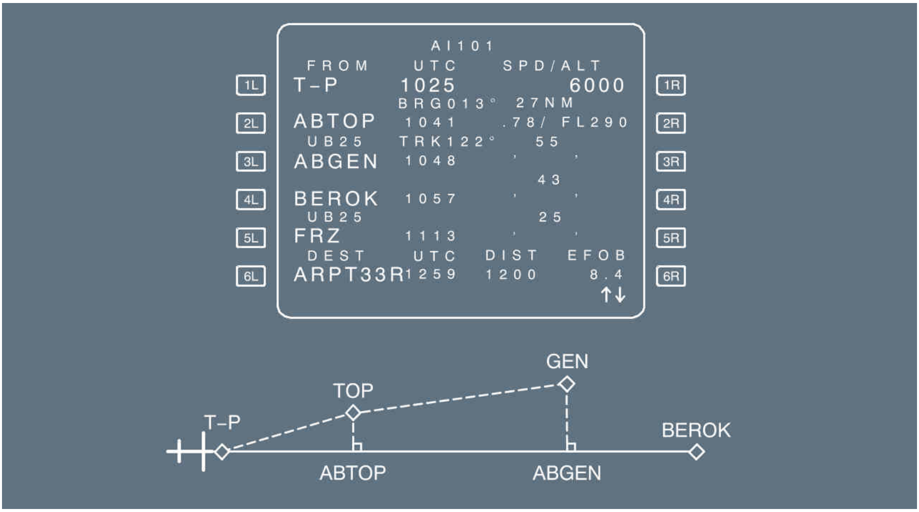
DIRECT TO PAGE

Ident.: DSC-22_20-50-10-25-00006808.0001001 / 23 JUN 15
Applicable to: ALL


DIR
FLIGHT PLAN IDENTIFICATION AS ENTERED ON INIT A PAGE
AI101
DIR TO
[ ]
TOPGC BRG136°33NM
TOP 1022 .78/ FL290
UB25 TRK122° 60
GEN 1030
UB25 57
BEROK 1041
UB25 29
FRZ 1041
UB25 110
ANC 1055
BEROK ↑↓
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
DIR TO PAGE (INITIAL SELECTION)
AI101
FROM UTC SPD/ALT
IN-BND 1025 /6000
C270 BRG057° 42NM
BEROK 1037 .78/ FL290
TRK103° 29
FRZ 1041
UB25 31
ANC 1052
UB25 47
PEMAR 1104
DEST UTC DIST EFOB
ARPT33R 1259 1200 8.4
F-PLN A PAGE (INTERCEPT TO A WPT)
AI101
DIR TO RADIAL IN
BEROK 218°
WITH RADIAL OUT
*ABEAM PTS [ ]°
TOPGC BRG136°33NM
TOP 1022 .78/ FL290
UB25 TRK122° 60
GEN 1030
UB25 57
BEROK 1037
UB25 29
FRZ 1041
↑↓
DIR TO PAGE (DEFAULTED INTERCEPT RADIAL IN)
AI101
FROM UTC SPD/ALT
T-P 1025 6000
BRG013° 27NM
ABTOP 1041 .78/ FL290
UB25 TRK122° 55
ABGEN 1048
43
BEROK 1057
UB25 25
FRZ 1113
DEST UTC DIST EFOB
ARPT33R 1259 1200 8.4
↑↓
F-PLN A PAGE (DIR TO/ABEAM WPTS)

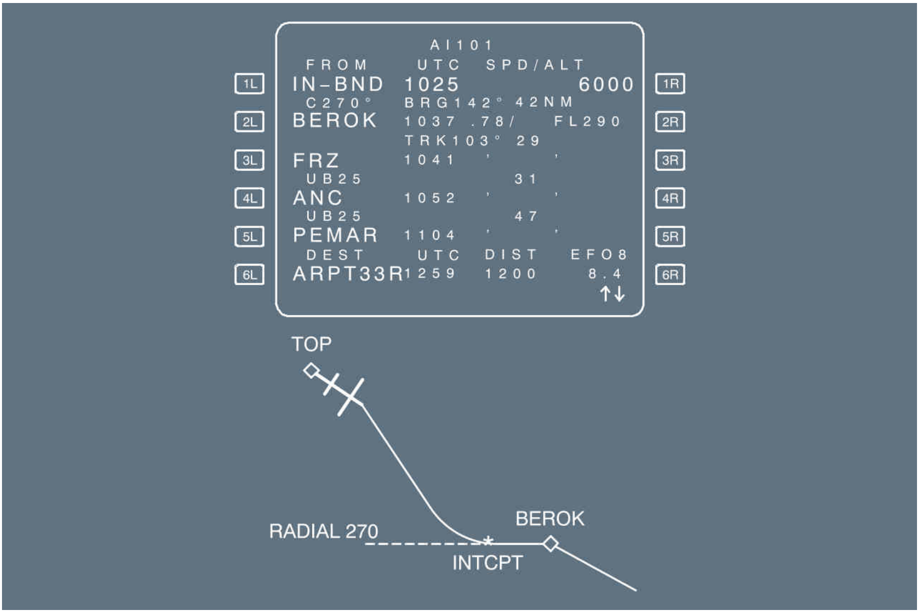
Pressing the “DIR” key under the MCDU screen brings up the DIR TO page. The [1L] key on this page is the DIR TO key. The pilot presses it to modify the flight plan by creating a direct leg from the aircraft’s present position to any selected waypoint. When in NAV mode, the pilot must use this key to modify the active leg or the TO waypoint. The pilot cannot call up this page when the aircraft’s present position is not valid.

[1L] DIR TO	Pressing this key selects the DIRECT TO or INTERCEPT waypoint. The pilot can identify the waypoint to be inserted by using its identifier, its latitude and longitude, place/bearing/distance, or place-bearing/place-bearing. *Note: If the entered DIR TO is a latitude/longitude, the NEW WAYPOINT page is automatically called up.* If the pilot does not select the RADIAL IN (1R) or RADIAL OUT (2R) or ABEAM PTS (2L), the DIR TO function routes the aircraft from the present position to the waypoint inserted in the DIR TO field.
Line 3 to Line 6	These lines display the active flight plan with time/speed/distance predictions. The display may be slewed ↑↓. Pressing any key activates the DIRECT TO function from present position to the waypoint adjacent to that key.
[2L] ABEAM PTS	The flight crew presses this key to activate the DIR TO/ABEAM function which projects perpendiculary the flight plan waypoints on the DIR TO leg :



```
                AI101
   FROM          UTC        SPD/ALT
T-P             1025           6000
               BRG013°    27NM
ABTOP           1041      .78/ FL290
   UB25        TRK122°      55
ABGEN           1048        '      '
                           43
BEROK           1057        '      '
   UB25                    25
FRZ             1113        '      '
   DEST          UTC    DIST    EFOB
ARPT33R1259             1200     8.4
                                  ↑↓
```

[1R] RADIAL IN and [2R] RADIAL OUT	The pilot fills these fields to define a QDM or a QDR associated to the waypoint defined in 1L. These keys activate respectively the DIRTO/INTERCEPT TO and DIRTO/INTERCEPT FROM functions. The pilot enters the radial in or radial out as : XXX T or XXX M, XXX being the radial, and T or M depending on the reference (true or magnetic). If T or M is not precised, the reference selected on the TRUE/MAG switch is used. The aircraft intercepts from its current position and track the selected waypoint and QDM (or QDR) to (or from) this waypoint.



```
            AI101
  FROM      UTC   SPD/ALT
IN-BND     1025        6000
  C270°    BRG142° 42NM
BEROK      1037 .78/   FL290
           TRK103°  29
FRZ        1041  '       '
  UB25              31
ANC        1052  '       '
  UB25              47
PEMAR      1104  '       '
  DEST      UTC   DIST   EFO8
ARPT33R1259      1200     8.4
                           ↑↓
```

If the DIR TO/INTCPT WPT entry is to a waypoint already in the flight plan, a defaulted RADIAL IN is displayed in small font. However no radial is displayed on ND for this default radial. No default radial is provided for the RADIAL OUT field.

Selecting the INTCPT TO (RADIAL IN [1R]) function:
- activates the intercept radial INTO the WPT
- sets the course = radial IN + 180 °
- reverts the display to F-PLN A page.

Selecting the INTCPT TO (RADIAL IN [2R]) function :

- activates the of the intercept radial FROM the WPT
- sets the course = radial OUT
- reverts the display to F-PLN A page.

For detail (*Refer to DSC/22_20 Auto Flight - Flight Management / 30 Flight Planning / 10 Lateral Fonctions / Direct-TO-Fonction*)

Note: *It is not recommended to use the DIR TO function when the aircraft is on the ground. The use of the DIR TO function when the aircraft is on the ground may result in the loss of all the departure data, that includes both of the following:*

- *The takeoff speeds*
- *The derated level, or the flexible temperature.*

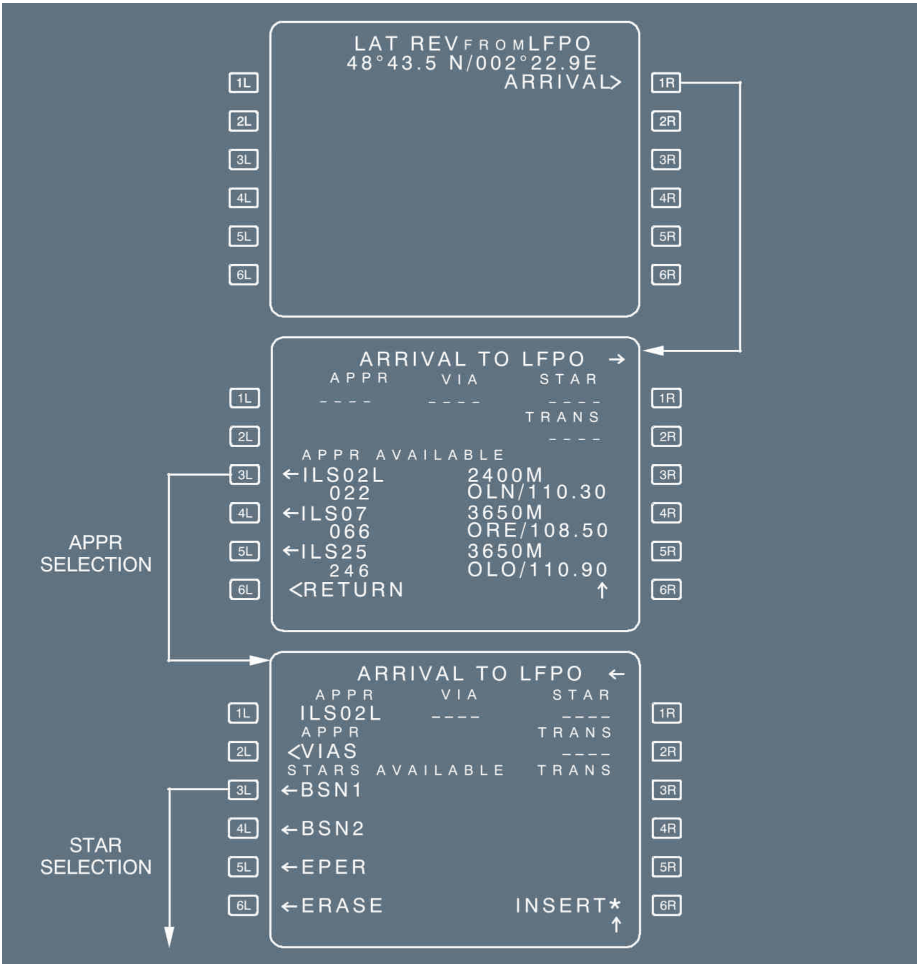
ARRIVAL PAGES

Ident.: DSC-22_20-50-10-25-00006818.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

These pages allow the pilot to review arrival procedures (approaches, VIAs, STARs, TRANS) and insert them into the active flight plan.
The pilot calls them up from the LAT REV page for the destination by pressing 1R key.
Three pages, APPR, STAR, and VIA, are available, along with a fourth, TRANS, if there are any transitions.
The pilot calls up each page sequentially either by selecting a data item (such as APPR) or by pressing the [→] key on the MCDU console.

Line [1L] - [1R] [2R]	This line displays the APPR, VIA, STAR, and TRANS in green if they have been inserted in the flight plan, and in yellow, as temporary flight plan, if they have been selected but not yet inserted. It displays dashes or NONE if nothing has been selected or inserted.
[2L] APPR VIAS	The pilot presses this key to call up transitions from the last point of the STAR to first point of the approach.

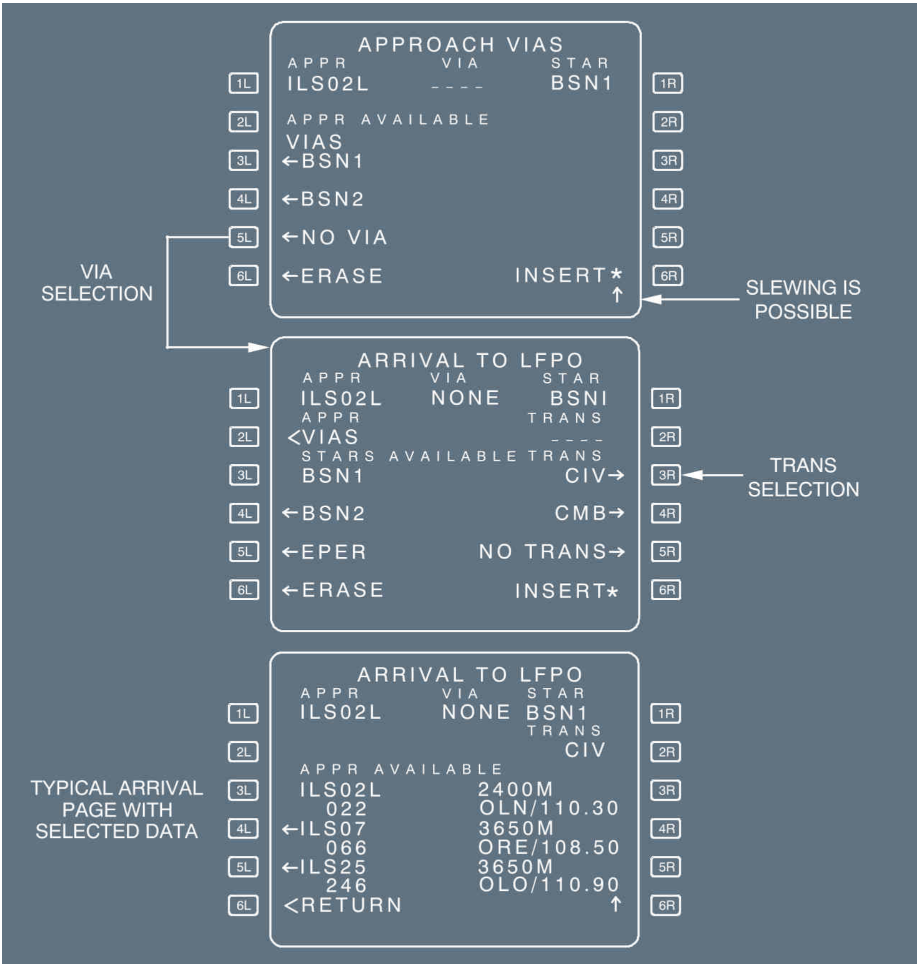
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can slew the pages, when necessary. Selectable APPRs, STARs, and VIAs are displayed in blue with an arrow. Once the pilot has selected an APPR, STAR, or VIA, the arrow disappears. After the APPR, STAR, or VIA is inserted into the flight plan, it is displayed in green. For each approach the display shows runway length, heading (T if true North referenced), and the frequency and identifier of the ILS when ILS is available.
[6L] ERASE or RETURN	The pilot presses this key to erase selected data and revert to the previous selection. The page reverts to the LAT REV page. The field displays “RETURN” instead of ERASE when the flight crew has not created a temporary flight plan.
[3R] to [5R] TRANS	These fields display selectable and selected en route transitions (if any). They are blue when selected, and become green when inserted into the active flight plan.
[6R] INSERT	The pilot presses this key to insert the temporary procedure into the active flight plan. The page reverts to the active flight plan page when this happens.


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
APPR SELECTION
STAR SELECTION

```
   LAT REV FROM LFPO
 48°43.5 N/002°22.9E
             ARRIVAL>
```

```
    ARRIVAL TO LFPO  →
 APPR      VIA     STAR
 ----      ----    ----
                  TRANS
                   ----
APPR AVAILABLE
←ILS02L        2400M
  022          OLN/110.30
←ILS07         3650M
  066          ORE/108.50
←ILS25         3650M
  246          OLO/110.90
<RETURN                 ↑
```

```
    ARRIVAL TO LFPO  ←
 APPR      VIA     STAR
ILS02L     ----    ----
APPR              TRANS
<VIAS              ----
STARS AVAILABLE   TRANS
←BSN1
←BSN2
←EPER
←ERASE          INSERT*
                       ↑
```


APPROACH VIAS
APPR VIA STAR
ILS02L ---- BSN1
APPR AVAILABLE
VIAS
←BSN1
←BSN2
←NO VIA
←ERASE
INSERT*
↑
VIA SELECTION
SLEWING IS POSSIBLE
ARRIVAL TO LFPO
APPR VIA STAR
ILS02L NONE BSNI
APPR TRANS
<VIAS ----
STARS AVAILABLE TRANS
BSN1 CIV→
←BSN2 CMB→
←EPER NO TRANS→
←ERASE INSERT*
TRANS SELECTION
ARRIVAL TO LFPO
APPR VIA STAR
ILS02L NONE BSN1
TRANS
CIV
APPR AVAILABLE
ILS02L 2400M
022 OLN/110.30
←ILS07 3650M
066 ORE/108.50
←ILS25 3650M
246 OLO/110.90
<RETURN ↑
TYPICAL ARRIVAL PAGE WITH SELECTED DATA
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

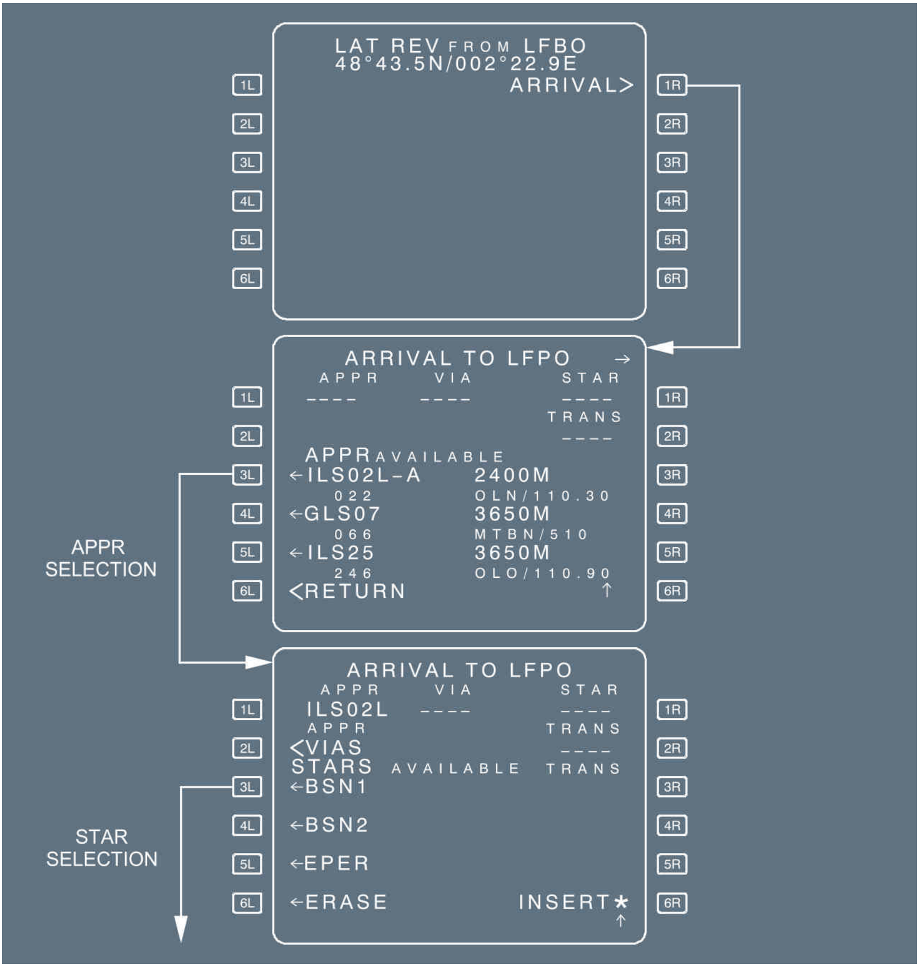
ARRIVAL PAGES

Ident.: DSC-22_20-50-10-25-00006818.0003001 / 12 FEB 13
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

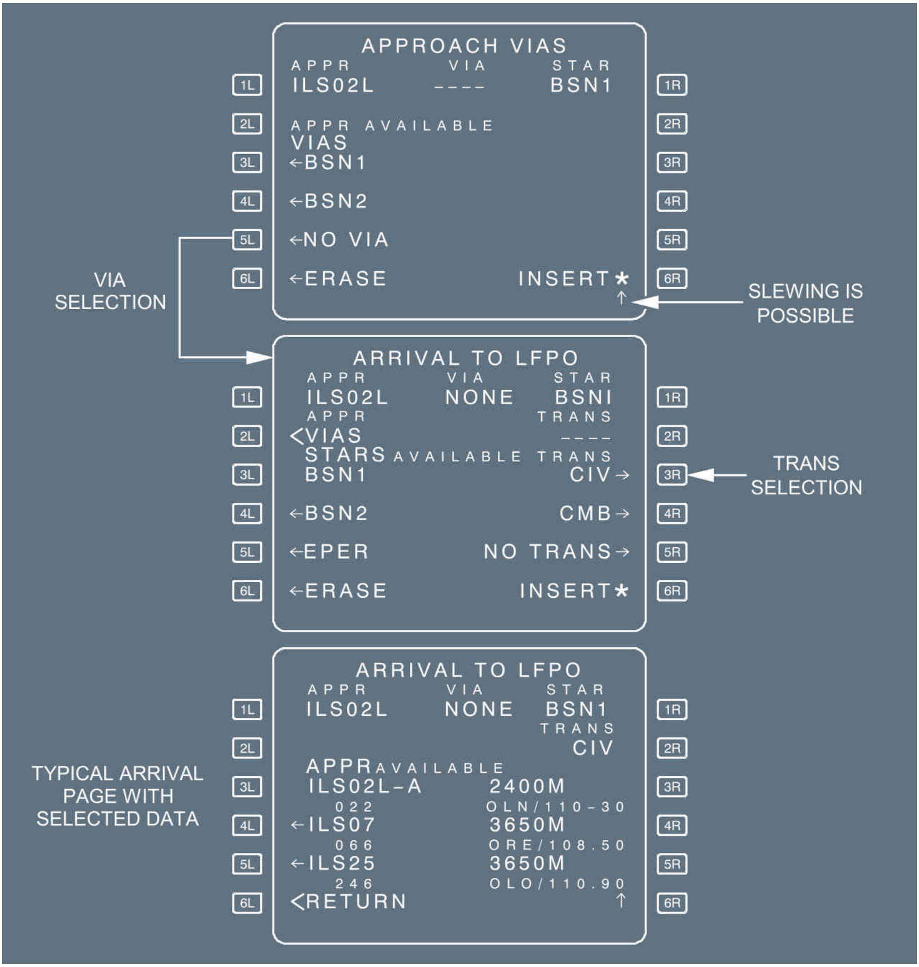
These pages allow the pilot to review arrival procedures (approaches, VIAs, STARs, TRANS) and insert them into the active flight plan.
The pilot calls them up from the LAT REV page for the destination by pressing 1R key.

Three pages, APPR, STAR, and VIA, are available, along with a fourth, TRANS, if there are any transitions.
The pilot calls up each page sequentially either by selecting a data item (such as APPR) or by pressing the [→] key on the MCDU console.

Line [1L] - [1R] [2R]	This line displays the APPR, VIA, STAR, and TRANS in green if they have been inserted in the flight plan, and in yellow, as temporary flight plan, if they have been selected but not yet inserted. It displays dashes or NONE if nothing has been selected or inserted.
[2L] APPR VIAS	The pilot presses this key to call up transitions from the last point of the STAR to first point of the approach.
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can slew the pages, when necessary. Selectable APPRs, STARs, and VIAs are displayed in blue with an arrow. Once the pilot has selected an APPR, STAR, or VIA, the arrow disappears. After the APPR, STAR, or VIA is inserted into the flight plan, it is displayed in green. For each approach the display shows runway length, heading (T if true North referenced), and the frequency and identifier of the ILS or the channel and identifier of the GLS ◁* when ILS or GLS ◁* is available. In case there are multiple approaches for the same runway, the approach is identified with the runway plus the multiple indicator (i.e. ILS 33L-S).
[6L] ERASE or RETURN	The pilot presses this key to erase selected data and revert to the previous selection. The page reverts to the LAT REV page. The field displays “RETURN” instead of ERASE when the flight crew has not created a temporary flight plan.
[3R] to [5R] TRANS	These fields display selectable and selected en route transitions (if any). They are blue when selected, and become green when inserted into the active flight plan.
[6R] INSERT	The pilot presses this key to insert the temporary procedure into the active flight plan. The page reverts to the active flight plan page when this happens.


LAT REV FROM LFBO
48°43.5N/002°22.9E
ARRIVAL>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
ARRIVAL TO LFPO →
APPR VIA STAR
---- ---- ----
TRANS

APPR AVAILABLE
←ILS02L-A 2400M
022 OLN/110.30
←GLS07 3650M
066 MTBN/510
←ILS25 3650M
246 OLO/110.90
<RETURN ↑
APPR
SELECTION
ARRIVAL TO LFPO
APPR VIA STAR
ILS02L ---- ----
APPR TRANS
<VIAS ----
STARS AVAILABLE TRANS
←BSN1
←BSN2
←EPER
←ERASE INSERT*
↑
STAR
SELECTION



```
       APPROACH VIAS
APPR          VIA        STAR
ILS02L        ----       BSN1

APPR AVAILABLE
VIAS
←BSN1

←BSN2

←NO VIA

←ERASE               INSERT*
                           ↑
```

```
       ARRIVAL TO LFPO
 APPR         VIA        STAR
 ILS02L       NONE       BSNI
 APPR                   TRANS
<VIAS                    ----
 STARS AVAILABLE        TRANS
 BSN1                    CIV→
←BSN2                    CMB→
←EPER               NO TRANS→
←ERASE               INSERT*
```

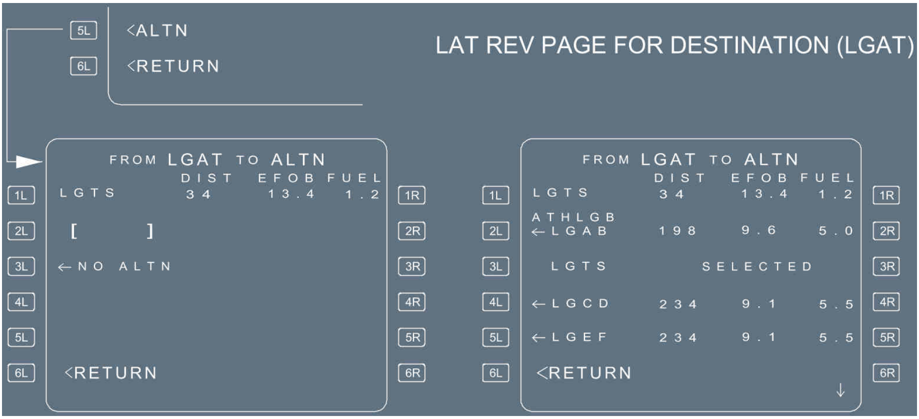
```
       ARRIVAL TO LFPO
 APPR         VIA        STAR
 ILS02L       NONE       BSN1
                        TRANS
                          CIV
 APPR AVAILABLE
 ILS02L-A         2400M
   022            OLN/110-30
←ILS07            3650M
   066            ORE/108.50
←ILS25            3650M
   246            OLO/110.90
<RETURN                     ↑
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
VIA SELECTION
SLEWING IS POSSIBLE
TRANS SELECTION
TYPICAL ARRIVAL PAGE WITH SELECTED DATA

ALTERNATE PAGE

Ident.: DSC-22_20-50-10-25-00006841.0003001 / 09 DEC 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

This page enables the pilot to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. (Alternate airports are linked to the destination). The pilot calls up this page with the ALTN prompt, from the lateral revision page for the destination.



```
      FROM LGAT TO ALTN
                DIST   EFOB FUEL
LGTS             34    13.4  1.2
[        ]
←NO ALTN



<RETURN
```

```
      FROM LGAT TO ALTN
                DIST   EFOB FUEL
LGTS             34    13.4  1.2
ATHLGB
←LGAB           198     9.6  5.0
  LGTS             SELECTED
←LGCD           234     9.1  5.5
←LGEF           234     9.1  5.5
<RETURN
                                ↓
```

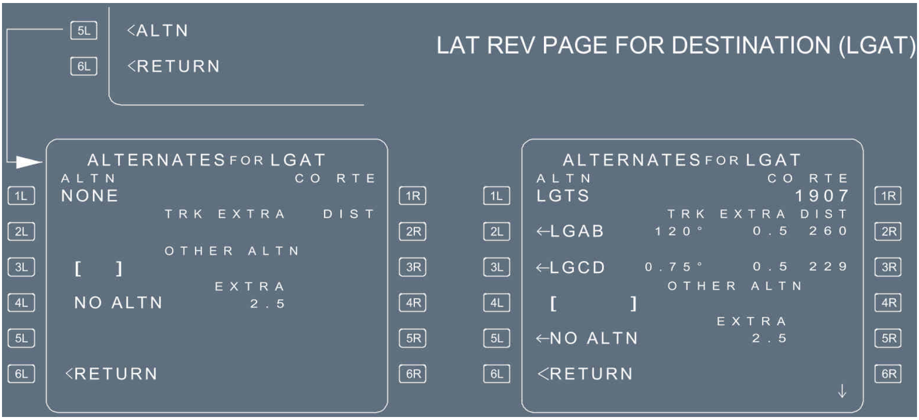
TITLE	The destination airport is displayed in large green font.
[1L] ALTN	This field displays the selected alternate, and its associated data: In green, if it is active ; in yellow, if it is temporary. “NONE” is displayed, if NO ALTN option is selected, or if the destination has no alternate.
Line 2 to line 5	These lines display the identifications of alternates (up to 6), the great-circle distances between the alternates and the destination (not modifiable by the flight crew), the estimated fuel on-board remaining after landing at the alternates and the fuel weight required to reach the alternates (modifiable by the flight crew). If the database contains a company route between the destination and the alternate, the distance shown is an airway distance (not a great-circle distance). When the database defines a preferred alternate, it is displayed on Line 2 (if no scrolling has been performed).
Line 2 to line 5 OTHER ALTN	The pilot can enter up to 3 airport identifiers in the brackets. If that airport is not stored in the database, the NEW RUNWAY page appears for the pilot to use in defining it. If it is stored in the database, the ROUTE SELECTION page appears, and the pilot can use it to select the best route. When the flight crew defines an OTHER ALTN from a company route, the FMS does not compute the associated distance value as long as the flight crew does not insert this OTHER ALTN.

Line 2 to line 5 NO ALTN	The pilot uses this key to select the NO ALTN option.
[6L] RETURN or ERASE	The pilot presses this key to make the display revert to the LAT REV page. Pressing this key erases the temporary selection.
[6R] INSERT	Pressing this key activates the temporary selection.

ALTERNATE PAGE

Ident.: DSC-22_20-50-10-25-00006841.0001001 / 03 NOV 21
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

This page enables the flight crew to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. (Alternate airports are linked to the destination). The flight crew calls up this page with the ALTN prompt, from the lateral revision page for the destination.


5L
6L
<ALTN
<RETURN
LAT REV PAGE FOR DESTINATION (LGAT)
ALTERNATES FOR LGAT
ALTN
CO RTE
NONE
TRK EXTRA DIST
OTHER ALTN
[ ]
EXTRA
NO ALTN
2.5
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
ALTERNATES FOR LGAT
ALTN
CO RTE
LGTS
1907
TRK EXTRA DIST
←LGAB
120°
0.5
260
←LGCD
0.75°
0.5
229
OTHER ALTN
[ ]
EXTRA
←NO ALTN
2.5
<RETURN
↓

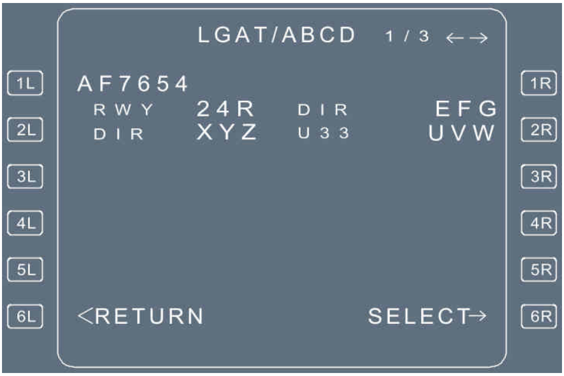
TITLE	The destination airport is displayed in large green font.
[1L] ALTN	This field displays the selected alternate : In green, if it is active ; in yellow, if it is temporary. “NONE” is displayed, if NO ALTN option is selected, or if the destination has no alternate.

Line 2 to line 5	These lines display the identifications of alternates (up to 6), the extra fuel weight remaining after landing at the alternates, and the great-circle track and distances to them from the destination. If the database contains a company route between the destination and the alternate, the distance shown is an airway distance (not a great-circle distance). When the database defines a preferred alternate, it is displayed on Line 2 (if no scrolling has been performed).
[4L] OTHER ALTN	The flight crew can enter an airport identifier in the brackets (Line 3). If that airport is not stored in the database, the NEW RUNWAY page appears for the flight crew to use in defining it. If it is stored in the database, the ROUTE SELECTION page appears, and the flight crew can use it to select the best route. The flight crew may enter a distance in the DIST field of the OTHER ALTN prompt in order to get preliminary fuel predictions. However, once the flight crew has selected the alternate airfield as a temporary alternate and then inserted it, the ALTN distance reverts either to the airway distance if the flight crew has selected a company route, or otherwise to the direct distance to the alternate. The flight crew can use OTHER ALTN to overwrite and replace the previous OTHER ALTN.
NO ALTN	The flight crew uses this key to select the NO ALTN option.
[6L] RETURN or ERASE	The flight crew presses this key to make the display revert to the LAT REV page. Pressing this key erases the temporary selection.
[1R] CO RTE	The flight crew presses this key to display the active company route between the destination and the selected alternate.
[6R] INSERT	Pressing this key activates the temporary selection.

ROUTE SELECTION PAGE FOR ALTERNATE

Ident.: DSC-22_20-50-10-25-00006842.0001001 / 10 DEC 09
Applicable to: ALL

This page allows the pilot to review the company route between the destination and the alternate, and select a different route, if that seems appropriate.
This page comes up automatically when the flight crew enters an ident in the OTHER ALTN field.
See “Route Selection”, page for a description of this page.



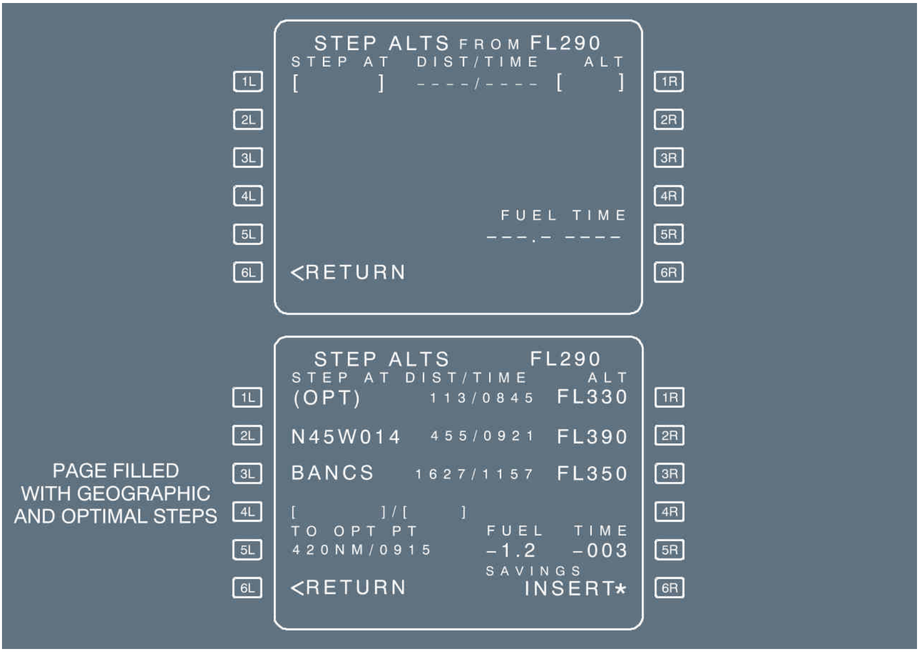
```
         LGAT/ABCD   1/3 ←→
AF7654
 RWY    24R   DIR      EFG
 DIR    XYZ   U33      UVW




<RETURN             SELECT→
```

[6R] SELECT	When the pilot presses this key the display reverts to the alternate page. (The distance between the destination and the alternate is then the airway distance).

STEP ALTS PAGE

Ident.: DSC-22_20-50-10-25-00006848.0001001 / 26 OCT 12
Applicable to: LV-GKO, LV-GKP

This page enables the flight crew to insert up to four geographic step points and one optimal step point into the flight plan. This page also displays the cost savings associated with the optional step. The flight crew either calls it up from the vertical revision page, or from the performance cruise page.


```
 STEP ALTS FROM FL290
STEP AT    DIST/TIME    ALT
[       ]  ----/----  [     ]




                   FUEL TIME
                   ---.- ----
<RETURN
```

PAGE FILLED WITH GEOGRAPHIC AND OPTIMAL STEPS

```
 STEP ALTS          FL290
STEP AT DIST/TIME      ALT
(OPT)       113/0845 FL330
N45W014     455/0921 FL390
BANCS      1627/1157 FL350
[       ]/[     ]
TO OPT PT       FUEL  TIME
420NM/0915      -1.2  -003
                SAVINGS
<RETURN          INSERT*
```

TITLE	STEP ALTS, followed by the current cruise altitude.
Line 1	In this field, the flight crew can either enter a geographic step, or an altitude for an optimal step. *Note: The two formats for a geographic step are:* *- Point/altitude or point/FL* *- Point/distance/altitude or point/distance/FL.*
Line 2 to line 4	STEP AT (large blue font). The flight crew can only enter geographic steps in these fields. Displays the point at which the active step begins. It may be either an active (or secondary) flight plan waypoint, or an inserted optimal point (OPT). *Note: The two formats for a geographic step are:* *- Point/altitude or point/FL* *- Point/distance/altitude or point/distance/FL.*

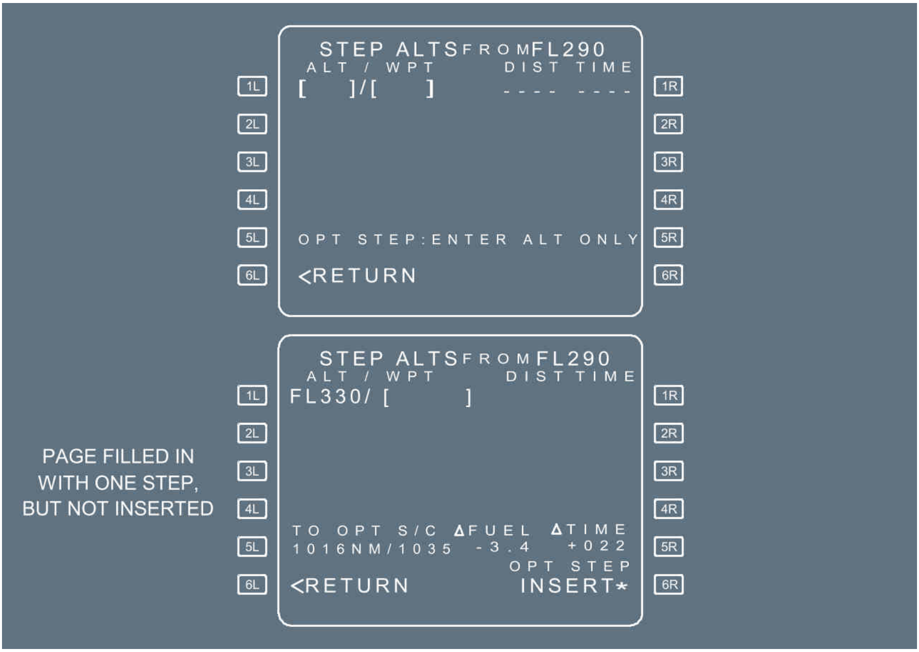
DIST / TIME (UTC) (green small font) :	Displays the distance to go and time from the present aircraft position along the flight plan to the step point.
ALT	Displays the altitude to step to, and allows entry of the optimal step format : FL or ALT. *Note:* *The following messages may be displayed in the DIST / TIME field :* - *ABOVE MAX, if the step altitude exceeds the Max altitude computed by the FMS (Refer to DSC-22_20-10 General).* - *IGNORED, if the step end point is less than 50 NM from the top of descent.* - *STEP NOW, if the aircraft is within 20 NM from the step point.* - *NO OPTIMAL, if an inserted optimal step falls in a discontinuity due to a flight plan change, or if a time constraint exists in the flight plan.*
[5L] TO OPT PT (green small font)	This field displays the distance and time to a non inserted optimal step point if one exists.
[6L] RETURN	The flight crew presses this key to return the display to the previous page. *Note:* *On any flight plan change, an inserted optimal step remains in the flight plan at a fixed distance to destination.*

[5R] SAVINGS	This field displays the fuel and time savings before insertion of the optimal step point. Fuel savings are displayed in thousand of kilograms (or pounds) (maxi 99.9). The value is preceded by : "–" in case of fuel saving, "+" in case of additional fuel cost. Time savings are displayed in hours and minutes. The value is preceded by "–" in case of time saving, "+" in case of additional time cost. _Note:_ *If no optimal step point exists for the altitude displayed in [1R], the "NO OPTIMAL" message is displayed in the FUEL / TIME field. This message is also displayed if the optimal step falls into a discontinuity.*
[6R] INSERT (amber)	This field displays INSERT when an optimal step point exists but is not yet inserted. When INSERT is selected : - the optimal step point is inserted into the flight plan. - OPT is displayed in line 1L. - optimal step distance and time are deleted in line 5L. - the * UPDATE blue prompt replaces the INSERT prompt.
UPDATE	This prompt allows to compute another optimal step point. The UPDATE prompt is then replaced by the *INSERT prompt.

STEP ALTS PAGE

Ident.: DSC-22_20-50-10-25-00006848.0003001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

This page enables the flight crew to insert up to four geographic step points and one optimal step point into the flight plan. This page also displays the time/fuel savings associated with the optimal step.
The flight crew calls the STEP ALTS page up either from the vertical revision page, or from the PERF Cruise page when the FMS flight phase is Cruise.



```
    STEP ALTS FROM FL290
  ALT / WPT          DIST TIME
[    ]/[     ]       ----  ----




OPT STEP:ENTER ALT ONLY
<RETURN
```

```
    STEP ALTS FROM FL290
  ALT / WPT          DIST TIME
FL330/ [        ]




TO OPT S/C  ΔFUEL  ΔTIME
1016NM/1035  -3.4   +022
                 OPT STEP
<RETURN          INSERT*
```

PAGE FILLED IN WITH ONE STEP, BUT NOT INSERTED

TITLE [1L] – [1R] [4L] – [4R]	STEP ALTS followed by the current cruise altitude.
ALT/WPT (blue)	The waypoint identifier, as well as the altitude to step, can be entered in this field. Both are displayed in large font. The waypoint may either be an active (or secondary) flight plan waypoint, or an inserted optimal point (OPT). When an entry is made, a temporary F-PLN is created.

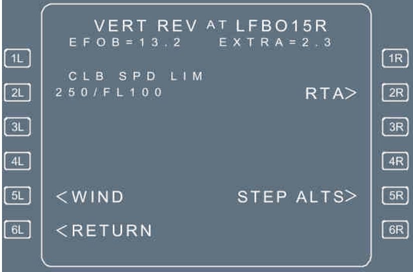
DIST/TIME (UTC) (small green font)	Displays the distance to go, and time from the present aircraft position along the flight plan to the step point. *Note: The following messages may be displayed in the DIST/TIME field:* - *"ABOVE MAX", if the step altitude exceeds the MAX altitude.* - *"IGNORED", if the end step point is less than 50 NM from the top of descent or if the step climb is located prior to the top of climb or after the top of descent.* - *"STEP AHEAD", when the aircraft is within 20 NM of the start step point.* - *"NO OPTIMAL", if a non inserted optimal step falls in a discontinuity due to a flight plan change, or when no new optimal exist after an UPDATE or when no optimal step point exists for the entered altitude.* *Note: If no optimal step point exists for the altitude displayed in [1L], the "NO OPTIMAL" message is displayed in the FUEL/TIME field. This message is also displayed if the optimal step falls into a discontinuity.*
[5L] OPT STEP : ENTER ONLY ALT (white) TO OPT S/C (green small front)	This fields displays the distance and time to an uninserted optimal step point, if one exists. It is displayed to guide the flight crew for the entry format of an optimal step. *Note: On any flight plan change, an inserted optimal step remains in the flight plan at a fixed distance to destination.*
[6L] RETURN	The flight crew presses this key to return to the previous page.
[5R] SAVINGS	This field displays the fuel and time savings prior to the insertion of the optimal step point. Fuel savings are displayed in thousands of kilograms (or pounds) (maxi 99.9). The value is preceded by: "-" in case of fuel saving, "+" in case of additional fuel cost. Time savings are displayed in hours and minutes. The value is preceded by: "-" in case of time saving, "+" in case of additional time cost.

[6R] INSERT* (amber)	This field displays INSERT*, when an optimal step point exists but is not yet inserted. When INSERT is selected: - The optimal step point is inserted into the flight plan. - OPT is displayed in line 1L. - Optimal step distance and time are deleted in line 5L. - The UPDATE* blue prompt replaces the INSERT* prompt.
UPDATE*	This prompt enables the computation of another optimal step point. The UPDATE* prompt is then replaced by the INSERT* prompt.

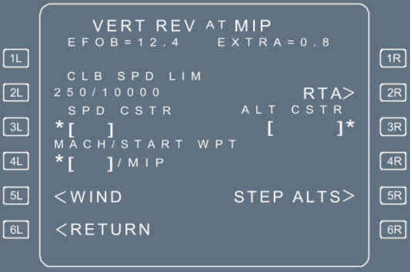
VERTICAL REVISION PAGES

Ident.: DSC-22_20-50-10-25-00006845.0001001 / 21 NOV 11
Applicable to: ALL

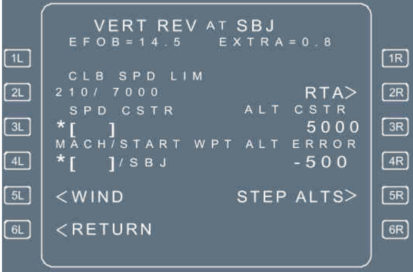
These pages contain the menu of available vertical flight plan revisions that can be applied at a selected waypoint.
The pilot calls up these pages from the flight plan A or B pages by pressing the right hand key next to the selected revised waypoint.
The pilot may make several different vertical revisions (although some may not be available at all waypoints): speed limit, speed constraint, altitude constraint, time constraint, wind page and STEP ALTS page.


VERT REV AT LFBO15R
EFOB=13.2 EXTRA=2.3
CLB SPD LIM
250/FL100
RTA>
<WIND
STEP ALTS>
<RETURN
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

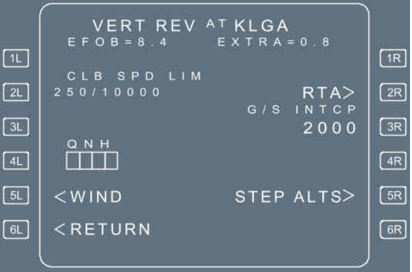
VERT REV AT ORIGIN


VERT REV AT MIP
EFOB=12.4 EXTRA=0.8
CLB SPD LIM
250/10000
RTA>
SPD CSTR
ALT CSTR
*[ ]
[ ]*
MACH/START WPT
*[ ]/MIP
<WIND
STEP ALTS>
<RETURN
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

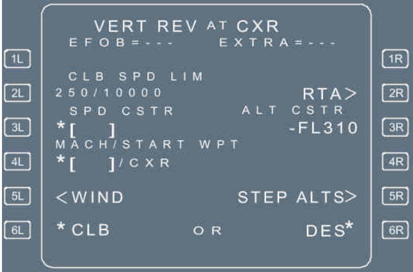
VERT REV AT CRUISE WPT


VERT REV AT SBJ
EFOB=14.5 EXTRA=0.8
CLB SPD LIM
210/ 7000
RTA>
SPD CSTR
ALT CSTR
*[ ]
5000
MACH/START WPT
ALT ERROR
*[ ]/SBJ
-500
<WIND
STEP ALTS>
<RETURN
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

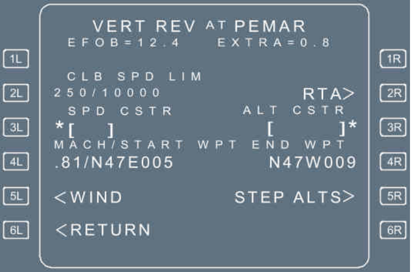
VERT REV AT WPT IN CLIMB.
(ALT CSTR ENTERED AND
PREDICTED MISSED)


VERT REV AT KLGA
EFOB=8.4 EXTRA=0.8
CLB SPD LIM
250/10000
RTA>
G/S INTCP
2000
QNH
<WIND
STEP ALTS>
<RETURN
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

VERT REV AT DEST


VERT REV AT CXR
EFOB=--- EXTRA=---
CLB SPD LIM
250/10000
RTA>
SPD CSTR
ALT CSTR
*[ ]
-FL310
MACH/START WPT
*[ ]/CXR
<WIND
STEP ALTS>
*CLB
OR
DES*
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

VERT REV AT WPT
(PREDICTIONS NOT AVAILABLE)


VERT REV AT PEMAR
EFOB=12.4 EXTRA=0.8
CLB SPD LIM
250/10000
RTA>
SPD CSTR
ALT CSTR
*[ ]
[ ]*
MACH/START WPT
END WPT
.81/N47E005
N47W009
<WIND
STEP ALTS>
<RETURN
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

VERT REV WITH CONSTANT MACH SEGMENT
DEFINED BETWEEN N47E005 AND N47W009
(BOTH WAYPOINTS ARE IN CRZ PHASE)

TITLE (white)	“VERT REV AT [location]” (Second line shows remaining fuel and extra fuel at the revise waypoint.

[1L] "TOO STEEP PATH BEYOND" (amber)	This message is displayed if the waypoint is part of a leg with too steep a descent path.
[2L] CLB/DES SPD LIM (magenta)	This field displays the speed limit applicable to the climb or descent phase. It displays it in a large font when data has been inserted manually and in a small font when data comes from the database.
[3L] SPD CSTR (magenta)	This field displays any speed constraint assigned to the revised waypoint. It is in a large font when inserted manually, and in a small font when it comes from the database. It is not displayed at the origin airport, a FROM waypoint, a speed limit pseudo waypoint, or the destination airport.
[4L] QNH	This field functions only when the revised waypoint is the primary destination. It allows the pilot to enter the sea-level atmospheric pressure. This field is identical to the QNH field of the PERF APPR page.
[4L] MACH/START WPT (blue)	This prompt allows the pilot to enter or modify the start point of a constant Mach segment, and its associated Mach. This prompt is not displayed at primary destination and alternate flight plan waypoints. (*Refer to DSC-22_20-30-20-05 General*)
[5L] WIND (blue)	The pilot presses this key to access to the wind pages. The first wind page that is displayed, corresponds to the selected waypoint e.g. climb page if the selected waypoint is a climb phase waypoint. A CLR action reverts it to brackets.
[6L] RETURN or CLB	The pilot presses this key to return to the last displayed flight plan page. When displayed pressing this key assigns the constraint to CLB phase and inserts it into the vertical flight plan. The page reverts to the flight plan page.
[2R] RTA prompt	This prompt gives access to the RTA page. It is not displayed when the VERT REV page is accessed from the alternate F-PLN.

[3R] ALT CSTR (magenta)	This field displays the altitude constraint assigned to this revised waypoint. It uses a large font when the constraint is entered manually, a small font when it is from the database. A CLR action reverts it to brackets. The constraint may be : • “At”, entered as XXXXX (FL 180, for example) • “At or above”, entered as + XXXXX or XXXXX + (+ FL 310, for example) • “At or below”, entered as – XXXXX or XXXXX – (– 5000, for example) • A “window” constraint. The altitude window consists of two altitudes between which the aircraft should fly. The crew cannot manually enter a “window” constraint.
G/S INTCP (green)	This field displays the glide intercept altitude for an ILS approach on the vertical revision page at destination.
[4R] ALT ERROR (green)	When the aircraft misses a predicted altitude constraint, this field displays the difference between the altitude constraint and the predicted altitude. If, for example, “– 500” appears in this field in green, the aircraft will reach the waypoint at an altitude 500 ft below the constraint altitude. This applies only to waypoints in the climb and descent phases.
[4R] END WPT (blue)	This prompt allows the pilot to enter or modify the endpoint of a constant Mach segment. It is displayed when a pair Mach/start exists in 4L field. This prompt is not displayed on the destination VERT REV page. (*Refer to DSC-22_20-30-20-05 General*).
[5R] STEP ALTS (white)	This legend appears for any waypoint once a cruise altitude has been entered. It is not available in engine-out, descent, approach and go-around phases. This gives the pilot access to the step altitudes page.

[6R] DES	When this field displays “DES”, pressing this key assigns the constraints to the descent phase and inserts them into the vertical flight plan. The page reverts to the F-PLN page. (See Note, below).

Note: *Altitude and speed constraints may apply to climb, descent or approach phase, but never to cruise phase. Fields 6L/6R display “CLB/DES” when the revised waypoint is a cruise phase waypoint and the FMGES needs to know if the new constraint is to be applied in climb or descent phase. The FMGES will modify the cruise phase accordingly. These 2 prompts also display “CLB/DES” when the predictions are not computed. (top of climb and top of descent not yet defined).*

DATA INDEX PAGES

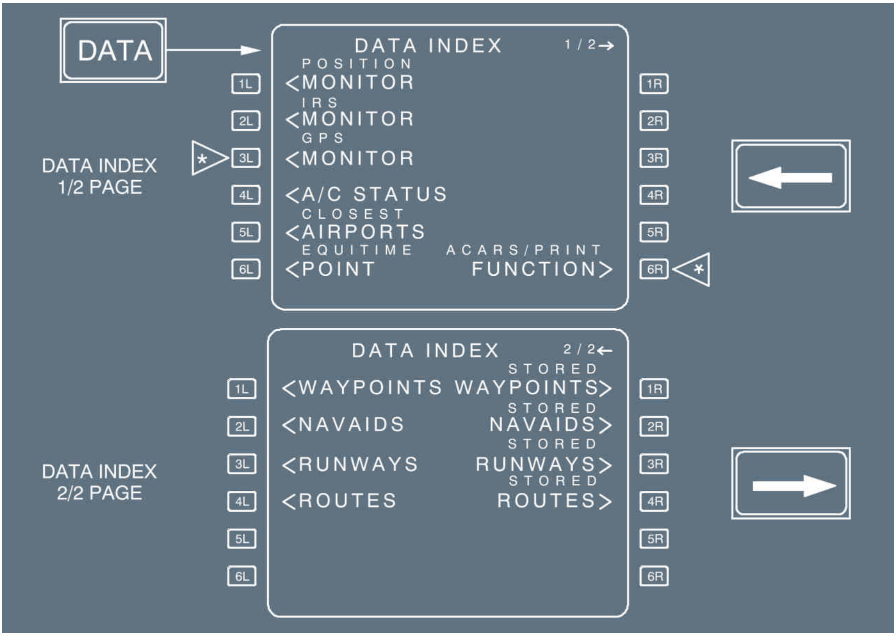
Applicable to: ALL

Ident.: DSC-22_20-50-10-25-D-00006852.0001001 / 14 MAY 12

GENERAL

There are two INDEX pages:
- The DATA INDEX 1/2 page gives access to various pages devoted to navigation.
- The DATA INDEX 2/2 page lists the navigation data entered in the FMGES.

The pilot enters those items labeled “stored” and can modify them. The pilot can call up the others, but cannot modify them.
The pilot calls up these pages by pressing the DATA key on the MCDU console:


DATA
DATA INDEX 1/2 PAGE
DATA INDEX 1/2→
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR
<A/C STATUS
CLOSEST
<AIRPORTS
EQUITIME
<POINT
ACARS/PRINT
FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
DATA INDEX 2/2 PAGE
DATA INDEX 2/2←
<WAYPOINTS
STORED
WAYPOINTS>
<NAVAIDS
STORED
NAVAIDS>
<RUNWAYS
STORED
RUNWAYS>
<ROUTES
STORED
ROUTES>

Ident.: DSC-22_20-50-10-25-D-00006861.0001001 / 10 DEC 09

DATA INDEX 1/2 PAGE

[1L] POSITION MONITOR - [2L] IRS MONITOR	When the flight crew presses these keys, the display shows all essential navigation data.
[3L] GPS MONITOR ◁*	This key calls up the GPS MONITOR page.
[4L] A/C STATUS	This key calls up the aircraft status page.
[5L] CLOSEST AIRPORTS.	This key calls up the closest airports page.
[6L] EQUITIME POINT	This key calls up the equitime point page.
[6R] ACARS/PRINT ◁*	This key calls up the PRINT function pages and the ACARS function pages.

Ident.: DSC-22_20-50-10-25-D-00006866.0001001 / 10 DEC 09

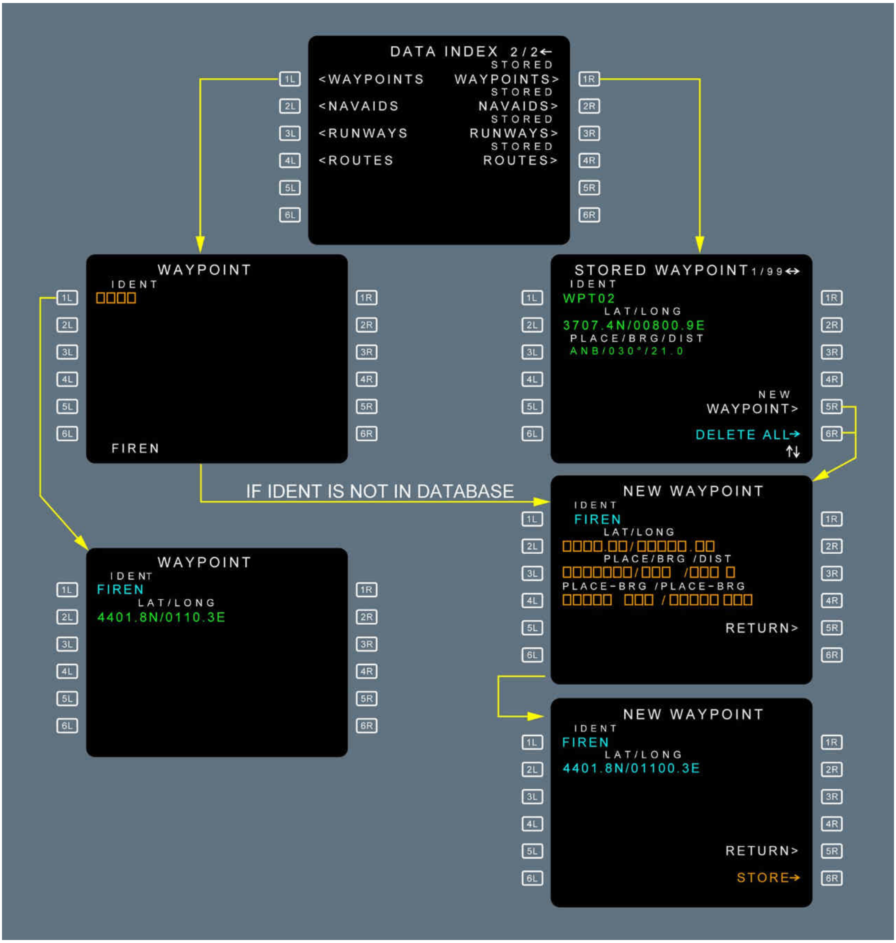
DATA INDEX 2/2 PAGE

[1L] WAYPOINTS - [2L] NAVAIDS - [3L] RUNWAYS - [4L] ROUTES	These keys call up descriptions of waypoints, navaids, runways, and routes stored in the database so that the pilot can review it.
[1R] STORED WAYPOINTS - [2R] STORED NAVAIDS - [3R] STORED RUNWAYS - [4R] STORED ROUTES	These keys call up waypoints, navaids, runways, and routes that the pilot has stored, allowing the pilot to review them and to store them in or delete them from the database. They are erased automatically in the done phase when a specific pin program is activated.

WAYPOINT/STORED WAYPOINT/NEW WAYPOINT PAGES

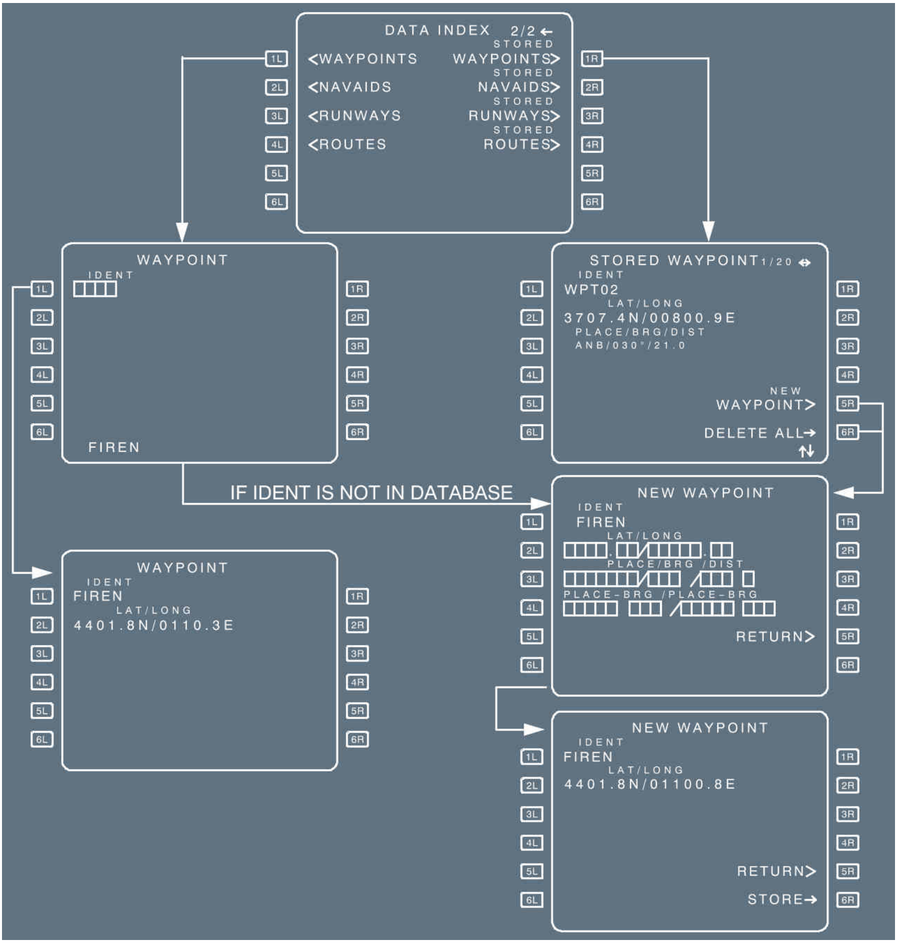
Ident.: DSC-22_20-50-10-25-E-00006883.0003001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

SCHEMATIC


DATA INDEX 2/2←
<WAYPOINTS
STORED WAYPOINTS>
<NAVAIDS
STORED NAVAIDS>
<RUNWAYS
STORED RUNWAYS>
<ROUTES
STORED ROUTES>
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
WAYPOINT
IDENT
□□□□
FIREN
STORED WAYPOINT 1/99↔
IDENT
WPT02
LAT/LONG
3707.4N/00800.9E
PLACE/BRG/DIST
ANB/030°/21.0
NEW WAYPOINT>
DELETE ALL→
↑↓
IF IDENT IS NOT IN DATABASE
WAYPOINT
IDENT
FIREN
LAT/LONG
4401.8N/0110.3E
NEW WAYPOINT
IDENT
FIREN
LAT/LONG
□□□□.□□/□□□□□.□□
PLACE/BRG /DIST
□□□□□□□/□□□ /□□□ □
PLACE-BRG /PLACE-BRG
□□□□□ □□□ /□□□□□ □□□
RETURN>
NEW WAYPOINT
IDENT
FIREN
LAT/LONG
4401.8N/01100.3E
RETURN>
STORE→

Ident.: DSC-22_20-50-10-25-E-00006883.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

SCHEMATIC


DATA INDEX 2/2 ←
<WAYPOINTS
STORED WAYPOINTS>
<NAVAIDS
STORED NAVAIDS>
<RUNWAYS
STORED RUNWAYS>
<ROUTES
STORED ROUTES>
WAYPOINT
IDENT
FIREN
STORED WAYPOINT 1/20 ↔
IDENT
WPT02
LAT/LONG
3707.4N/00800.9E
PLACE/BRG/DIST
ANB/030°/21.0
NEW WAYPOINT>
DELETE ALL→
↑↓
IF IDENT IS NOT IN DATABASE
NEW WAYPOINT
IDENT
FIREN
LAT/LONG
PLACE/BRG /DIST
PLACE-BRG /PLACE-BRG
RETURN>
WAYPOINT
IDENT
FIREN
LAT/LONG
4401.8N/0110.3E
NEW WAYPOINT
IDENT
FIREN
LAT/LONG
4401.8N/01100.8E
RETURN>
STORE→
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Ident.: DSC-22_20-50-10-25-E-00006889.0001001 / 10 DEC 09
Applicable to: ALL

WAYPOINT PAGE

- The pilot can call up this page by pressing the 1L key when the data index page is on display. The display then shows waypoint information associated with the identifier the flight crew inserts in the [1L] field.
- It is possible to call up by this page any waypoint not stored in the stored waypoint list if they belong to the active, temporary or secondary flight plan.

Ident.: DSC-22_20-50-10-25-E-00006891.0003001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

STORED WAYPOINT PAGE

The flight crew calls up this page by pressing the [1R] when the DATA INDEX page is on display. This page displays waypoints that the flight crew has defined and stored. It lists each stored waypoint along with a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper right corner of the page. For example, 1/99 indicates that the waypoint was the first of 99 stored.

Note: *LAT/LONG crossing points and Abeam/Radial Intercept points are never included in the stored waypoint list.*

[1L] IDENT	To delete a waypoint, the flight crew clears the [1L] IDENT display.
[3L]	PLACE/BEARING/DISTANCE.
[4L]	PLACE-BEARING/PLACE-BEARING.
[5R] NEW WAYPOINT	The flight crew presses this key to call up the NEW WAYPOINT page.
[6R] DELETE ALL	The flight crew presses this key and the label changes to CONFIRM DELETE ALL. Pressing a second time this key deletes all the waypoints stored by the flight crew except those currently in use in the active or secondary flight plan (F-PLN ELEMENT RETAINED appears on the MCDU).

Ident.: DSC-22_20-50-10-25-E-00006891.0001001 / 18 MAR 11
Applicable to: LV-GKO, LV-GKP

STORED WAYPOINT PAGE

The pilot calls up this page by pressing the 1R key when the data index page is on display. This page displays waypoints that the pilot has defined and stored. It lists each stored waypoint along with a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper righthand corner of the page. For example, “1/20” indicates that the waypoint was the first of 20 stored.

Note: *Lat/long crossing points and Abeam/Radial Intercept points are never included in the stored waypoint list.*

[1L] IDENT	To delete a waypoint, the pilot clears the 1L ident display.
[3L]	PLACE/BEARING/DISTANCE and
[4L]	PLACE-BEARING/PLACE-BEARING
[5R] NEW WAYPOINT	The pilot presses this key to call up the NEW WAYPOINT page.
[6R] DELETE ALL	The pilot presses this key and the label changes to amber CONFIRM DELETE ALL. Pressing a second time this key deletes all the waypoints stored by the flight crew except those currently in use in the active or secondary flight plan. ("F-PLN ELEMENT RETAINED" appears on the MCDU).

Ident.: DSC-22_20-50-10-25-E-00006942.0003001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

NEW WAYPOINT PAGE

- The flight crew calls up this page by pressing the [5R] when the STORED WAYPOINT page is on display.
- The flight crew can use this page to define and store up to 99 waypoints. Entering an additional waypoint deletes the first one.
  The flight crew defines a waypoint by entering its IDENT in the data field next to [1L], then entering its position in the amber boxes.
  A "T" may be added if the bearing has been defined using the true North reference e.g. N42E002/015 °T/120.0 or WPT 01. 030 °T/WPT02-125 °T.
  The STORE prompt appears next to [6R] when the boxes are filled, and the flight crew presses the key to store the waypoint in the database.
  If the flight crew enters the waypoint's position as place/bearing/distance or place-bearing/place-bearing, the FMGEC computes its latitude and longitude.

Ident.: DSC-22_20-50-10-25-E-00006942.0001001 / 18 MAR 11
Applicable to: LV-GKO, LV-GKP

NEW WAYPOINT PAGE

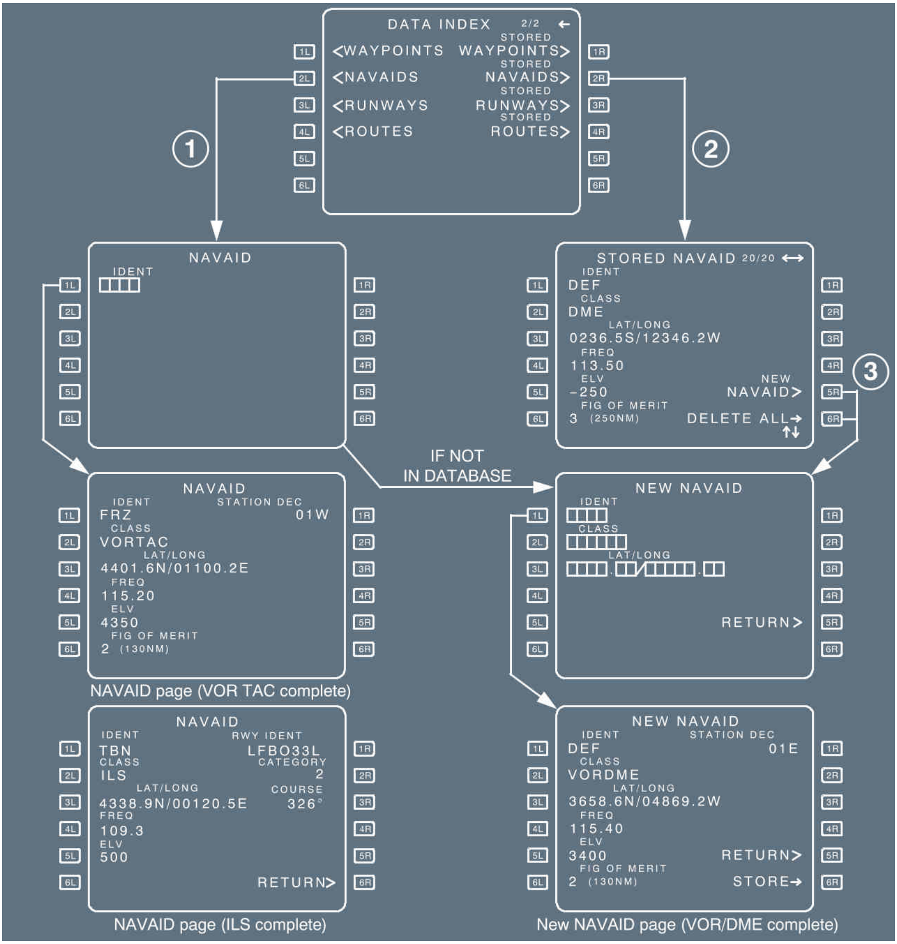
- The pilot calls up this page by pressing the 5R key when the STORED WAYPOINT page is on display.
- The pilot can use this page to define and store up to 20 waypoints. Entering an additional waypoint deletes the first one.
  The pilot defines a waypoint by entering its ident in the data field next to 1L, then entering its position in the amber boxes.
  A “T” may be added if the bearing has been defined using the true North reference e.g. N42E002/015 °T/120.0 or WPT 01. 030 °T/WPT02-125 °T.
  The STORE prompt appears next to 6R when the boxes are filled, and the pilot presses the key to store the waypoint in the database.
  If the pilot enters the waypoint’s position as place/bearing/distance or place-bearing/place-bearing, the FMGEC computes its latitude and longitude.

NAVAID/STORED NAVAID/NEW NAVAID PAGES

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-F-00006916.0001001 / 01 OCT 12

GENERAL



DATA INDEX 2/2 ←
<WAYPOINTS STORED WAYPOINTS>
<NAVAIDS STORED NAVAIDS>
<RUNWAYS STORED RUNWAYS>
<ROUTES STORED ROUTES>

NAVAID
IDENT
☐☐☐☐

STORED NAVAID 20/20 ↔
IDENT
DEF
CLASS
DME
LAT/LONG
0236.5S/12346.2W
FREQ
113.50
ELV
-250
NEW NAVAID>
FIG OF MERIT
3 (250NM)
DELETE ALL→
↑↓

NAVAID
IDENT FRZ
STATION DEC 01W
CLASS VORTAC
LAT/LONG 4401.6N/01100.2E
FREQ 115.20
ELV 4350
FIG OF MERIT 2 (130NM)

NAVAID page (VOR TAC complete)

NEW NAVAID
IDENT ☐☐☐☐
CLASS ☐☐☐☐☐☐
LAT/LONG ☐☐☐☐.☐☐/☐☐☐☐☐.☐☐
RETURN>

NAVAID
IDENT TBN
RWY IDENT LFBO33L
CLASS ILS
CATEGORY 2
LAT/LONG 4338.9N/00120.5E
COURSE 326°
FREQ 109.3
ELV 500
RETURN>

NAVAID page (ILS complete)

NEW NAVAID
IDENT DEF
STATION DEC 01E
CLASS VORDME
LAT/LONG 3658.6N/04869.2W
FREQ 115.40
ELV 3400
RETURN>
FIG OF MERIT 2 (130NM)
STORE→

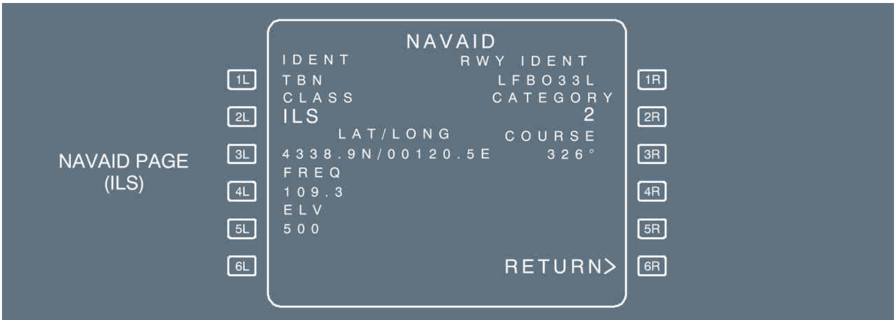
New NAVAID page (VOR/DME complete)

Ident.: DSC-22_20-50-10-25-F-00006920.0001001 / 12 FEB 13

NAVAID PAGE

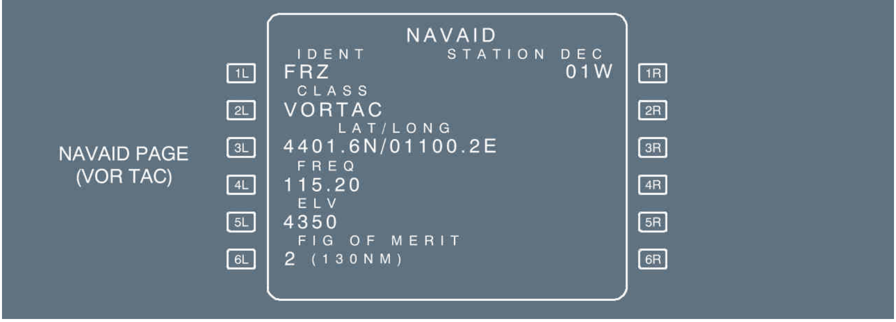
The pilot calls up this page by pressing the 2L key on the data index page.
This page displays navaid information associated with the identifier the pilot inserts in the [1L] field.

NAVAID PAGE (ILS)



NAVAID
IDENT RWY IDENT
TBN LFBO33L
CLASS CATEGORY
ILS 2
LAT/LONG COURSE
4338.9N/00120.5E 326°
FREQ
109.3
ELV
500
RETURN>

NAVAID PAGE (VOR TAC)



NAVAID
IDENT STATION DEC
FRZ 01W
CLASS
VORTAC
LAT/LONG
4401.6N/01100.2E
FREQ
115.20
ELV
4350
FIG OF MERIT
2 (130NM)

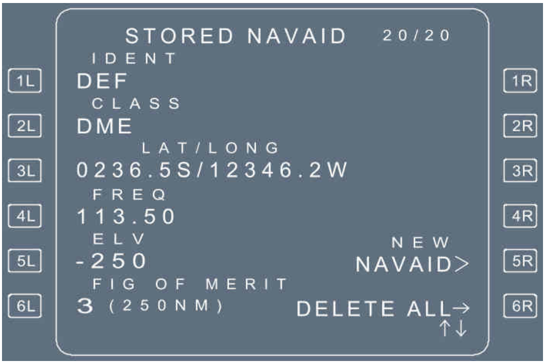
[2L] CLASS	This field identifies the navaid as VOR, DME, VOR DME, VORTAC, NDB, LOC, ILS, GLS ⊲ , ILS/DME, ILS/TAC or TACAN. The field displays NON COLLOCATED if the navaid is non collocated.
[3L] LAT/LONG	If an uncollocated VOR DME or VORTAC is displayed, the LAT/LONG is the VOR latitude and longitude. The LAT/LONG displayed for an ILS, ILS/DME, ILS/TAC is the LAT/LONG of the localizer.
[4L] FREQ or CHAN	CHAN is displayed if the class of the navaid is an MLS or a GLS ⊲ .
[5L] ELV	This field gives the elevation of the navaid in feet above sea level. It is not displayed for VOR or NDB.

[6L] FIG OF MERIT	This field shows how far out the FMGES can autotune a VOR, VOR/DME, VORTAC or DME for display or for computing position. 0 : up to 40 NM 1 : up to 70 NM 2 : up to 130 NM 3 : up to 250 NM
[1R] STATION DEC or RWY IDENT	This is the magnetic declination in the navaid area (used only for VOR, VOR/DME, and VORTAC). The field displays RWY IDENT if the navaid is a LOC, ILS, GLS ◁ , ILS/DME or ILS/TAC.
[2R] CATEGORY	This field shows the navaid's category if it is an ILS, ILS/DME, GLS ◁ or ILS/TAC. A LOC DME has a category = 0.
[3R] COURSE	This is the localizer course if the navaid is an LOC, ILS, GLS ◁ , ILS/DME or ILS/TAC. A "T" is added if the course is true referenced.
[6R] RETURN	This prompt is displayed if the page has been accessed from the SELECTED NAVAID page. The pilot presses this key to return to the SELECTED NAVAID page.

Ident.: DSC-22_20-50-10-25-F-00006935.0001001 / 03 NOV 21

STORED NAVAID PAGE

The flight crew calls up this page by pressing the 2R key on the data index page. The flight crew uses this page to display or delete navaids that has defined and stored.



```
        STORED NAVAID      20/20
   IDENT
DEF
   CLASS
DME
         LAT/LONG
0236.5S/12346.2W
   FREQ
113.50
   ELV                      NEW
-250                    NAVAID>
   FIG OF MERIT
3 (250NM)           DELETE ALL→
                             ↑↓
```

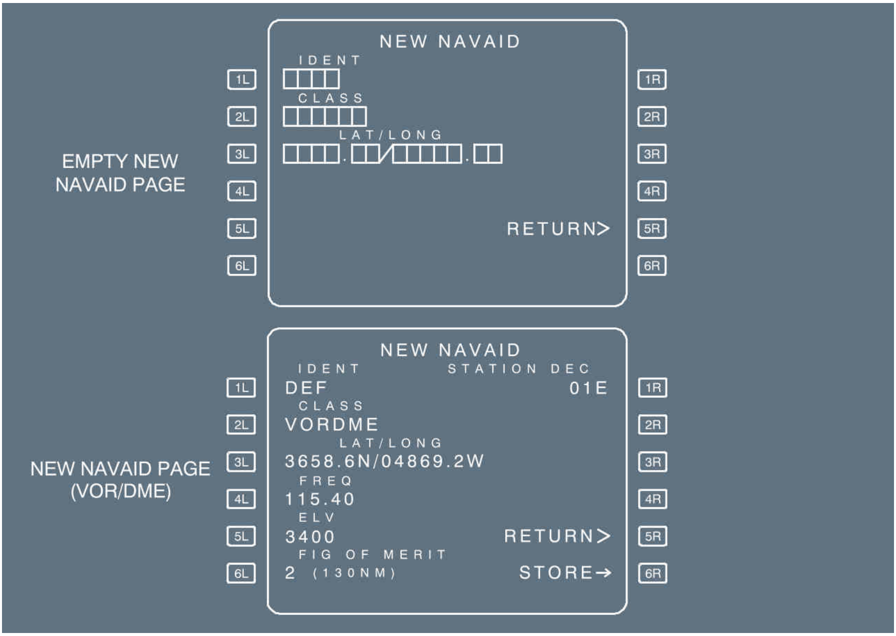
A number in the upper right hand corner of the screen shows the relative order in which the navaids were stored. (For example, 3/7 means third out of seven stored).
Slew keys give the flight crew access to the different stored navaids.

[1L] IDENT	The flight crew deletes a stored navaid by entering its ident in this field, then pressing the CLR key at the bottom of the MCDU control panel.
[6R] DELETE ALL and CONFIRM DELETE ALL	The flight crew presses this key to erase all the stored navaids except those currently in use in the active or secondary flight plan. (The MCDU displays “F-PLN ELEMENT RETAINED.”).

Ident.: DSC-22_20-50-10-25-F-00006937.0001001 / 12 FEB 13

NEW NAVAID PAGE

The pilot calls up this page by pressing the 5R key on the stored navaid page.


EMPTY NEW NAVAID PAGE
NEW NAVAID
IDENT
CLASS
LAT/LONG
RETURN>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
NEW NAVAID PAGE (VOR/DME)
NEW NAVAID
IDENT
DEF
STATION DEC
01E
CLASS
VORDME
LAT/LONG
3658.6N/04869.2W
FREQ
115.40
ELV
3400
RETURN>
FIG OF MERIT
2 (130NM)
STORE→

The pilot can use it to define and store up to 20 navaids. He must enter the navaid elements in two steps :

1. Enter the data in the lines of amber boxes.
2. Enter frequency, elevation, figure of merit, and station declination or ILS category and course, if applicable.

Note: *The pilot cannot create an ILS/DME or a non-colocated navaid. If the runway associated with the ILS or GLS has been entered through the new runway page, the course, ident, and runway ident are already displayed on the new navaid page when it comes up (copied from the new runway page). (Refer to DSC-22_20-50-10-25 RUNWAYS/STORED RUNWAYS/NEW RUNWAY Pages - NEW RUNWAY Page, for details).*

[1R] STATION DEC	The pilot must enter the magnetic declination if the prompt is displayed. This prompt is displayed only for VOR, VORTAC or VOR/DME. For a true referenced station, (polar area), enter OT or TO.
[3R] COURSE	If the navaid is an ILS, GLS , LOC, enter the course. Add a “T” for true reference e.g. 120 °T.
[6R] STORE	This prompt appears when all the amber boxes are filled. The pilot presses the key to store the navaid.

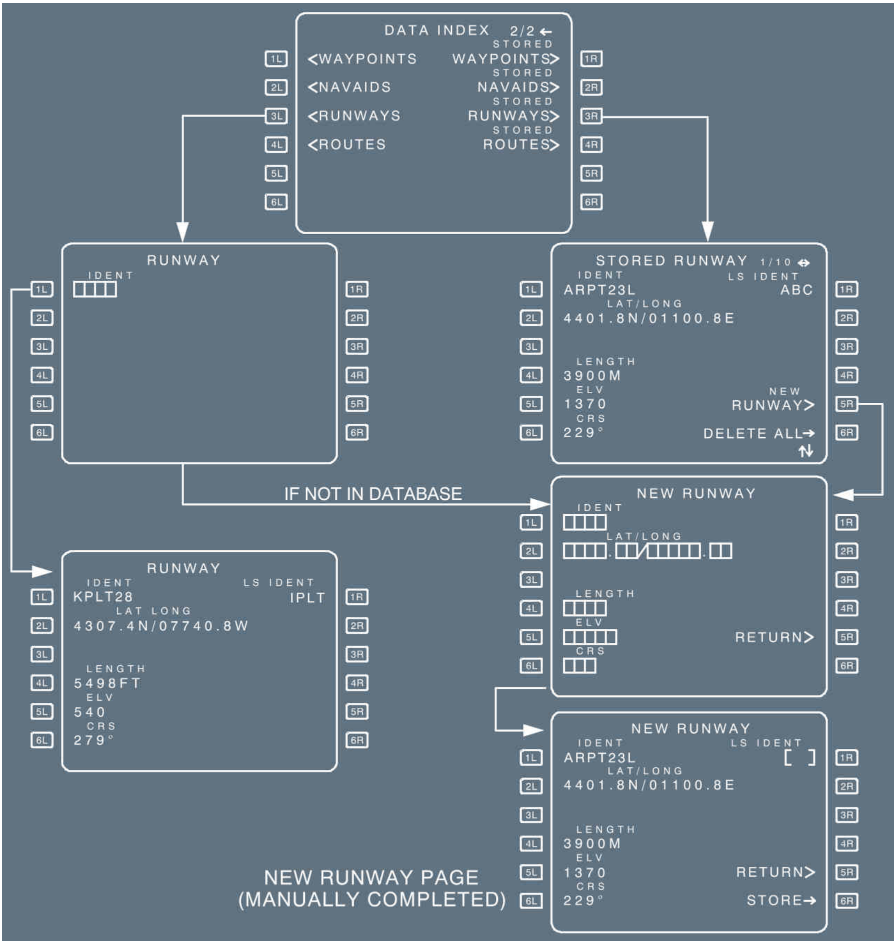
A stored navaid is never used for position computation.

RUNWAYS/STORED RUNWAYS/NEW RUNWAY PAGES

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-G-00006938.0001001 / 14 MAY 12

SCHEMATIC


DATA INDEX 2/2 ←
<WAYPOINTS
STORED WAYPOINTS>
<NAVAIDS
STORED NAVAIDS>
<RUNWAYS
STORED RUNWAYS>
<ROUTES
STORED ROUTES>
RUNWAY
IDENT
STORED RUNWAY 1/10 ↔
IDENT ARPT23L
LS IDENT ABC
LAT/LONG 4401.8N/01100.8E
LENGTH 3900M
ELV 1370
CRS 229°
NEW RUNWAY>
DELETE ALL→
IF NOT IN DATABASE
NEW RUNWAY
IDENT
LAT/LONG
LENGTH
ELV
CRS
RETURN>
RUNWAY
IDENT KPLT28
LS IDENT IPLT
LAT LONG 4307.4N/07740.8W
LENGTH 5498FT
ELV 540
CRS 279°
NEW RUNWAY
IDENT ARPT23L
LS IDENT [ ]
LAT/LONG 4401.8N/01100.8E
LENGTH 3900M
ELV 1370
CRS 229°
RETURN>
STORE→
NEW RUNWAY PAGE
(MANUALLY COMPLETED)
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Ident.: DSC-22_20-50-10-25-G-00006939.0001001 / 12 FEB 13

RUNWAY PAGE

This page displays the following information :

[1L] IDENT	The runway ident, which comprises the airport identification and the runway direction. It uses six or seven digits (CYYZ 24L and LFRJ 08, for example).
[2L] LAT/LONG	The latitude and longitude of the runway threshold.
[4L] LENGTH	The runway length in meters (M) or feet (ft), in four digits (9 999 ft).
[5L] ELV	The elevation of the threshold in feet above sea level.
[6L] CRS	The runway course (degrees magnetic). T is displayed, if true North referenced.
[1R] LS IDENT	The LOC, ILS or GLS identifier.

Ident.: DSC-22_20-50-10-25-G-00006940.0001001 / 17 MAR 11

STORED RUNWAY PAGE

The pilot uses this page to display or delete runways defined and stored by the flight crew. The stored runways are listed and numbered in the order in which they were inserted. The number is displayed in the upper righthand corner of the page. (For example, 2/4 means the runway is the second of four stored runways).
The pilot can delete any stored runway from the database by displaying its ident in the 1L field, then pressing the CLR key on the MCDU control panel.

[6R] DELETE ALL and CONFIRM DELETE ALL	The pilot presses this key to erase all the stored runways, except those in use in the active or secondary flight plan. (The MCDU displays “F-PLN ELEMENT RETAINED”).
[1L] to [6L]	These fields are similar to RUNWAY page fields.

Note: *When 10 runways are stored, entering a new stored runway deletes the first one of the list (1/10).*

Ident.: DSC-22_20-50-10-25-G-00006941.0001001 / 12 FEB 13

NEW RUNWAY PAGE

The pilot can use this page to define and store up to 10 runways.
When the pilot enters an ILS/GLS /LOC ident in the [1R] field, the new navaid page comes up. When the pilot has entered the necessary data in the new navaid page and stored it, the new runway page reappears.

The new runway page and the new navaid page (ILS/GLS ◁ /LOC) are not independent :

- When the flight crew defines the ILS/GLS ◁ /LOC first (on the new navaid page), the new runway page, when called up, already displays the RWY course, RWY ident, and ILS/GLS ◁ ident (copied from the new navaid page).
- When the flight crew defines the runway first (on the new runway page) the new navaid page, when called up, already displays the ILS/GLS ◁ course, ILS/GLS ◁ ident, and runway ident.

The pilot must enter the two directions of a runway on two different new runway pages (LFRJ 08 and LFRJ 26, for example) to allow a flight plan to select either one.

[1L] to [6L]	Enter information about the new runway.
[1R] LS IDENT	Enter the ILS/GLS ◁ /LOC ident. The NEW NAVAID page comes up.
[5R] RETURN	When displayed, pressing this key return to NEW NAVAID page.
[6R] STORE	This prompt appears only when all the amber boxes have been filled.

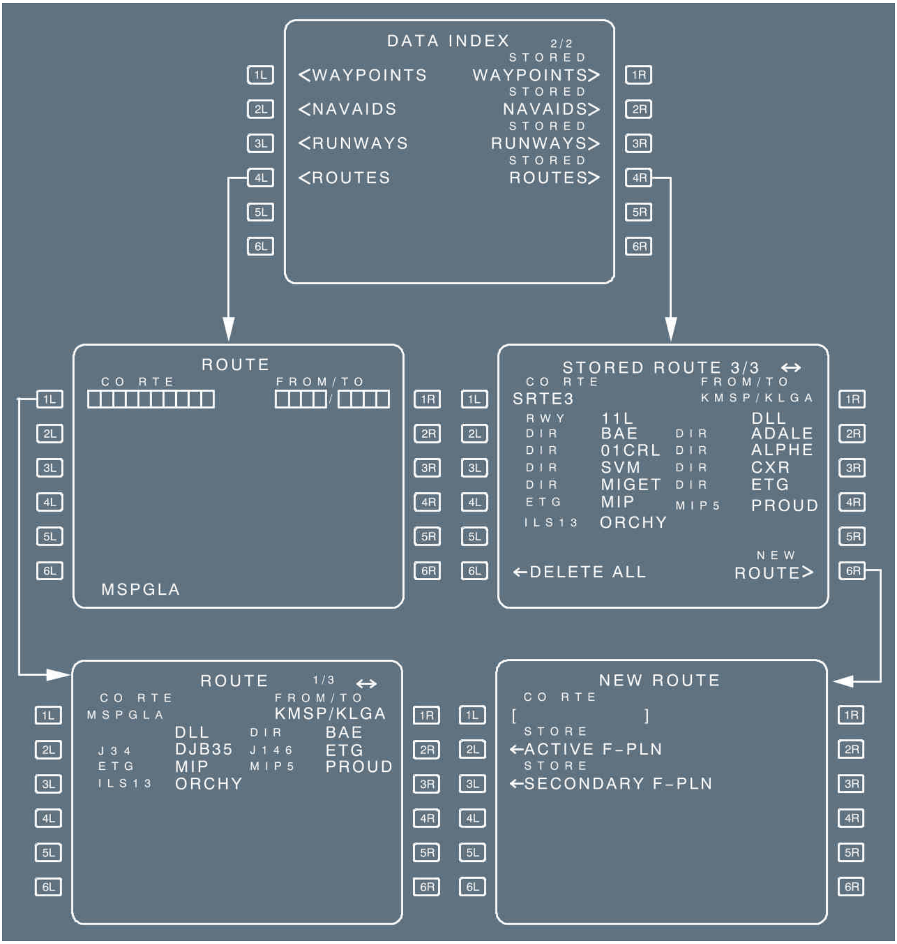
Note: - *The NEW RUNWAY may be used as departure or destination but no SID or STAR can be associated or stored with this runway. Therefore the pilot will use it as an “independent” airport.*
A new runway is identified by the 4 letter ICAO airport identifier although all six or seven digits must be entered.

ROUTE/STORED ROUTE/NEW ROUTE PAGES

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-H-00006943.0001001 / 14 MAY 12

SCHEMATIC


DATA INDEX 2/2
<WAYPOINTS
STORED WAYPOINTS>
<NAVAIDS
STORED NAVAIDS>
<RUNWAYS
STORED RUNWAYS>
<ROUTES
STORED ROUTES>
ROUTE
CO RTE
FROM/TO
MSPGLA
STORED ROUTE 3/3 ↔
CO RTE
FROM/TO
SRTE3
KMSP/KLGA
RWY 11L
DLL
DIR BAE
DIR ADALE
DIR 01CRL
DIR ALPHE
DIR SVM
DIR CXR
DIR MIGET
DIR ETG
ETG MIP
MIP5 PROUD
ILS13 ORCHY
←DELETE ALL
NEW ROUTE>
ROUTE 1/3 ↔
CO RTE
FROM/TO
MSPGLA
KMSP/KLGA
DLL
DIR BAE
J34 DJB35
J146 ETG
ETG MIP
MIP5 PROUD
ILS13 ORCHY
NEW ROUTE
CO RTE
[ ]
STORE
←ACTIVE F-PLN
STORE
←SECONDARY F-PLN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Ident.: DSC-22_20-50-10-25-H-00006944.0001001 / 17 MAR 11

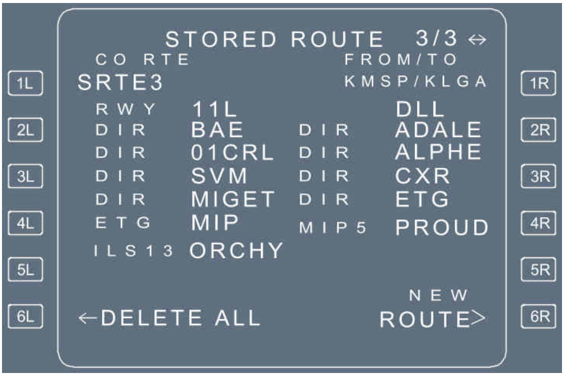
ROUTE PAGES

(Not-modifiable)

[1L] CO RTE	Any company route ident entered in this field causes all the elements of the route to be displayed.
Line 2 to Line 6	These lines display the various route elements, including waypoints and airways.
[1R] FROM/TO	This field is automatically filled when the pilot enters the ident for a company route. When the pilot enters a city pair manually, the MCDU displays “NOT IN DATA BASE” if the city pair is not in the navigation database. If the city pair is in the database, the CO RTE field displays the first route stored (small font, blue). If more than one route is stored, the pilot can slew to see the different routes.

Ident.: DSC-22_20-50-10-25-H-00006945.0001001 / 17 MAR 11

STORED ROUTE PAGE



```
        STORED ROUTE   3/3 ↔
 CO RTE               FROM/TO
SRTE3                KMSP/KLGA
 RWY    11L             DLL
 DIR    BAE      DIR    ADALE
 DIR    01CRL    DIR    ALPHE
 DIR    SVM      DIR    CXR
 DIR    MIGET    DIR    ETG
 ETG    MIP      MIP5   PROUD
 ILS13  ORCHY
                         NEW
←DELETE ALL            ROUTE>
```

This page displays up to 5 routes stored by the pilot. The stored route are listed and numbered in the order of insertion. The number is displayed in the upper right hand corner of the page.

[1L] CO RTE	This field identifies the stored route. Clearing this field deletes the stored route.
Line 2 to Line 5	The fields in these lines are identical to the corresponding fields in the route page.
[6L] DELETE ALL	Pressing this key changes the label to amber CONFIRM DELETE ALL. Pressing a second time this key deletes all routes previously stored by the crew.

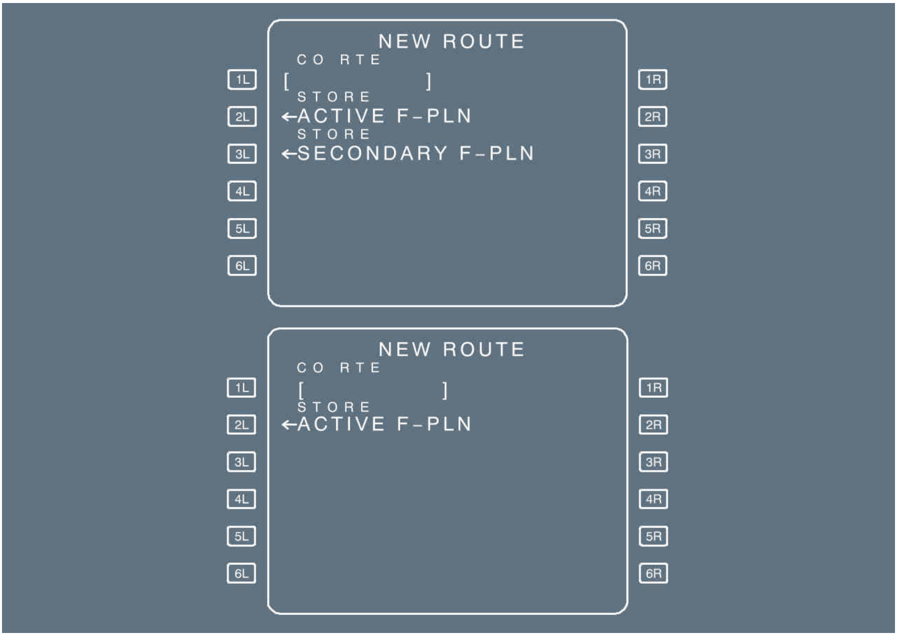
[1R] FROM/TO	This identifies the city pair of the stored route.
[6R] NEW ROUTE	Pressing this key calls up the new route page.

<u>*Note:*</u> *When 5 routes are already stored, the pilot cannot insert a new stored route. The message “STORED ROUTE FULL” is displayed and the pilot must manually delete a route to store a new one.*

Ident.: DSC-22_20-50-10-25-H-00006946.0001001 / 01 OCT 12

NEW ROUTE PAGE

The pilot calls up this page by pressing the NEW ROUTE key on the stored route page. It can be used to store up to five new routes that have already been defined in the active or secondary flight plan.



```
NEW ROUTE
 CO RTE
[           ]
 STORE
←ACTIVE F-PLN
 STORE
←SECONDARY F-PLN
```

```
NEW ROUTE
 CO RTE
 [           ]
 STORE
←ACTIVE F-PLN
```

[1L] CO RTE	This field enables the pilot to enter a new company route ident. If that ident has already been assigned, the entry is rejected.
[2L] STORE ACTIVE F-PLN (blue)	Pressing this key stores parameters of the active flight plan as new route. The display shows this prompt when the system contains a FROM/TO, but only during preflight.

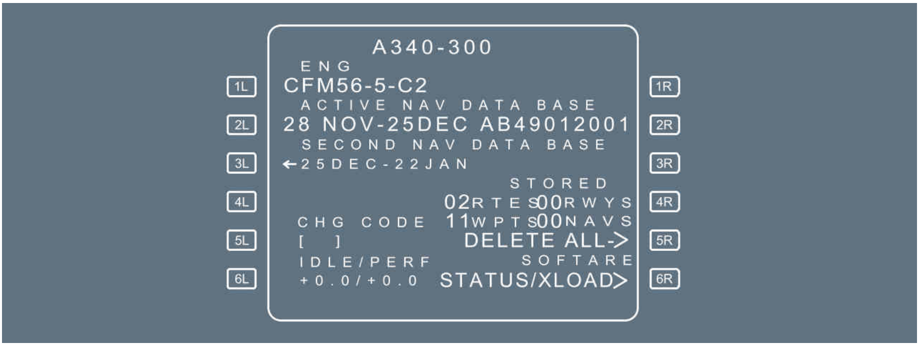
[3L] STORE SECONDARY F -PLN (blue)	Pressing this key stores parameters of the secondary flight plan as new route. The display shows this prompt when the system contains a FROM/TO and the secondary flight plan has not yet been sequenced.

Note:
- *If it has not already been named, a stored route is named automatically when stored : SRTE 1 to SRTE 5.*
- *When 5 routes are already stored, the pilot cannot insert a new route. The “STORED ROUTE FULL” message is displayed, and the pilot must manually delete a route in order to store a new one.*
- *Several elements of the flight plan are not retained, when the route is stored :*
  - *Pilot-entered holds*
  - *Offset*
  - *Pilot-entered constraints*
  - *Modifications to terminal procedures*
  - *Pseudo-waypoints*
  - *Step at optimum.*
  - *Pilot-entered Constant Mach Segment*
    The MCDU then displays “REVISIONS NOT STORED”.

AIRCRAFT STATUS PAGE

Ident.: DSC-22_20-50-10-25-00006947.0001001 / 13 JAN 14
Applicable to: ALL

The system automatically displays this page at power up, but the pilot may also call it up by pressing the DATA key on the MCDU console.



```
          A340-300
  ENG
CFM56-5-C2
  ACTIVE NAV DATA BASE
28 NOV-25DEC AB49012001
  SECOND NAV DATA BASE
←25DEC-22JAN
                      STORED
                02RTES 00RWYS
  CHG CODE      11WPTS 00NAVS
  [  ]            DELETE ALL->
  IDLE/PERF            SOFTARE
  +0.0/+0.0      STATUS/XLOAD>
```

TITLE	AIRCRAFT TYPE
[1L] ENGINE TYPE	The system uses this to calculate predictions.

Note: *When the same performance database is used for different aircraft configurations, the aircraft or engine type displayed in the [1L] field may differ from the actual aircraft.*

[2L] ACTIVE DATABASE	The display shows the validity period and part number in large font.
[3L] SECOND DATABASE	The display shows the validity period and part number in small font. The pilot can press the 3L key to switch to the second database as the active database.

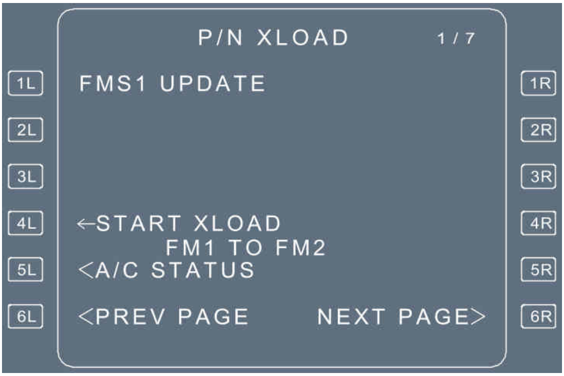
CAUTION	Cycling the database erases the primary and secondary flight plans, as well as stored data. The flight crew must never do this in flight.

[5L] CHG CODE	The maintenance crew can modify the IDLE/PERF factor displayed in [6L]. This field is displayed in the PREFLIGHT and DONE phases. The label is displayed in small white font. The brackets, or the entered value, is displayed in large blue font.
[6L] IDLE/PERF	These factors can only be modified while the aircraft is on ground. If no value has been entered, the databases' default value is displayed in small font. Some aircraft require that the IDLE/PERF factor, be adjusted. To do so, the crew may use the following procedure : - Enter “ARM” in the CHG CODE line's [5L] brackets. - Write the new IDLE/PERF factor in the scratchpad. - Enter this new factor in line [6L]. The entered factor is displayed in large green font. The airline may change the ARM code by modifying the NAV DATABASE policy file.
[4R] STORED	This field displays pilot-stored data in a large green font. The field is blank if no data is stored. (The airline can choose to have this data automatically erased at the done phase).
[5R] DELETE ALL	Pressing this key changes the label to amber CONFIRM DELETE ALL. Pressing this key a second time deletes all pilot–stored data, except data that is part of the active and secondary flight plans.
[6R] STATUS/XLOAD	This prompt gives access to the P/N STATUS and P/N XLOAD pages.

P/N XLOAD PAGE

Ident.: DSC-22_20-50-10-25-00006948.0001001 / 17 MAR 11
Applicable to: ALL

This page allows the crossloading of all the databases or the configuration files' part numbers which are different between both sides. Crossloading from this page avoids reviewing each individual P/N STATUS pages.



P/N XLOAD 1 / 7
FMS1 UPDATE
←START XLOAD
FM1 TO FM2
<A/C STATUS
<PREV PAGE NEXT PAGE>

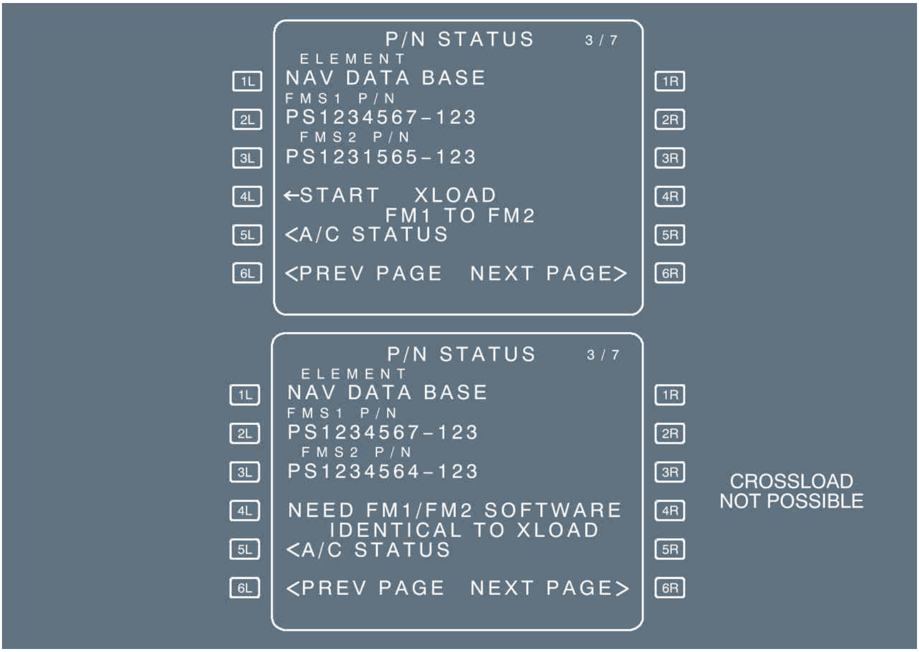
TITLE	P/N XLOAD
[1L]	FMS1 UPDATE : FMS1 can be loaded on the right side MCDU FMS2 UPDATE : FMS2 can be loaded on the left side MCDU
[4L]	START XLOAD : This blue prompt is displayed, only if the system detects a difference between both side part numbers. FMS1/FMS2 IDENTICAL : Displayed in green, when there is no difference between both side part numbers.
Line 5	FM1 TO FM2 or FM2 TO FM1 : Indicates the crossloading direction. This line is not displayed when there is no difference between both side part numbers.
[5L]	A/C STATUS : This white prompt is displayed when there is no crossloading in process. It gives access to the A/C STATUS page. MM : SS MIN REMAINING : Indicates the time remaining for crossload completion, when a crossload is in process.
[6L] PREV PAGE	The pilot presses this key to return to the A/C STATUS page.
[6R] NEXT PAGE	The pilot presses this key to callup the next P/N XLOAD page.

P/N STATUS PAGES

Ident.: DSC-22_20-50-10-25-00006949.0001001 / 14 MAY 12
Applicable to: ALL

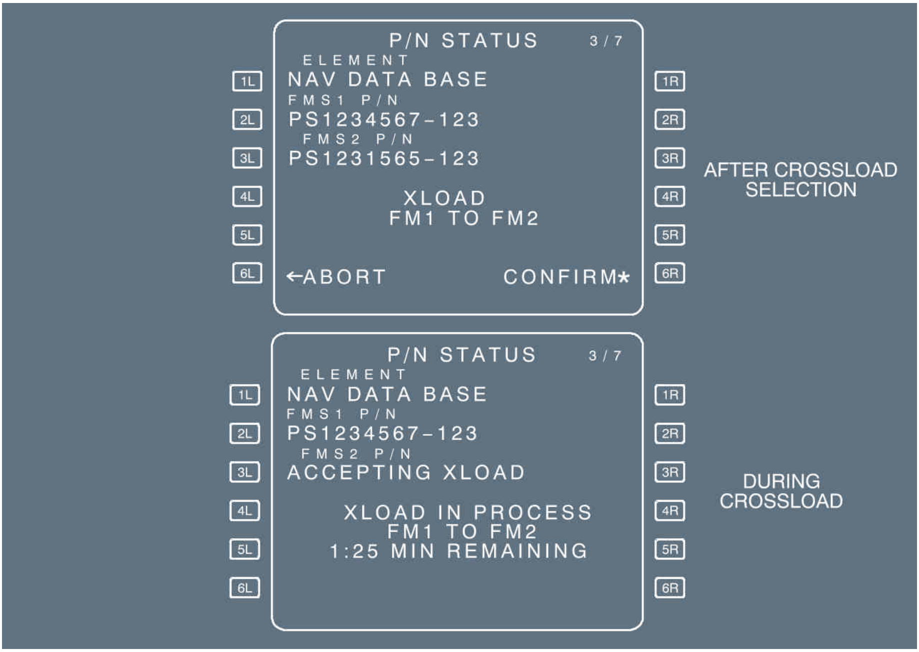
These pages allow reviewing and crossloading the following databases and configuration files between both FMS :

- page 2	FMS SOFTWARE part numbers
- page 3	NAV DATA BASE part numbers
- page 4	FM AIRLINE CONFIG part numbers
- page 5	FM OPTIONS CONFIG part numbers
- page 6	PERF DATA BASE part numbers
- page 7	FLIGHT TEST DATA BASE



```
        P/N STATUS        3/7
 ELEMENT
NAV DATA BASE
FMS1 P/N
PS1234567-123
 FMS2 P/N
PS1231565-123

←START    XLOAD
      FM1 TO FM2
<A/C STATUS

<PREV PAGE    NEXT PAGE>
```

```
        P/N STATUS        3/7
 ELEMENT
NAV DATA BASE
FMS1 P/N
PS1234567-123
 FMS2 P/N
PS1234564-123

NEED FM1/FM2 SOFTWARE
   IDENTICAL TO XLOAD
<A/C STATUS

<PREV PAGE    NEXT PAGE>
```



```
P/N STATUS          3/7
  ELEMENT
NAV DATA BASE
FMS1 P/N
PS1234567-123
  FMS2 P/N
PS1231565-123

       XLOAD
     FM1 TO FM2

←ABORT          CONFIRM*
```

```
P/N STATUS          3/7
  ELEMENT
NAV DATA BASE
FMS1 P/N
PS1234567-123
  FMS2 P/N
ACCEPTING XLOAD

   XLOAD IN PROCESS
     FM1 TO FM2
  1:25 MIN REMAINING
```

TITLE	P/N STATUS
Line 1 ELEMENT	Indicate the name of the database or configuration file that can be crossloaded : - FMS SOFTWARE on page 2 - NAV DATA BASE on page 3 - FM AIRLINE CONFIG on page 4 - FM OPTIONS CONFIG on page 5 - PERF DATA BASE on page 6 - FLIGHT TEST DATABASE on page 7.
Line 2 FMS1 P/N Line 3 FMS2 P/N	These fields display the part numbers of the database or configuration file stated on line 1, that are installed on FMS 1 and FMS 2. Identical part numbers are displayed in green, different ones in amber. During crossload, the updated part number is replaced by the amber “ACCEPTING XLOAD” message.

Line 4	This line is empty when the active flight phase is not Preflight or Done. XLOAD FMx TO FMy or START XLOAD FMx TO FMy : This blue prompt is displayed when the database or configuration file stated on line 1 can be crossloaded. XLOAD ARMED : Displayed in blue on the receiving FM when the crossload has been requested, but not yet confirmed. XLOAD IN PROCESS : Displayed in white when the crossload is ongoing. XLOAD NOT SUPPORTED : Crossloading is unavailable for this element. NO P/N TO XLOAD : The element is missing. NEED FG1/FG2 IDENTICAL TO XLOAD : The FG software of the receiving side is incompatible with the FG software to be crossloaded. NEED FM1/FM2 SOFTWARE IDENTICAL TO XLOAD : The crossloaded element is incompatible with the receiving side FM software.
[5L] A/C STATUS	This prompt is available when no crossload is in process. This gives the pilot access to the aircraft status page. MM : SS MIN REMAINING : Displays the time remaining to complete the crossload, when a crossload is in process.
[6L] PREV PAGE ABORT	This key calls up the previous P/N STATUS page. This amber prompt is displayed when a crossload is in process. The pilot uses it to stop the crossload.
[6R] NEXT PAGE CONFIRM*	This key calls up the next P/N STATUS page. This amber prompt is displayed when a crossload has been armed. The pilot presses it to start the crossload.

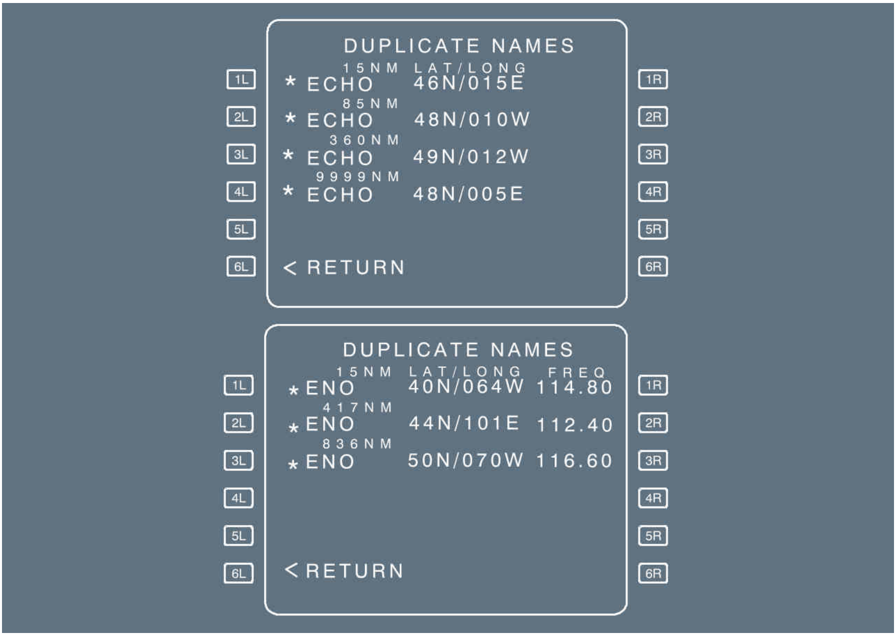
DUPLICATE NAMES PAGE

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-I-00006950.0001001 / 14 MAY 12

GENERAL

This page, which appears automatically, allows the pilot to select a specific waypoint, airport, or navaid when the database holds more than one under the same identifier.



```
     DUPLICATE NAMES
       15NM  LAT/LONG
* ECHO     46N/015E
       85NM
* ECHO     48N/010W
      360NM
* ECHO     49N/012W
     9999NM
* ECHO     48N/005E


< RETURN
```

```
     DUPLICATE NAMES
      15NM  LAT/LONG   FREQ
*ENO       40N/064W  114.80
     417NM
*ENO       44N/101E  112.40
     836NM
*ENO       50N/070W  116.60



<RETURN
```

The pilot presses the key adjacent to a waypoint, navaid, or airport to select it as the one to be entered. When the pilot has finished, the page automatically reverts to the previously displayed page.

Ident.: DSC-22_20-50-10-25-I-00006951.0001001 / 10 DEC 09

DISTANCE

The direct distance to the aircraft is displayed in green above each name. If this distance is greater than 9 999 NM, 9 999 NM is displayed.

Ident.: DSC-22_20-50-10-25-I-00006952.0001001 / 10 DEC 09

LAT/LONG COLUMN

This column lists the rounded off latitudes and longitudes, of the different points using the same identifier.

Ident.: DSC-22_20-50-10-25-I-00006953.0001001 / 12 FEB 13

FREQ/CHAN COLUMN

This column lists the navaids frequencies, if any. It displays CHAN for a GLS ◁ .

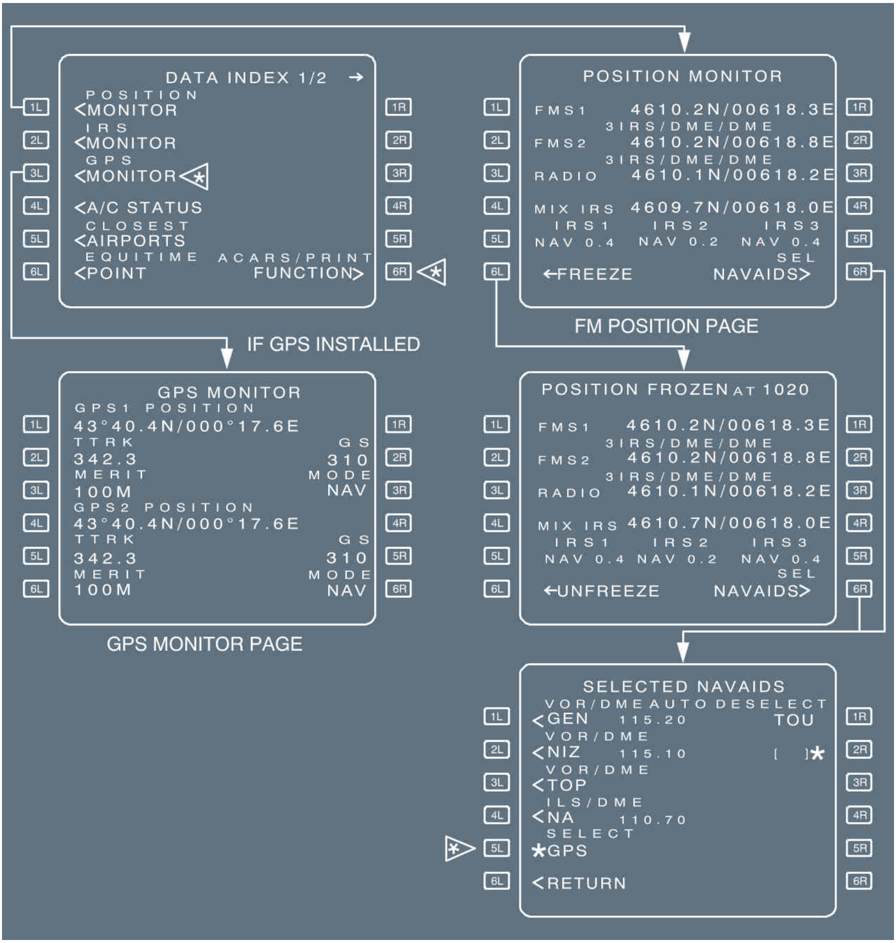
Note:
- *The DUPLICATE NAMES page is not displayed when 2 waypoints with the same ident belong to the same airway. The system selects the first waypoint found in the database.*
- *The waypoints or navaids are ranked by their distance from the aircraft position.*
- *When a waypoint is named using ICAO phonetic alpha characters, a minus sign and the ICAO code of the country where the waypoint is located, are displayed. e.g. Alpha in France becomes A-LF ; Bravo in England becomes B-EG.*

POSITION MONITOR PAGE

Ident.: DSC-22_20-50-10-25-J-00006954.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

GENERAL

The position monitor page displays all the different positions that the FMGEC has computed with the different methods of navigation available. It also displays which method obtained each position. (The positions should be almost identical).
The flight crew calls up this page by pressing the 1L key on the data index page.

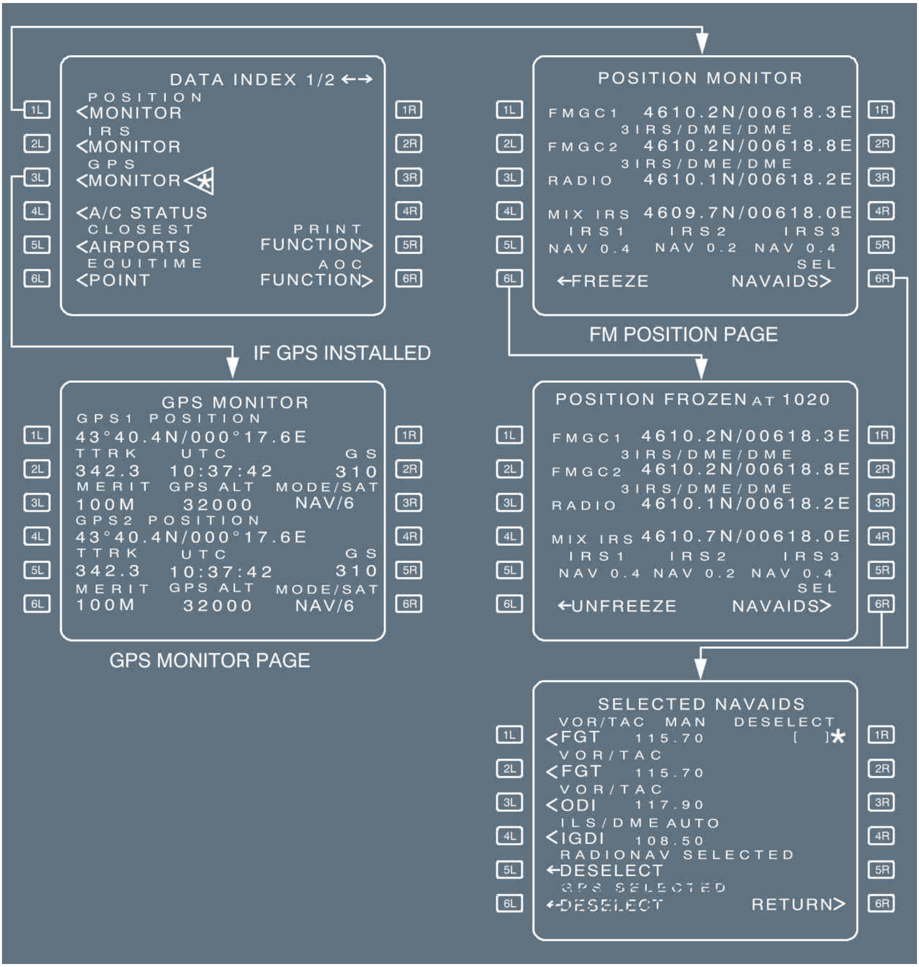

DATA INDEX 1/2 →
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR
<A/C STATUS
CLOSEST
<AIRPORTS
EQUITIME
<POINT
ACARS/PRINT
FUNCTION>
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
POSITION MONITOR
FMS1 4610.2N/00618.3E
3IRS/DME/DME
FMS2 4610.2N/00618.8E
3IRS/DME/DME
RADIO 4610.1N/00618.2E
MIX IRS 4609.7N/00618.0E
IRS1 IRS2 IRS3
NAV 0.4 NAV 0.2 NAV 0.4
SEL
←FREEZE
NAVAIDS>
FM POSITION PAGE
IF GPS INSTALLED
GPS MONITOR
GPS1 POSITION
43°40.4N/000°17.6E
TTRK
342.3
GS
310
MERIT
100M
MODE
NAV
GPS2 POSITION
43°40.4N/000°17.6E
TTRK
342.3
GS
310
MERIT
100M
MODE
NAV
GPS MONITOR PAGE
POSITION FROZEN AT 1020
FMS1 4610.2N/00618.3E
3IRS/DME/DME
FMS2 4610.2N/00618.8E
3IRS/DME/DME
RADIO 4610.1N/00618.2E
MIX IRS 4610.7N/00618.0E
IRS1 IRS2 IRS3
NAV 0.4 NAV 0.2 NAV 0.4
SEL
←UNFREEZE
NAVAIDS>
SELECTED NAVAIDS
VOR/DME AUTO DESELECT
<GEN 115.20 TOU
VOR/DME
<NIZ 115.10 [ ]*
VOR/DME
<TOP
ILS/DME
<NA 110.70
SELECT
*GPS
<RETURN

Ident.: DSC-22_20-50-10-25-J-00006954.0003001 / 01 OCT 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

This page displays all the different positions that the FMGEC has computed with the various available navigation methods. It also shows which method obtained each position. (The positions should be almost identical).

The pilot calls up this page by pressing the 1L key on the DATA INDEX page.


DATA INDEX 1/2 ←→
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR<*
<A/C STATUS
CLOSEST
<AIRPORTS
PRINT
FUNCTION>
EQUITIME
<POINT
AOC
FUNCTION>
POSITION MONITOR
FMGC1 4610.2N/00618.3E
3IRS/DME/DME
FMGC2 4610.2N/00618.8E
3IRS/DME/DME
RADIO 4610.1N/00618.2E
MIX IRS 4609.7N/00618.0E
IRS1 IRS2 IRS3
NAV 0.4 NAV 0.2 NAV 0.4
SEL
←FREEZE
NAVAIDS>
FM POSITION PAGE
IF GPS INSTALLED
GPS MONITOR
GPS1 POSITION
43°40.4N/000°17.6E
TTRK UTC GS
342.3 10:37:42 310
MERIT GPS ALT MODE/SAT
100M 32000 NAV/6
GPS2 POSITION
43°40.4N/000°17.6E
TTRK UTC GS
342.3 10:37:42 310
MERIT GPS ALT MODE/SAT
100M 32000 NAV/6
GPS MONITOR PAGE
POSITION FROZEN AT 1020
FMGC1 4610.2N/00618.3E
3IRS/DME/DME
FMGC2 4610.2N/00618.8E
3IRS/DME/DME
RADIO 4610.1N/00618.2E
MIX IRS 4610.7N/00618.0E
IRS1 IRS2 IRS3
NAV 0.4 NAV 0.2 NAV 0.4
SEL
←UNFREEZE
NAVAIDS>
SELECTED NAVAIDS
VOR/TAC MAN DESELECT
<FGT 115.70 [ ]*
VOR/TAC
<FGT 115.70
VOR/TAC
<ODI 117.90
ILS/DME AUTO
<IGDI 108.50
RADIONAV SELECTED
←DESELECT
GPS SELECTED
←DESELECT
RETURN>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Ident.: DSC-22_20-50-10-25-J-00006955.0003001 / 30 MAR 12
Applicable to: LV-GKO, LV-GKP

POSITION MONITOR AND POSITION FROZEN PAGE

Line 1 FMGEC 1	This line displays the latitude and longitude as calculated by the FMGEC 1, and the method of navigation the FMGEC used for that calculation (for example, “3IRS/DME/DME”).

Line 2 FMGEC 2	This line displays the latitude and longitude as calculated by the FMGEC 2, and the method of navigation used.
Line 3 RADIO or GPS or GPIRS	This line displays the latitude and longitude the onside FMGEC calculated from selected radio navaids (for example, DME/DME VOR/DME, or LOC) or from GPS or GPIRS.
Line 4 MIX IRS	This line displays the latitude and longitude of the weighted mean inertial reference system (IRS) that the onside FMGEC calculated from the available IRSs.
Line 5 IRS 1,2,3	This line displays the deviation in nautical miles of each IRS position from the onside FMGEC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT. *Note:* *INVAL is displayed, when an ADIRS has failed or the IRS position is not refreshed.*
[6L] FREEZE/UNFREEZE	The flight crew presses this key to freeze (or unfreeze) all the data displayed on the page. When the data are frozen, the title of the page specifies the time at which they were frozen.
[6R] SEL NAVAIDS	The flight crew presses this key to gain access to the selected navaids page.

Ident.: DSC-22_20-50-10-25-J-00006955.0004001 / 01 OCT 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Line 1 FMGEC 1	This line shows the latitude and longitude as calculated by the FMGEC 1, and the navigation method the FMGEC used for that calculation (for example, “3IRS/DME/DME”).
Line 2 FMGEC 2	This line shows the latitude and longitude as calculated by the FMGEC 2, and the method of navigation used, in white.
Line 3 RADIO or GPS or GPIRS or RADIO DESELECTED	This line shows the latitude and longitude in green calculated by the onside FMGEC from selected radio NAVAIDs (for example, DME/DME, VOR/DME, or LOC) or from GPS or GPIRS. The selected radio NAVAIDs are displayed in white.
Line 4 MIX IRS	This line shows the latitude and longitude of the weighted mean inertial reference system (IRS) calculated by the onside FMGEC from the available IRSs.

Line 5 IRS 1, 2, 3	This line shows the deviation in nautical miles of each IRS position from the onside FMGEC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT. *Note:* *INVAL is displayed, when an ADIRS has failed or the IRS position is not refreshed.*
[6L] FREEZE/UNFREEZE	The flight crew presses this key to freeze (or unfreeze) all the data displayed on the page. When the data is frozen, the title of the page specifies the time at which they were frozen.
[6R] SEL NAVAIDS	The flight crew presses this key to gain access to the selected NAVAIDs page.

SELECTED NAVAIDS PAGE

Ident.: DSC-22_20-50-10-25-00006956.0002001 / 17 MAR 11
Applicable to: LV-GKO, LV-GKP

MODIFIABLE ONLY FOR DESELECTION

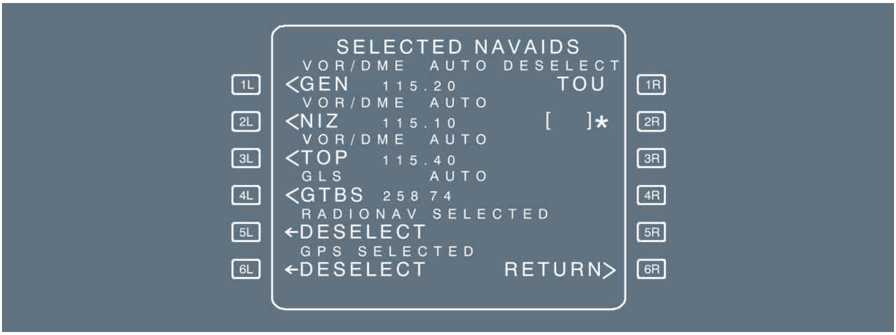
Line 1	This line displays the navaid tuned for display purposes, and the tuning mode (AUTO, MAN, or RMP).
Line 2 and 3	These lines display the navaids, if any, tuned for the calculation of radio position by the FMGEC.
[4L]	This field displays the tuned ILS (or MLS), if any.
[5L] DESELECT/SELECT GPS	The crew presses this key to manually select or deselect the GPS for position computation. Upon transition to DONE phase the prompt returns to DESELECT status. If the pilot deselects the GPS, “GPS IS DESELECTED” is displayed when the aircraft is at less than 80 NM from the top of descent, or in approach phase.
[6L] RETURN	The pilot presses this key to return to the position monitor page.
[1R] to [6R] DESELECT	The pilot deselects a navaid by entering its identifier in one of these six fields. Once deselected in this way, the navaid can no longer be tuned manually through the entry of its ident, nor can it be autotuned for display or determination of the position for the rest of the flight. The deselection is cleared - manually by a CLR action into this field, or - automatically upon transition to the done or preflight phase, or upon activation of the second database.

The pilot may deselect as many as six stations.

SELECTED NAVAIDS PAGE

Ident.: DSC-22_20-50-10-25-00006956.0004001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MODIFIABLE FOR SELECTION/DESELECTION



```
     SELECTED NAVAIDS
  VOR/DME  AUTO  DESELECT
<GEN    115.20        TOU
  VOR/DME  AUTO
<NIZ    115.10       [   ]*
  VOR/DME  AUTO
<TOP    115.40
  GLS      AUTO
<GTBS  258 74
  RADIONAV SELECTED
←DESELECT
  GPS SELECTED
←DESELECT         RETURN>
```

[1L]	This field displays the ident of the NAVAID tuned for display purposes, in blue, and the frequency of the NAVAID in green.
[2L] to [3L]	These fields display the ident of the NAVAIDs tuned for the calculation of the radio position by the FMGEC, in blue, and the frequency of the NAVAIDs in green.
[4L]	This field displays the ident of the landing system (XLS) in blue, and the frequency (or the channel) of the landing system in green.

Note: *For fields [1L] to [4L] the class of the tuned NAVAID or the landing systems, and the tuning mode (AUTO, MAN, or RMP) are displayed in white in the label field.*

[5L]	The flight crew presses this key to manually select or deselect the NAVAIDs. If the flight crew selects (deselects) the NAVAIDs for position calculation, “RADIONAV SELECTED” (“RADIONAV DESELECTED”) is displayed in the label line in blue small font and “DESELECT” (“SELECT”) is displayed in white large font. By default NAVAIDs are selected. The deselection of the RADIONAV inhibits use of radio position (either DME/DME or VOR/DME) for position calculation.

[6L]	The flight crew presses this key to manually select or deselect the GPS. If the flight crew selects (deselects) the GPS, “GPS SELECTED” (“GPS DESELECTED”) is displayed in the label line in blue small font and “DESELECT” (“SELECT”) is displayed in white large font. By default GPS is selected. If the flight crew deselects the GPS, “GPS IS DESELECTED” MCDU message is displayed when the aircraft is less than 80 NM from the top of descent, or in approach phase.
[1R] to [5R] DESELECT	The flight crew deselects a NAVAID by entering its identifier in one of these four fields. Once deselected the flight crew can manually tune the NAVAID by entering the ident of the NAVAID for display purposes. The deselection can be cleared: - Manually, by a CLR action in this field, or - Automatically upon transition to the done or preflight phase, or upon activation of the second database. The flight crew may deselects as many as four stations. If the flight crew attempts to deselect a NAVAID that has been previously deselected, the “XXXX IS DESELECTED” MCDU message is displayed.
[6R] RETURN	The flight crew presses this key to return to the POSITION MONITOR page.

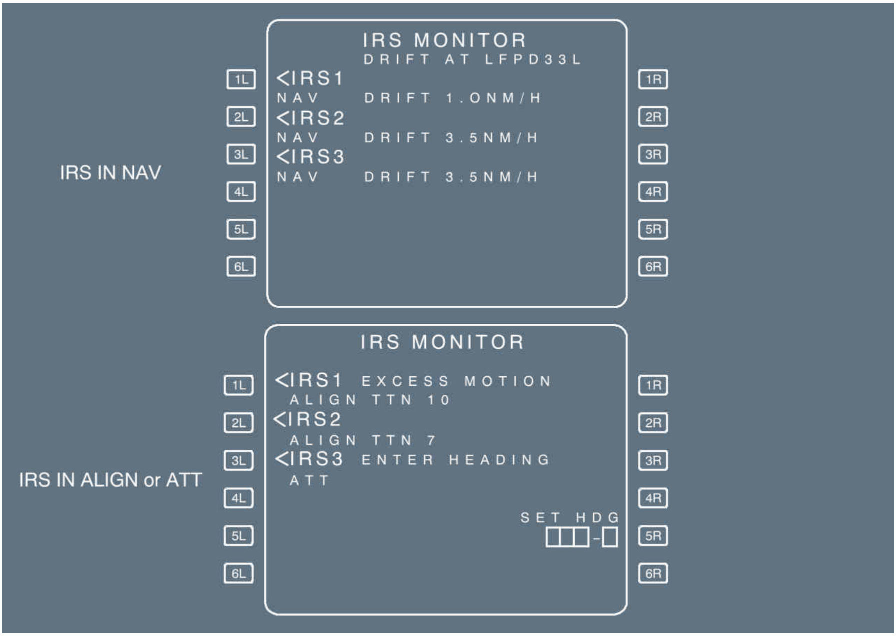
IRS MONITOR PAGE

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-K-00006957.0001001 / 14 MAY 12

GENERAL

This page displays the IRS data. The crew calls up this page by pressing the IRS monitor prompt of the DATA INDEX page.


IRS IN NAV
IRS MONITOR
DRIFT AT LFPD33L
<IRS1
NAV DRIFT 1.0NM/H
<IRS2
NAV DRIFT 3.5NM/H
<IRS3
NAV DRIFT 3.5NM/H
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
IRS IN ALIGN or ATT
IRS MONITOR
<IRS1 EXCESS MOTION
ALIGN TTN 10
<IRS2
ALIGN TTN 7
<IRS3 ENTER HEADING
ATT
SET HDG
□□□-□
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

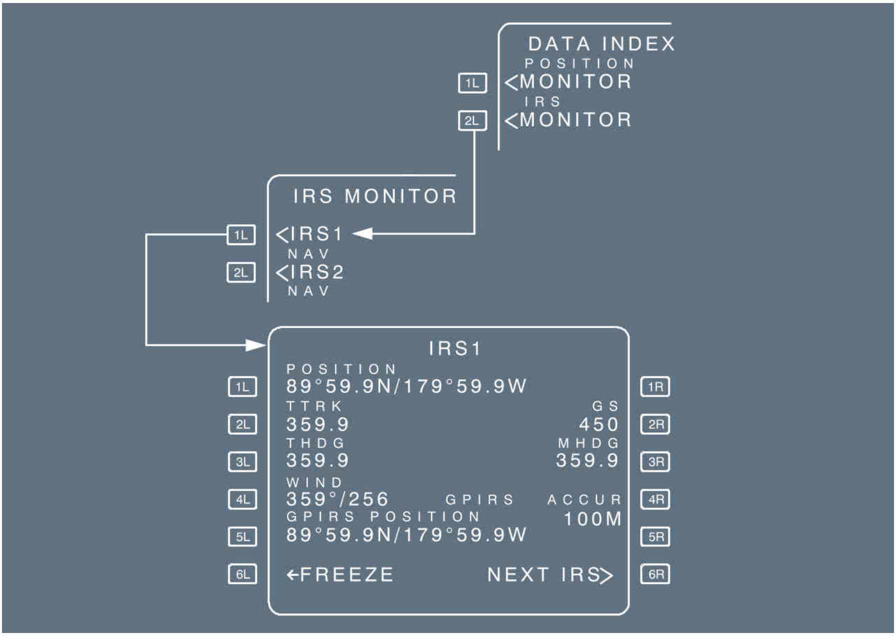
TITLE DRIFT AT XXXX (amber)	Displays “DRIFT AT” runway identifier if at least one IRS average drift is displayed.
[1L] to [3L] IRS 1(2) (3) (white)	These prompts allow access to the associated IRS pages. Each label line displays the mode (NAV, ALIGN, ATT or INVAL) the average drift (upon transition to DONE phase) the Time To NAV (if IRS in align) for each IRS.

[1R] to [3R]	Displays the status message of the associated IRS in green small font. List of available messages : IR FAULT CHECK C/B DELAYED MAINT CDU FAULT ENTER PPOS ENTER HEADING SELECT ATT REENTER PPOS EXCESS MOTION SYS BELOW – 15 ° SWITCH ADR
[5R] SET HDG (white)	This field is displayed if at least one IRS is in ATT mode. This function allows initialization of a heading for IRS in ATT mode. • If a heading has been entered in this field or on the ADIRS panel the value is displayed in blue. • If not, amber boxes are displayed.

Ident.: DSC-22_20-50-10-25-K-00006958.0001001 / 14 MAY 12

IRS 1 (2)(3) PAGE

This page displays the IRS parameters, and GPS/IRS hybrid parameters, if GPS ◁ . This page is accessed either by pressing the 1L key from the IRS MONITOR page, or the NEXT IRS prompt on another IRS page (closed loop).

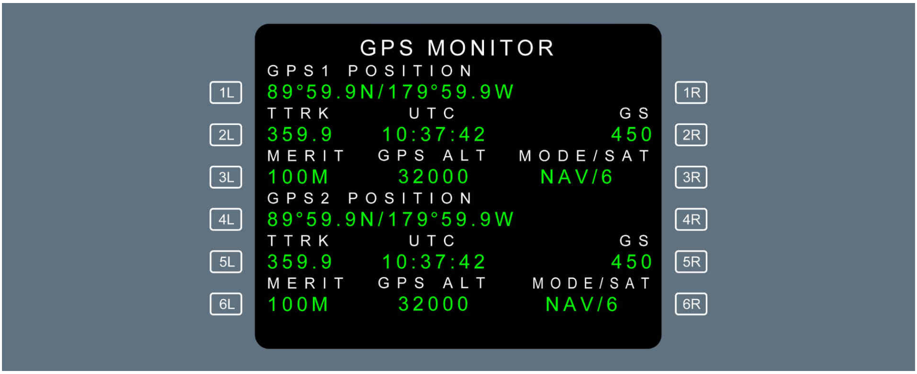

DATA INDEX
POSITION
1L <MONITOR
IRS
2L <MONITOR
IRS MONITOR
1L <IRS1
NAV
2L <IRS2
NAV
IRS1
POSITION
1L 89°59.9N/179°59.9W
TTRK
2L 359.9
GS
2R 450
THDG
3L 359.9
MHDG
3R 359.9
WIND
4L 359°/256
GPIRS
ACCUR
4R 100M
GPIRS POSITION
5L 89°59.9N/179°59.9W
6L ←FREEZE
NEXT IRS> 6R
1R
5R

TITLE	Displays the selected IRS in large white font. When data is frozen, IRS is replaced by “IRS FROZEN AT”, followed by the time at which the pilot has frozen the display.
[1L] POSITION	Displays the latitude/longitude given by the selected IRS.
[2L] TTRK	True track
[3L] THDG	True heading
[4L] WIND	True wind direction/velocity
[5L] GPIRS	GPS/IRS hybrid position of the IRS
[6L] FREEZE/UNFREEZE	Allows the crew to freeze or unfreeze all data displayed on all three IRS pages. When the data is frozen, the title of the page specifies the time at which it was frozen. It is automatically unfrozen when the page is exited.
[2R] GS	Ground speed
[3R] MHDG	Magnetic heading
[4R] GPIRS ACCUR	GPS/IRS Figure of Merit (meters or feet)
[6R] NEXT IRS	This prompt enables the display of another IRS page (closed loop IRS 1 → 2 → 3 → 1)

GPS MONITOR PAGE ◁

Ident.: DSC-22_20-50-10-25-00007060.0001001 / 04 NOV 22
Applicable to: ALL

This page displays the GPS data. The flight crew calls up this page by pressing the GPS MONITOR ◁ prompt of the DATA INDEX page.



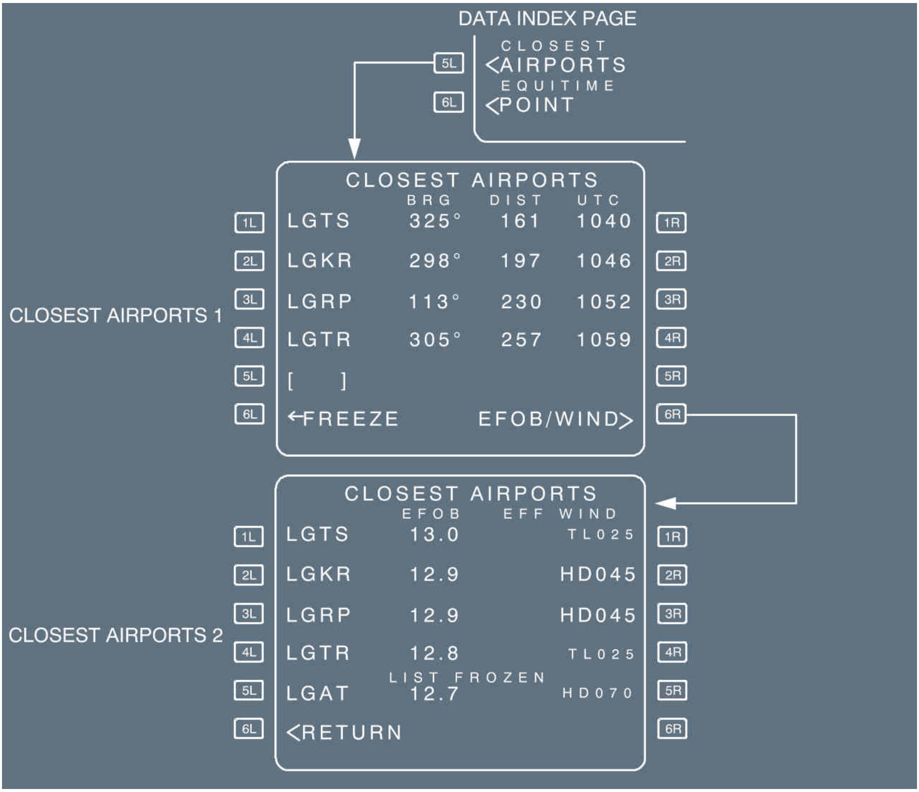
```
              GPS MONITOR
 GPS1 POSITION
 89°59.9N/179°59.9W
 TTRK      UTC           GS
 359.9    10:37:42      450
 MERIT    GPS ALT    MODE/SAT
 100M      32000      NAV/6
 GPS2 POSITION
 89°59.9N/179°59.9W
 TTRK      UTC           GS
 359.9    10:37:42      450
 MERIT    GPS ALT    MODE/SAT
 100M      32000      NAV/6
```

[1L] and [4L]	Display the GPS 1 and 2 positions.
[2L] - [2R] and [5L] - [5R] TTRK-UTC-GS	Display the GPS 1 and 2 true tracks. UTC fields indicate UTC time for each GPS sensor. GS fields indicate the GPS 1 and 2 ground speed.
[3L] - [3R] and [6L] - [6R] MERIT-GPS ALT-MODE/SAT	Display the GPS 1 and 2 figures of merit (in meters or feet). GPS ALT is displayed for information purposes. It is not used by the FMGES. MODE/SAT fields indicate the GPS 1 and 2 modes followed by the number of satellites tracked. The GPS can operate in the following modes: INIT : System initialization ACQ : Satellite acquisition NAV : Normal mode TEST : System test FAULT : Invalid system ALTAID or AIDED : Degraded modes. The MMR uses aircraft inputs for computation purposes. SBAS ◁ : Satellite Based Augmentation System is being used.

CLOSEST AIRPORTS PAGES

Ident.: DSC-22_20-50-10-25-00007077.0001001 / 14 MAY 12
Applicable to: ALL

The system selects automatically the 4 closest airports from the current aircraft position and displays them on these pages. A fifth one can be selected by the pilot.
The page 1 displays the bearing, distance and time to go to each airport, the page 2 displays the EFOB and allows the crew to enter an effective wind to be flown to each airport.
The flight crew accesses the CLOSEST AIRPORTS page 1 by depressing 5L key from DATA INDEX A page, the CLOSEST AIRPORTS page 2 by pressing the EFOB/WIND prompt (6R key) on the page 1.



```
    CLOSEST
<AIRPORTS
    EQUITIME
<POINT
```

```
      CLOSEST AIRPORTS
           BRG    DIST   UTC
LGTS       325°   161    1040
LGKR       298°   197    1046
LGRP       113°   230    1052
LGTR       305°   257    1059
[    ]
←FREEZE          EFOB/WIND>
```

```
      CLOSEST AIRPORTS
           EFOB    EFF WIND
LGTS       13.0        TL025
LGKR       12.9        HD045
LGRP       12.9        HD045
LGTR       12.8        TL025
         LIST FROZEN
LGAT       12.7        HD070
<RETURN
```

[1L] - [1R] to [4L] - [4R]	The four closest airports are extracted from the database, and ranked by distance from the aircraft position.

BRG	displays the current bearing from the aircraft position to the airport. T is added if true reference is selected.
DIST	displays the current great circle distance from the aircraft position to the airport.
TIME or UTC	displays the predicted time to the airport computed using the current wind or a wind vector entered on the page 2 and the speed according to current mode (managed or selected). The time is only computed in cruise phase.

[5L]	The crew may enter a fifth airport here using the 4 letter code. The entry may be modified at any moment even when the “LIST FROZEN” is displayed.

If the pilot enters an airport that is not in the database, then “NOT IN DATABASE” appears in the scratchpad.

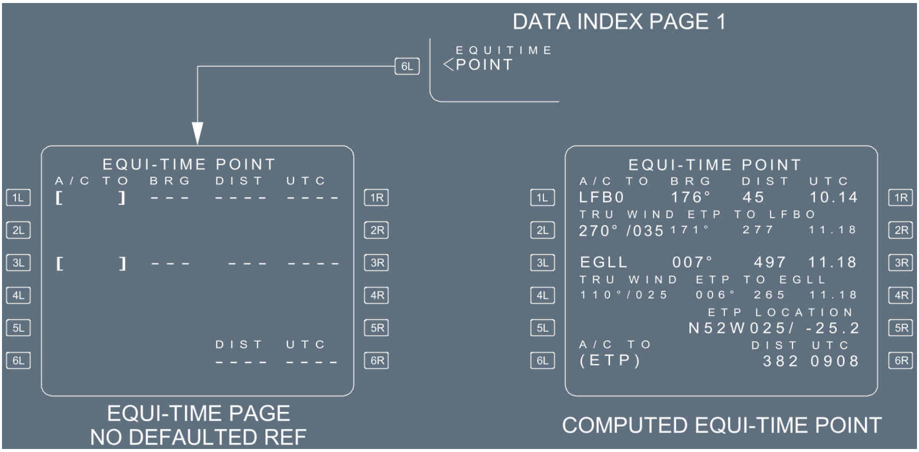
[1L] - [1R] EFOB to [5L] - [5R] EFF WIND	Displays the EFOB at each airport. EFOB is only computed in cruise phase. The pilot may enter here an anticipated headwind or tailwind along the bearing to the airport. If the entry is preceded by +, T, TL a tail wind is assumed. If the entry is preceded by –, H, HD a head wind is assumed. Before the pilot entry, a default value may be displayed, based on the current wind. The effective wind is used to compute the EFOB and time to the airport.
[6L] FREEZE/UNFREEZE	This prompt allows the pilot to freeze and unfreeze the list of four airports. The list is automatically frozen upon accessing the page 2. It will remain frozen upon returning to page 1. The “LIST FROZEN” message is always displayed on page 2.
RETURN	Returns to the page 1.
[6R] EFOB/WIND	Gives access to the page 2. Pressing this prompt automatically freezes the list of four closest airports.

Note:
- *If the aircraft position becomes invalid, all fields are dashed, FREEZE/UNFREEZE and EFOB/WIND prompts are removed, LIST FROZEN is displayed and the A/C POSITION INVALID message is displayed in the scratchpad. Page 2 may not be accessed.*
- *Predictions (EFOB, TIME) displayed on the page assume :*
  - *ECON CRZ speed (managed) or current selected speed (selected) ;*
  - *CI (for managed speed only) and CRZ FL from primary F-PLN are kept ;*
  - *Constant wind value ;*
  - *In case of engine out, the aircraft altitude is the minimum of (CRZ FL, EO REC MAX) ;*
  - *Downpath steps are not considered ;*
  - *Descent fuel burn is a conservative value which only depends on the difference between current CRZ ALT and destination altitude.*

EQUI-TIME POINT PAGE

Ident.: DSC-22_20-50-10-25-00007081.0001001 / 16 MAR 11
Applicable to: ALL

The pilot will use this page to require an equitime point computation between two different points (airport, navaid runway or waypoint). This pseudo-waypoint is displayed on the navigation display along the F-PLN. The EQUI-TIME POINT page is accessed by pressing the 6L key from the DATA INDEX page :


DATA INDEX PAGE 1
6L
EQUITIME
<POINT
EQUI-TIME POINT
A/C TO BRG DIST UTC
[ ] --- ---- ----
[ ] --- --- ----
DIST UTC
---- ----
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
EQUI-TIME POINT
A/C TO BRG DIST UTC
LFBO 176° 45 10.14
TRU WIND ETP TO LFBO
270° /035 171° 277 11.18
EGLL 007° 497 11.18
TRU WIND ETP TO EGLL
110°/025 006° 265 11.18
ETP LOCATION
N52W025/ -25.2
A/C TO DIST UTC
(ETP) 382 0908

EQUI-TIME PAGE
NO DEFAULTED REF

COMPUTED EQUI-TIME POINT

[1L] A/C TO (blue)	Displays reference waypoint 1.
[3L] A/C TO (blue)	Displays reference waypoint 2.

Note: *Origin and destination airports are used by default for respective reference points 1 and 2 until a pilot entry is made.*

[1R] BRG/DIST/UTC and (TIME)	This field displays the bearing, distance, time from the aircraft's current position to the reference waypoint 1.
[3R] (green)	Idem for the reference waypoint 2. BRG : Displays the current great circle bearing from the aircraft's position to the reference waypoint. T is added, if TRUE reference is selected. DIST : Displays the current great circle distance from the aircraft's position to the reference waypoint. TIME : Displays the predicted time to the reference waypoint (computed using the current wind or a wind vector entered by the crew). Time is only computed in cruise phase, otherwise it is dashed.
[2L] and [4L] TRU WIND and (blue)	The pilot may enter the wind (direction/velocity) at the reference waypoint and CRZ FL : This wind is used to compute the time from the aircraft position to the reference waypoint and to locate the equitime point itself. If no entry is made, the wind/velocity field will read zero.
[2R] and [4R] EPT TO XXX and (green)	This field displays the bearing distance and time from the equitime point (ETP) position to the reference waypoint.
[5R] ETP LOCATION	This field displays the ident of the next waypoint following the equitime point. The distance along the flight plan from the equitime point to the indicated waypoint is provided.
[6L] - [6R] A/C TO (ETP) DIST/UTC (green)	This field displays the distance and time from the current aircraft position to the equitime point along the flight plan. If at least one reference waypoint exists but no equitime point exists, the field is blank and NO ETP is displayed in 6L.

Note: *The assumptions for the equitime point computation include the cost index, speed managed (with SPD LIM), and winds.*
In case of engine-out, the EO LRC speed is considered.

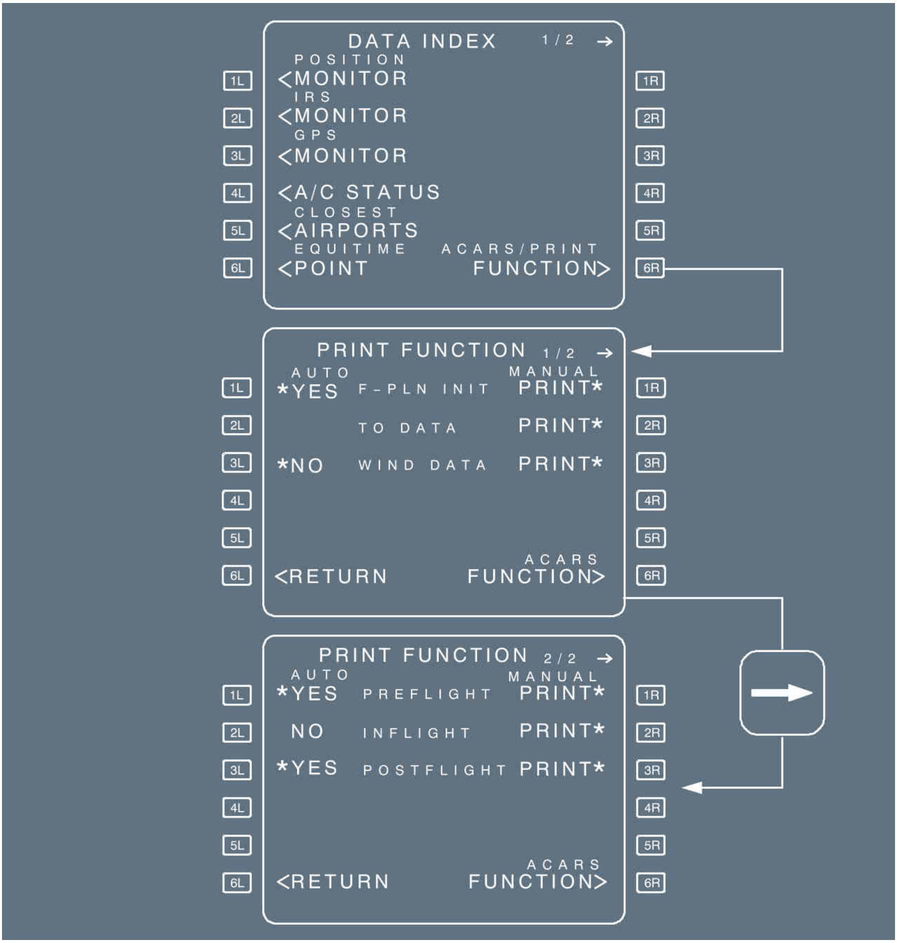
PRINT FUNCTION PAGES

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-L-00007085.0003001 / 14 MAY 12

GENERAL

The PRINT FUNCTION pages enable the pilot to print the active data relative to the current flight. The “PRINT FUNCTION” prompt is displayed on the DATA INDEX 1/2 page [6R] key, and gives access to the PRINT FUNCTION page 1 and 2.


DATA INDEX 1/2 →
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR
<A/C STATUS
CLOSEST
<AIRPORTS
EQUITIME
<POINT
ACARS/PRINT
FUNCTION>
PRINT FUNCTION 1/2 →
AUTO
MANUAL
*YES
F-PLN INIT
PRINT*
TO DATA
PRINT*
*NO
WIND DATA
PRINT*
<RETURN
ACARS
FUNCTION>
PRINT FUNCTION 2/2 →
AUTO
MANUAL
*YES
PREFLIGHT
PRINT*
NO
INFLIGHT
PRINT*
*YES
POSTFLIGHT
PRINT*
<RETURN
ACARS
FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Ident.: DSC-22_20-50-10-25-L-00007093.0002001 / 17 MAR 11

PRINT FUNCTION PAGE 1/2

The page displays the manual printing capabilities for
- the active flight plan data (line 1)
- the active takeoff data (line 2)
- the wind data (line 3)

LEFT COLUMN

AUTO (white)	
* YES (blue)	Line 1 : the uplinked flight plan INIT data are automatically printed when received. Line 2 : the uplinked takeoff data are automatically printed at uplink reception. Line 3 : the active wind data are automatically printed at uplink reception.
* NO (blue) :	The report displayed on the line is not automatically printed. The pilot can reactivate the function by pressing the left key of the line.
Blank :	The report displayed on the line is not automatically printed. The pilot cannot reactivate the function, but you can still print manually using the right hand key.
[6L] RETURN	Pressing this key reverts the display to the DATA INDEX page.

RIGHT COLUMN

MANUAL (white)	Displays the status of the manual printing capability of the active data (and not the ACARS uplink data).
PRINT * (amber)	Pressing the right keys prints the following active data : Line 1 : active flight plan init data. Line 2 : active takeoff data. Line 3 : active wind data. If the star is not displayed, the printing is not possible. When the key has been pressed, the star is removed until the data are printed.
[6R] ACARS FUNCTION	Pressing this key reverts the display to the ACARS FUNCTION page.

Ident.: DSC-22_20-50-10-25-L-00007121.0002001 / 17 MAR 11

PRINT FUNCTION PAGE 2/2

This page describes the printing capabilities of the reports displayed on line 1 to 3.

LEFT COLUMN

AUTO (white)	
* YES (blue)	Line 1 : the PREFLIGHT report is automatically printed at engine start. Line 2 : the INFLIGHT report is automatically printed at takeoff. Line 3 : the POSTFLIGHT report is automatically printed at engine shutdown.

* NO (blue)	The report displayed on the line is not automatically printed. The pilot can reactivate the function by pressing the left key of the line.
NO (without a star)	The automatic printing is deactivated internally for the report. The pilot cannot reactivate it.

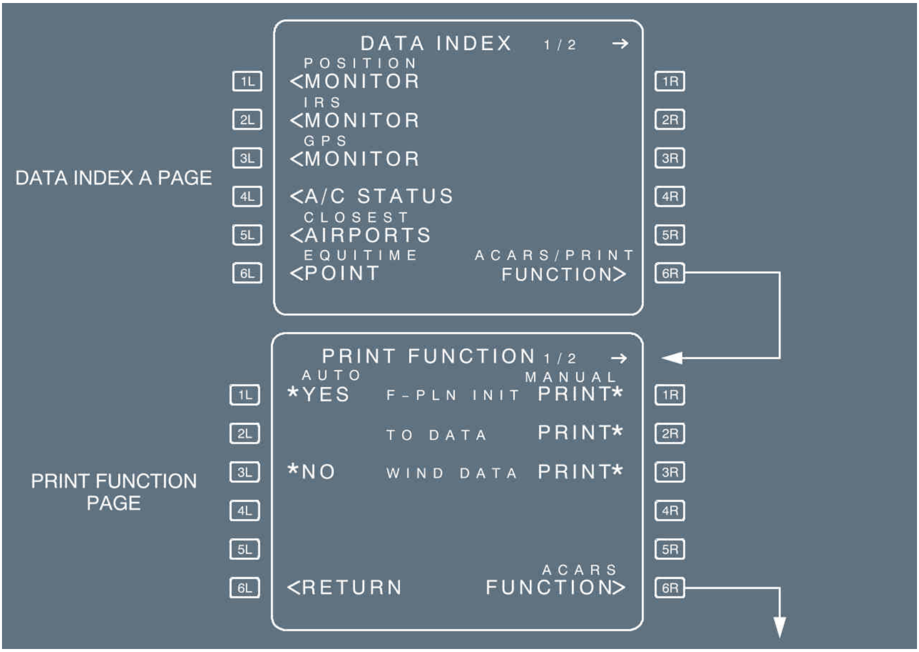
RIGHT COLUMN

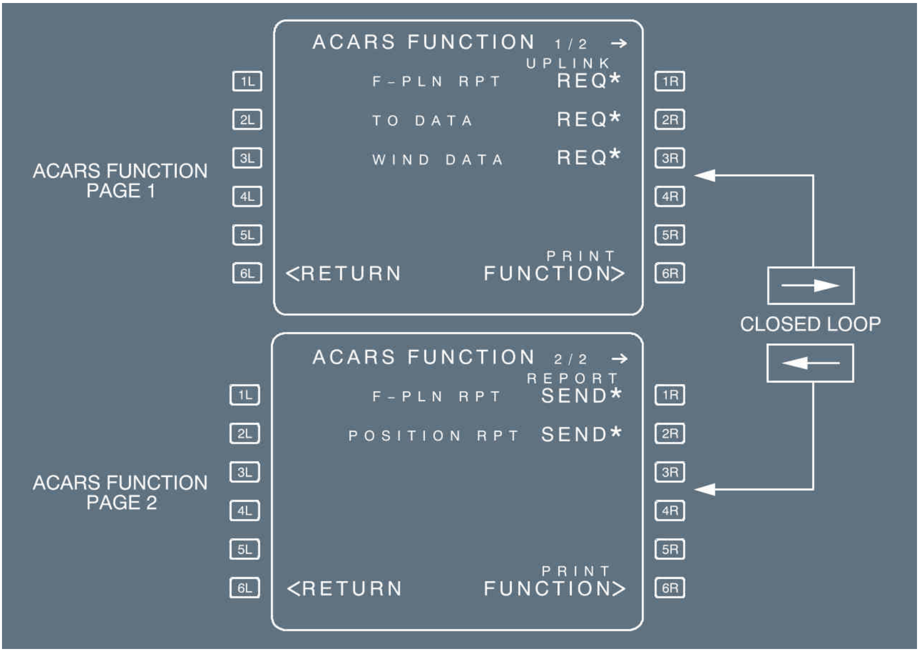
MANUAL	Pressing a right key prints the report displayed on the line.
PRINT *	If the star is not displayed, the printing is not possible. When the key is pressed, the star is removed until the report is printed.
[6R] ACARS FUNCTION	The crew presses this key to revert to the ACARS FUNCTION page.

ACARS FUNCTION PAGE

Ident.: DSC-22_20-50-10-25-00007124.0001001 / 14 MAY 12
Applicable to: ALL

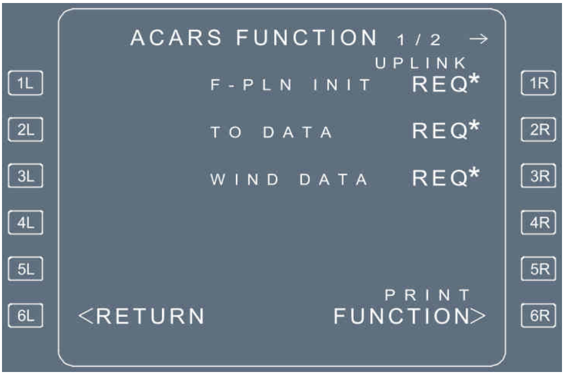
The ACARS FUNCTION pages display the functions that enable the pilot to send manual requests or reports to the ground.
All functions displayed on page 1 and 2 may be inhibited through a pin program of the navigation database policy file.
ACARS/PRINT FUNCTION prompt is displayed on the DATA INDEX page 1/2. Pressing this key displays the PRINT FUNCTION page from which the ACARS FUNCTION page can be accessed.


DATA INDEX A PAGE
DATA INDEX 1/2 →
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR
<A/C STATUS
CLOSEST
<AIRPORTS
EQUITIME
<POINT
ACARS/PRINT
FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
PRINT FUNCTION PAGE
PRINT FUNCTION 1/2 →
AUTO
MANUAL
*YES
F-PLN INIT
PRINT*
TO DATA
PRINT*
*NO
WIND DATA
PRINT*
ACARS
<RETURN
FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R


ACARS FUNCTION PAGE 1
ACARS FUNCTION 1/2 →
UPLINK
F-PLN RPT REQ*
TO DATA REQ*
WIND DATA REQ*
<RETURN
PRINT FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CLOSED LOOP
ACARS FUNCTION PAGE 2
ACARS FUNCTION 2/2 →
REPORT
F-PLN RPT SEND*
POSITION RPT SEND*
<RETURN
PRINT FUNCTION>

ACARS FUNCTION PAGE 1

Ident.: DSC-22_20-50-10-25-00007125.0001001 / 01 MAR 18
Applicable to: ALL


ACARS FUNCTION 1/2 →
UPLINK
F-PLN INIT REQ*
TO DATA REQ*
WIND DATA REQ*
<RETURN
PRINT FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

TITLE	ACARS FUNCTION 1/2 in white

Line 1 F-PLN INIT REQ*	Pressing this key sends a request for flight plan to the ground (downlink message). INIT REQUEST prompt of the INIT A page provides the same function.
Line 2 TO DATA REQ*	Pressing this key sends a request for takeoff data. Displayed in DONE and PREFLIGHT phases. TO DATA REQUEST prompt of the UPLINK TO DATA REQ page provides the same function.
Line 3 WIND DATA REQ*	Pressing this key sends a request for wind data. WIND REQUEST prompt of the CLIMB, CRUISE and DESCENT WIND pages provides the same function.

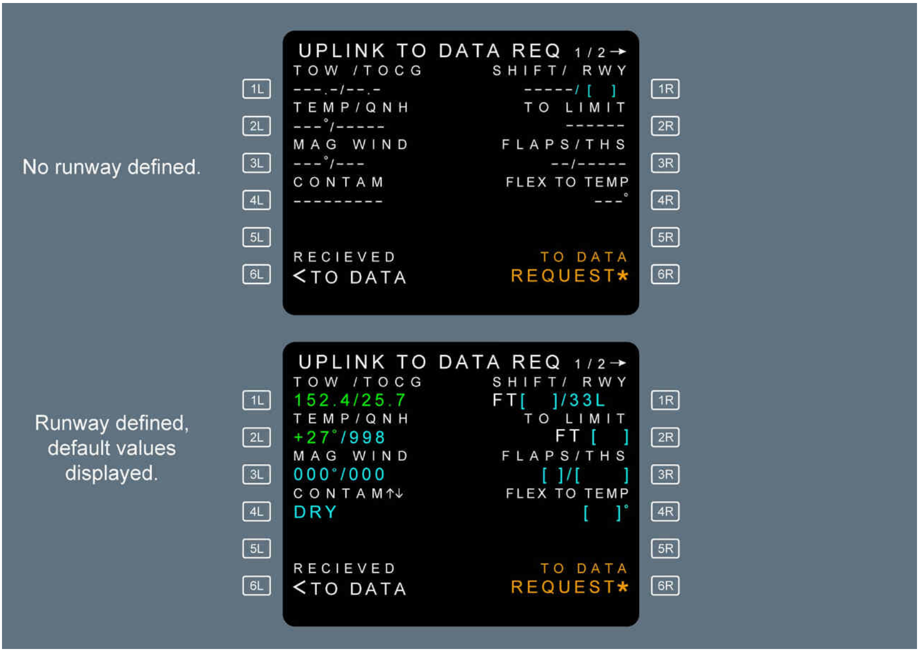
Note: *If "REQ" is not followed by a star, the request cannot be sent (downlink message).*
When a function (line 1 or 2 or 3) is deactivated using the navigation database policy file, the corresponding line is blank.

[6L] RETURN	The pilot presses this key to make the display revert to the DATA INDEX page.
[6R] PRINT FUNCTION	The pilot presses this key to access the PRINT FUNCTION page.

UPLINK TO DATA REQ PAGES

Ident.: DSC-22_20-50-10-25-00007127.0004001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

This page allows the flight crew to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or FLX or DRT) TO DATA page, by pressing the UPLINK TO DATA prompt.



No runway defined.

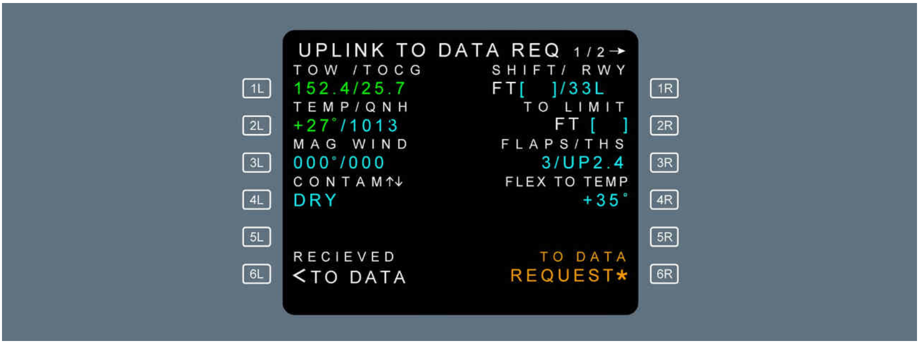
```
UPLINK TO DATA REQ  1/2→
TOW /TOCG         SHIFT/ RWY
---.-/--.-          -----/[  ]
TEMP/QNH            TO LIMIT
---°/-----            ------
MAG WIND           FLAPS/THS
---°/---             --/-----
CONTAM          FLEX TO TEMP
---------               ---°

RECIEVED             TO DATA
<TO DATA            REQUEST*
```

Runway defined, default values displayed.

```
UPLINK TO DATA REQ  1/2→
TOW /TOCG         SHIFT/ RWY
152.4/25.7        FT[   ]/33L
TEMP/QNH            TO LIMIT
+27°/998             FT [   ]
MAG WIND           FLAPS/THS
000°/000            [ ]/[   ]
CONTAM↑↓        FLEX TO TEMP
DRY                   [   ]°

RECIEVED             TO DATA
<TO DATA            REQUEST*
```

TITLE	The title appears in white.
[1L] TOW/TOCG	This field is dashed, until a runway is defined in the [1R] field. The TOW/TOCG are the values of the INIT FUEL PRED and FUEL PRED pages. If not available, dashes are displayed. They cannot be modified by the flight crew.
[2L] TEMP/QNH or QFE	This field is dashed until a runway is defined in the [1R] field. It displays the temperature at origin and baro setting. If the temperature is not defined, blue brackets are displayed, and the flight crew can modify the temperature according to the weather information. The baro setting is defaulted to FCU selection, and can be modified by the flight crew.
[3L] MAG WIND	This field is dashed, until a runway is defined in the [1R] field. It displays the wind at the origin. If the wind is not defined, blue brackets are displayed. The flight crew can modify this field.

[4L] CONTAM	This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY. The ↑ ↓ keys allow the flight crew to modify the runway contamination: DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.
[6L] RECEIVED TO DATA	This prompt calls up the UPLINK MAX (or FLX or DRT) TO DATA page that displays the data received by ACARS.



```
UPLINK TO DATA REQ 1/2→
TOW /TOCG              SHIFT/ RWY
152.4/25.7             FT[   ]/33L
TEMP/QNH                 TO LIMIT
+27°/1013                 FT [   ]
MAG WIND                FLAPS/THS
000°/000                  3/UP2.4
CONTAM↑↓             FLEX TO TEMP
DRY                          +35°

RECIEVED                  TO DATA
<TO DATA                 REQUEST*
```

[1R] SHIFT/RWY	This field is dashed until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled. SHIFT is value from PERF TO page or blue bracket if no value defined. RWY is F-PLN departure runway This field is modifiable by the flight crew.
[2 R] TO LIMIT	It is dashed until a runway is defined in [1R] field. It displays blue bracket when a runway is defined. The flight crew may enter a length considering obstacles on the runway.
[3R] FLAPS/THS	This field is dashed until a runway is defined in [1R] field; then defaulted to values from PERF TO page. Blue brackets are displayed if PERF TO page has no defined values.
[4R] FLEX TO TEMP	This field is dashed until a runway is defined in [1R] field; then it is defaulted to values from the PERF TO page. Blue bracket is displayed if PERF TO page has no defined values. This field is modifiable by the flight crew. The flight crew may enter a FLX TO temperature (FXX)
[6R] TO DATA REQUEST*	Pressing the key sends the takeoff data request message to the ground. The star disappears when the request is sent. The star is displayed again when data are available.

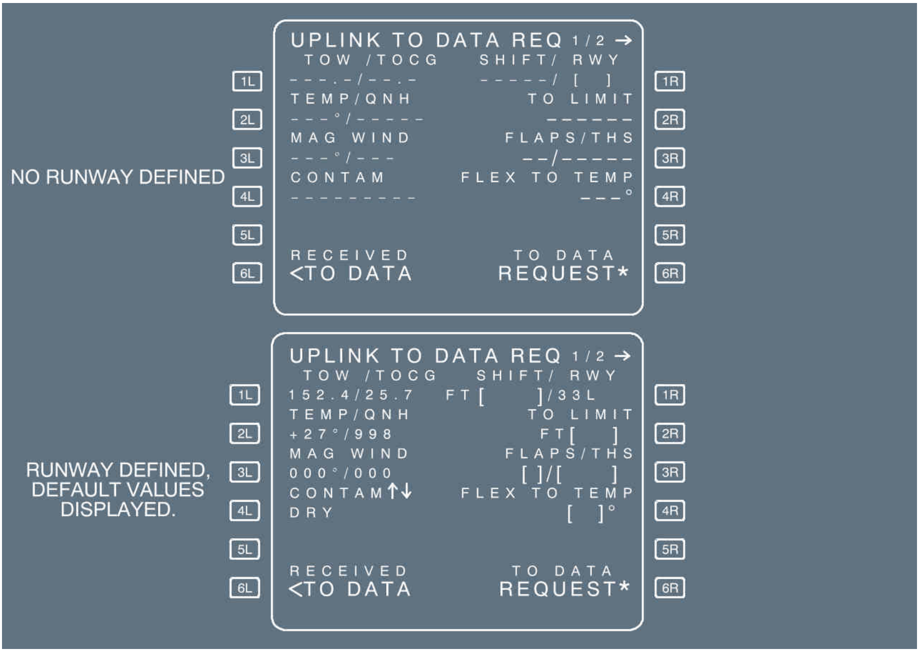
Page 2/2 is a page used for requesting a second runway data.

Note: *If the UPLINK TO DATA REQ page 2 is accessed (page 1 being filled), the fields of page 2 are filled with default values after entry of a runway in [1R]. QNH or QFE, temperature and wind are common with page 1.*

UPLINK TO DATA REQ PAGES

Ident.: DSC-22_20-50-10-25-00007127.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

This page allows the pilot to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or FLX or DRT) TO DATA page, by pressing the UPLINK TO DATA prompt.

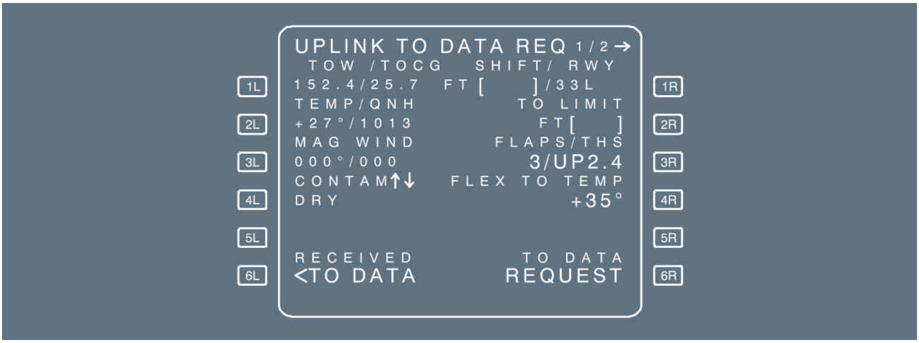


```
UPLINK TO DATA REQ 1/2 →
 TOW /TOCG          SHIFT/ RWY
---.-/--.-          -----/ [  ]
TEMP/QNH              TO LIMIT
---°/-----             -------
MAG WIND            FLAPS/THS
---°/---               --/-----
CONTAM            FLEX TO TEMP
---------                 ---°


RECEIVED              TO DATA
<TO DATA             REQUEST*
```

```
UPLINK TO DATA REQ 1/2 →
 TOW /TOCG          SHIFT/ RWY
152.4/25.7     FT[      ]/33L
TEMP/QNH              TO LIMIT
+27°/998                FT[   ]
MAG WIND            FLAPS/THS
000°/000              [ ]/[    ]
CONTAM↑↓          FLEX TO TEMP
DRY                      [  ]°

RECEIVED              TO DATA
<TO DATA             REQUEST*
```

TITLE	The title appears in white.
[1L] TOW/TOCG (green)	This field is dashed, until a runway is defined in the [1R] field. The TOW/TOCG are the values of the INIT B and FUEL PRED pages. If not available, dashes are displayed. They cannot be modified by the pilot.

[2L] TEMP/QNH or QFE (green/blue)	This field is dashed until a runway is defined in the [1R] field : TEMP = Defaulted to SAT ; cannot be modified by the crew. QNH or QFE = Defaulted to FCU selection, and can be modified by the pilot.
[3L] MAG WIND (blue)	This field is dashed, until a runway is defined in the [1R] field, and displays the wind at the origin. It can be modified by the pilot.
[4L] CONTAM (blue)	This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY. The slew keys allow the pilot to modify the runway contamination : DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.
[6L] RECEIVED TO DATA	This prompt calls up the UPLINK MAX (or FLX or DRT) TO DATA page that displays the data received by ACARS.



```
UPLINK TO DATA REQ 1/2→
 TOW /TOCG      SHIFT/ RWY
152.4/25.7   FT[    ]/33L
TEMP/QNH          TO LIMIT
+27°/1013           FT[  ]
MAG WIND         FLAPS/THS
000°/000           3/UP2.4
CONTAM↑↓      FLEX TO TEMP
DRY                   +35°

RECEIVED           TO DATA
<TO DATA           REQUEST
```

[1R] SHIFT/RWY (blue)	This field is dashed until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled: SHIFT = value from PERF TO page or blue bracket if no value defined. RWY = F-PLN departure runway This field is modifiable by the pilot.
[2 R] TO LIMIT (blue)	It is dashed until a runway is defined in [1R] field. It displays blue brackets [ ] when a runway is defined. The pilot may enter a length considering obstacles on the runway.
[3R] FLAPS/THS (blue)	This field is dashed until a runway is defined in [1R] field; then defaulted to values from PERF TO page. Blue brackets are displayed if PERF TO page has no defined values.

[4R] FLEX TO TEMP (blue)	This field is dashed until a runway is defined in [1R] field; then it is defaulted to values from the PERF TO page. Blue brackets are displayed if PERF TO page has no defined values. This field is modifiable by the pilot. The pilot may enter a FLEX TO temperature (FXX)
[6R] TO DATA REQUEST* (amber)	Pressing the key sends the takeoff data request message to the ground. The star disappears when the request is sent. The star is displayed again when data are available.

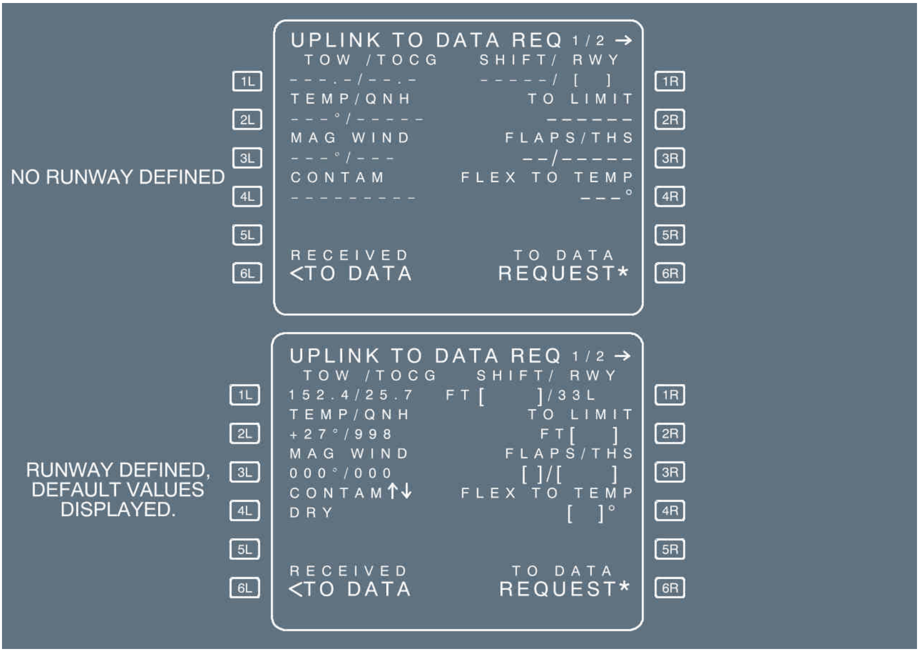
Page 2/2 is a page used for requesting a second runway data.

Note: - *If the UPLINK TO DATA REQ page 2 is accessed (page 1 being filled), the fields of page 2 are filled with default values after entry of a runway in [1R]. QNH or QFE and wind are common with page 1.*

UPLINK TO DATA REQ PAGES

Ident.: DSC-22_20-50-10-25-00007127.0003001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

This page allows the pilot to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or FLX or DRT) TO DATA page, by pressing the UPLINK TO DATA prompt.



NO RUNWAY DEFINED

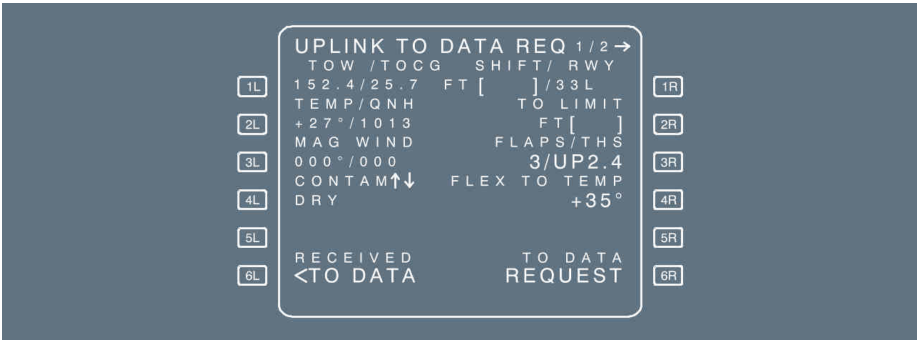
```
UPLINK TO DATA REQ 1/2 →
 TOW /TOCG      SHIFT/ RWY
---.-/--.-     -----/ [  ]
TEMP/QNH          TO LIMIT
---°/-----         -------
MAG WIND        FLAPS/THS
---°/---          --/-----
CONTAM        FLEX TO TEMP
---------             ---°

RECEIVED         TO DATA
<TO DATA        REQUEST*
```

RUNWAY DEFINED, DEFAULT VALUES DISPLAYED.

```
UPLINK TO DATA REQ 1/2 →
 TOW /TOCG      SHIFT/ RWY
152.4/25.7  FT[     ]/33L
TEMP/QNH          TO LIMIT
+27°/998           FT[   ]
MAG WIND        FLAPS/THS
000°/000          [ ]/[   ]
CONTAM↑↓      FLEX TO TEMP
DRY                  [  ]°

RECEIVED         TO DATA
<TO DATA        REQUEST*
```

TITLE	The title appears in white.
[1L] TOW/TOCG (green)	This field is dashed, until a runway is defined in the [1R] field. The TOW/TOCG are the values of the INIT B and FUEL PRED pages. If not available, dashes are displayed. They cannot be modified by the pilot.
[2L] TEMP/QNH or QFE (green/blue)	This field is dashed until a runway is defined in the [1R] field. It displays the temperature at origin and baro setting: TEMP = If the temperature is not defined, blue brackets are displayed, and the flight crew can modify this field according to the weather information. QNH or QFE = Defaulted to FCU selection, and can be modified by the flight crew.
[3L] MAG WIND (blue)	This field is dashed, until a runway is defined in the [1R] field. It displays the wind at the origin. If the wind is not defined, blue brackets are displayed. The flight crew can modify this field.

[4L] CONTAM (blue)	This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY. The slew keys allow the pilot to modify the runway contamination : DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.
[6L] RECEIVED TO DATA	This prompt calls up the UPLINK MAX (or FLX or DRT) TO DATA page that displays the data received by ACARS.


```
UPLINK TO DATA REQ 1/2→
 TOW /TOCG    SHIFT/ RWY
152.4/25.7  FT[    ]/33L
TEMP/QNH       TO LIMIT
+27°/1013         FT[   ]
MAG WIND      FLAPS/THS
000°/000        3/UP2.4
CONTAM↑↓  FLEX TO TEMP
DRY                +35°

RECEIVED        TO DATA
<TO DATA        REQUEST
```

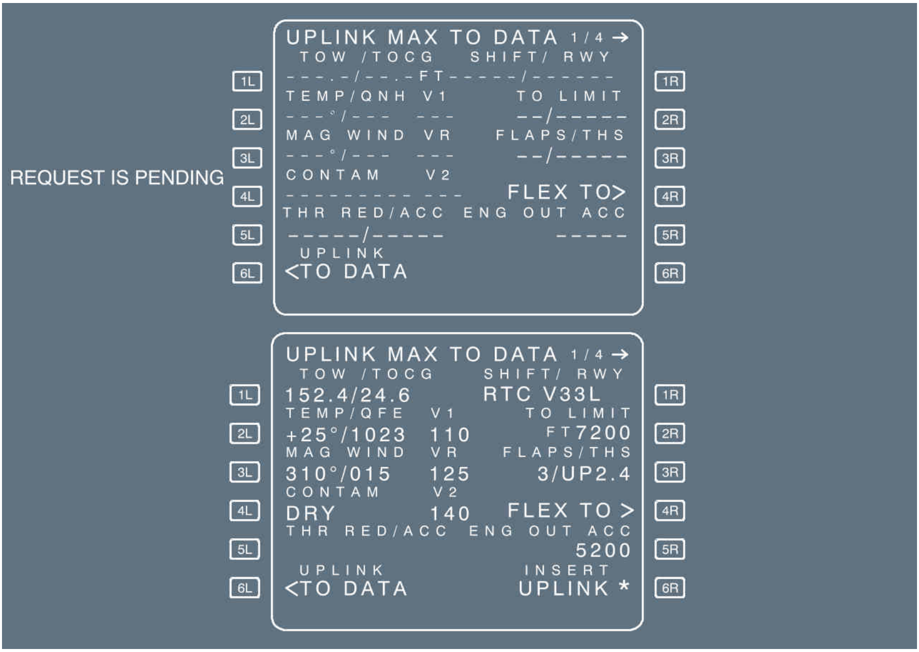
[1R] SHIFT/RWY (blue)	This field is dashed until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled: SHIFT = value from PERF TO page or blue bracket if no value defined. RWY = F-PLN departure runway This field is modifiable by the pilot.
[2 R] TO LIMIT (blue)	It is dashed until a runway is defined in [1R] field. It displays blue brackets [ ] when a runway is defined. The pilot may enter a length considering obstacles on the runway.
[3R] FLAPS/THS (blue)	This field is dashed until a runway is defined in [1R] field; then defaulted to values from PERF TO page. Blue brackets are displayed if PERF TO page has no defined values.
[4R] FLEX TO TEMP (blue)	This field is dashed until a runway is defined in [1R] field; then it is defaulted to values from the PERF TO page. Blue brackets are displayed if PERF TO page has no defined values. This field is modifiable by the pilot. The pilot may enter a FLEX TO temperature (FXX)
[6R] TO DATA REQUEST* (amber)	Pressing the key sends the takeoff data request message to the ground. The star disappears when the request is sent. The star is displayed again when data are available.

Page 2/2 is a page used for requesting a second runway data.

Note: - *If the UPLINK TO DATA REQ page 2 is accessed (page 1 being filled), the fields of page 2 are filled with default values after entry of a runway in [1R]. QNH or QFE, temperature and wind are common with page 1.*

UPLINK MAX TO DATA PAGES

Ident.: DSC-22_20-50-10-25-00007128.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP



```
UPLINK MAX TO DATA 1/4 →
 TOW /TOCG      SHIFT/ RWY
---.-/--.-FT-----/------
TEMP/QNH  V1       TO LIMIT
---°/---  ---      --/-----
MAG WIND  VR      FLAPS/THS
---°/---  ---      --/-----
CONTAM    V2
---------- ---     FLEX TO>
THR RED/ACC  ENG OUT ACC
-----/-----          -----
 UPLINK
<TO DATA
```

```
UPLINK MAX TO DATA 1/4 →
 TOW /TOCG       SHIFT/ RWY
152.4/24.6       RTC V33L
TEMP/QFE   V1       TO LIMIT
+25°/1023  110        FT7200
MAG WIND   VR      FLAPS/THS
310°/015   125       3/UP2.4
CONTAM     V2
DRY        140     FLEX TO >
THR RED/ACC  ENG OUT ACC
                       5200
 UPLINK              INSERT
<TO DATA           UPLINK *
```

This page is accessed from the UPLINK TO DATA REQ page by pressing the RECEIVED TO DATA key.
There is a set of 2 pages (MAX TO DATA and FLEX DRT TO DATA) for each of the 4 uplinked runway data. Uplinked data is displayed in green, and cannot be modified by the pilot.

[1L] TOW/TOCG	Uplinked reference takeoff gross weight, and takeoff center of gravity.
[2L] TEMP/QNH (or QFE)	Uplinked temperature and baro setting.

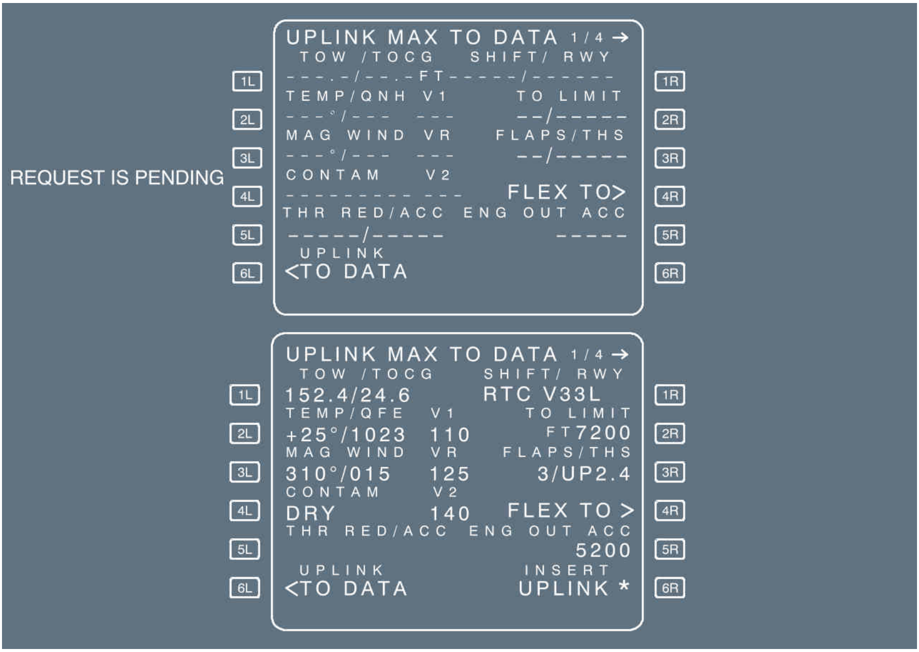
[3L] MAG (TRUE) WIND	Uplinked takeoff runway wind. MAG or TRUE, depending on the runway reference.
[4L] CONTAM	Uplinked takeoff runway contamination.
[5L] THR RED/ACC	Uplinked thrust reduction and acceleration altitudes.
[6L] UPLINK TO DATA	Pressing the key calls up the UPLINK TO DATA REQ page.
V1, VR, V2	Uplinked takeoff speeds.
[1R] SHIFT/RWY	Uplinked TO runway ident, runway intersection, and position shift.
[2R] TO LIMIT	Uplinked runway length remaining.
[3R] FLAPS/THS	Uplinked FLAPS/SLATS CONF and TRIM position.
[4R] FLEX TO	Pressing the key calls up the UPLINK FLEX (or DRT, if derated takeoff option) TO DATA pages.
[5R] ENG OUT ACC	Uplinked engine-out acceleration altitude.
[6R] INSERT UPLINK*	Uplinked takeoff data is available for insertion. Selecting this prompt inserts the following data in the FM : - V1, VR, V2 - THR RED/ACC, ENG OUT ACC altitudes - MAG WIND - FLAPS/THS - SHIFT - FLEX or DRT

The display reverts to the PERF TO page ; the asterisk disappears.
This field is not displayed, if the runway does not match the active runway, or if the uplinked TOW/TOCG differs from the current TOW/TOCG (if already existing). The “CHECK TAKEOFF DATA” message is displayed on the MCDU scratchpad.

Note: *All previously-received data is replaced by the new uplinked data.*

UPLINK MAX TO DATA PAGES

Ident.: DSC-22_20-50-10-25-00007128.0004001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



REQUEST IS PENDING

```
UPLINK MAX TO DATA 1/4 →
 TOW /TOCG      SHIFT/ RWY
---.-/--.-FT-----/------
TEMP/QNH  V1       TO LIMIT
---°/---  ---      --/-----
MAG WIND  VR      FLAPS/THS
---°/---  ---      --/-----
CONTAM    V2
--------- ---      FLEX TO>
THR RED/ACC  ENG OUT ACC
-----/-----           -----
 UPLINK
<TO DATA
```

```
UPLINK MAX TO DATA 1/4 →
 TOW /TOCG        SHIFT/ RWY
152.4/24.6       RTC V33L
TEMP/QFE    V1      TO LIMIT
+25°/1023   110       FT7200
MAG WIND    VR     FLAPS/THS
310°/015    125      3/UP2.4
CONTAM      V2
DRY         140    FLEX TO >
THR RED/ACC  ENG OUT ACC
                        5200
 UPLINK              INSERT
<TO DATA            UPLINK *
```

This page is accessed from the UPLINK TO DATA REQ page by pressing the RECEIVED TO DATA key.
There is a set of 2 pages (MAX TO DATA and FLEX DRT TO DATA) for each of the 4 uplinked runway data. Uplinked data is displayed in green, and cannot be modified by the pilot.

[1L] TOW/TOCG	Uplinked reference takeoff gross weight, and takeoff center of gravity.
[2L] TEMP/QNH (or QFE)	Uplinked temperature and baro setting.
[3L] MAG (TRUE) WIND	Uplinked takeoff runway wind. MAG or TRUE, depending on the runway reference.
[4L] CONTAM	Uplinked takeoff runway contamination.
[5L] THR RED/ACC	Uplinked thrust reduction and acceleration altitudes.
[6L] UPLINK TO DATA	Pressing the key calls up the UPLINK TO DATA REQ page.
V1, VR, V2	Uplinked takeoff speeds.

[1R] SHIFT/RWY	Uplinked TO runway ident, runway intersection, and position shift.
[2R] TO LIMIT	Uplinked runway length remaining.
[3R] FLAPS/THS	Uplinked FLAPS/SLATS CONF and TRIM position.
[4R] FLEX TO	Pressing the key calls up the UPLINK FLEX (or DRT, if derated takeoff ◁ option) TO DATA pages.
[5R] ENG OUT ACC	Uplinked engine-out acceleration altitude.
[6R] INSERT UPLINK*	Uplinked takeoff data is available for insertion.

Selecting this prompt inserts the following data on the PERF TO page :
- V1, VR, V2
- THR RED/ACC, ENG OUT ACC altitudes
- FLAPS/THS
- SHIFT
- FLEX or DRT ◁

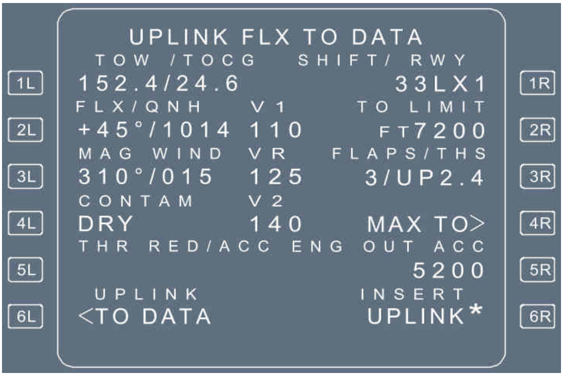
The display reverts to the PERF TO page and the selection star (*) disappears.
If the runway does not match the active runway, this field is not displayed.

If the runway matches the active runway but the uplinked TOW differs from the current TOW (the uplinked TOW is 3 t greater or 1 t lower than the TOW estimated by the FMS):
- The selection star (*) disappears and the insertion is not possible
- The TOW value is displayed in amber in [1L] field.

Note: *All previously-received data is replaced by the new uplinked data.*

UPLINK FLX (OR DRT) TO DATA PAGES

Ident.: DSC-22_20-50-10-25-00013003.0004001 / 17 MAR 11
Applicable to: ALL

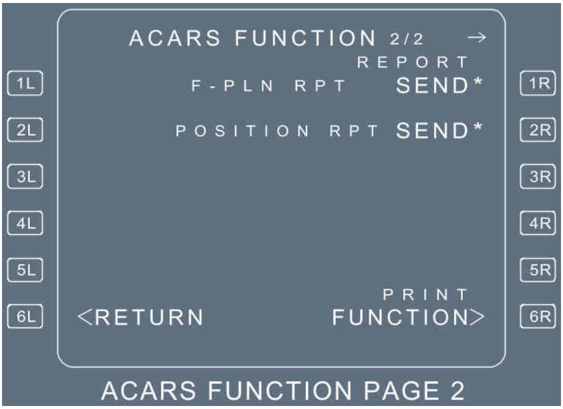


```
           UPLINK FLX TO DATA
  TOW /TOCG         SHIFT/ RWY
152.4/24.6                 33LX1
FLX/QNH      V1       TO LIMIT
+45°/1014   110         FT7200
MAG WIND     VR     FLAPS/THS
310°/015    125         3/UP2.4
CONTAM       V2
DRY         140         MAX TO>
THR RED/ACC ENG OUT ACC
                           5200
  UPLINK                INSERT
<TO DATA                UPLINK*
```

TITLE	UPLINK FLX TO DATA or UPLINK DRT TO DATA, if the derated takeoff function is installed, and if the pilot selected a derated takeoff.
[2L]	FLX (or DRT)/QNH (or QFE) When the UPLINK FLEX TO DATA page is selected, it displays uplink assumed Flex Temperature and BARO setting (QNH or QFE). When the UPLINK DRT TO DATA page is selected, this field displays DRT/BARO. If so, it displays the thrust rating and BARO setting (QNH or QFE).
[4R] MAX TO	Pressing this key calls up the MAX TO DATA page. For all other fields, refer to MAX TO DATA page.

ACARS FUNCTIONS PAGE 2

Ident.: DSC-22_20-50-10-25-00007134.0001001 / 10 DEC 09
Applicable to: ALL



ACARS FUNCTION 2/2 →
REPORT
F-PLN RPT SEND*
POSITION RPT SEND*
PRINT
<RETURN FUNCTION>

ACARS FUNCTION PAGE 2

Line 1 F-PLN RPT SEND	This key, when pressed, sends the flight plan report to the ground.
Line 2 POSITION RPT SEND	This key, when pressed, sends a Position Report to the ground.

Note:
- *No report can be sent if “SEND” is not followed by a star*
- *When a function (line 1 or 2) is deactivated through the navigation database policy file, the corresponding line is blank.*

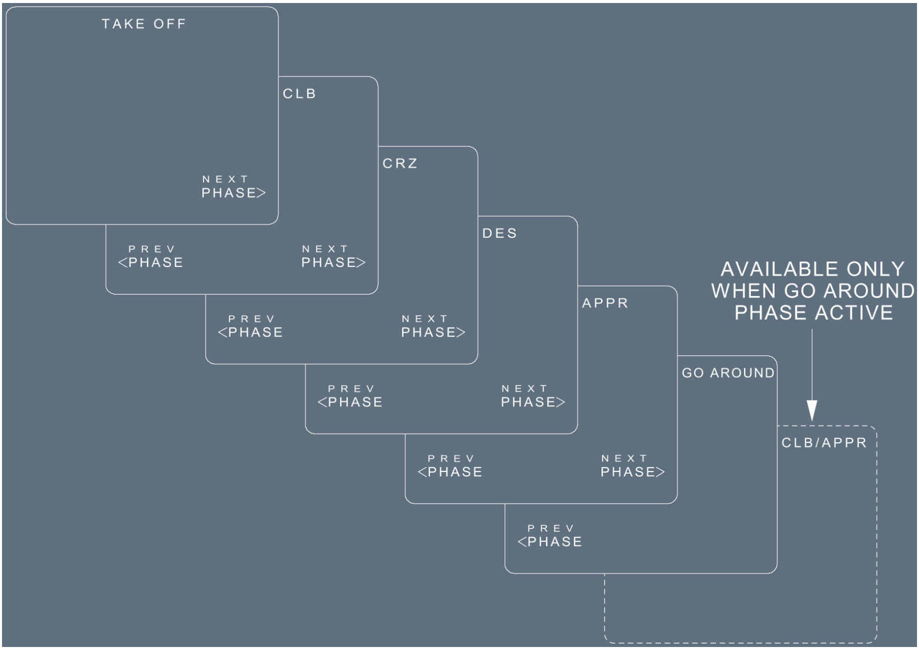
[6L] RETURN	The pilot presses this key to make the display revert to the DATA INDEX page.
[6R] PRINT FUNCTION	The pilot presses this key to access the PRINT FUNCTION page.

PERF PAGES

Ident.: DSC-22_20-50-10-25-00007142.0001001 / 17 MAR 11
Applicable to: ALL

The flight plan is divided into several phases :
PREFLIGHT - TAKEOFF - CLIMB - CRUISE - DESCENT - APPROACH - GO-AROUND - DONE
Each phase except the preflight and done phases has a performance (PERF) page. The PERF pages display performance data, speeds related to the various phases, and predictions.

Pressing the PERF key on the MCDU console calls up the performance page for the current active phase. Performance pages relating to phases already flown are not available.
In the preflight and done phases, pressing the PERF key brings up the takeoff performance page. Pressing the PERF key in the done phase makes the phase transition to the preflight phase.

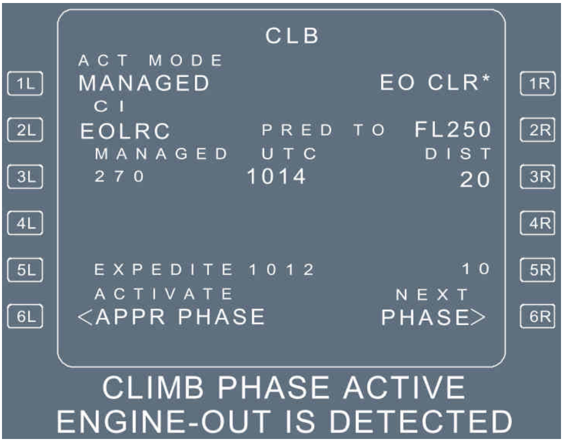

TAKE OFF
NEXT PHASE>
CLB
PREV <PHASE
NEXT PHASE>
CRZ
PREV <PHASE
NEXT PHASE>
DES
PREV <PHASE
NEXT PHASE>
APPR
PREV <PHASE
NEXT PHASE>
GO AROUND
PREV <PHASE
AVAILABLE ONLY WHEN GO AROUND PHASE ACTIVE
CLB/APPR

The FMGES flight phase are not related to the FWC phases.

Line 6	Fields may display two different prompts, depending upon whether the phase is active or not.
[6L] PREV PHASE	To review the performance page for the previous phase. The prompt is neither available on the takeoff performance page, nor for the phases already flown.
[6L] ACTIVATE APPR PHASE	To activate, then confirm, the APPR phase. Only available on the page corresponding to the active phase.
[6R] NEXT PHASE	To review the performance page for the next phase.

Note: ***Engine-out condition***

- *When the FMGES detects an engine-out condition, the system automatically calls up the performance page for the current flight phase (except when this occurs before the diversion point during takeoff or no EOSID exists in the flight plan) and displays "EO CLR*" in the [1R] field and "EO LRC" (engine-out long range cruise) in the [2L] field.*
  On the CLB, CRZ and DES (when the descent phase is not active) PERF pages, the pilot can enter a cost index value and overwrite to "EO LRC".
  Clearing the cost index reverts to EO LRC.
  If the pilot presses the [1R] key, the system reverts to the normal processing (with no engine failed) and suppresses the EO information. (Refer to DSC-22_20-30-10-05 General).
- *If the engine-out condition is detected before the diversion point at takeoff, a temporary flight plan is created.*



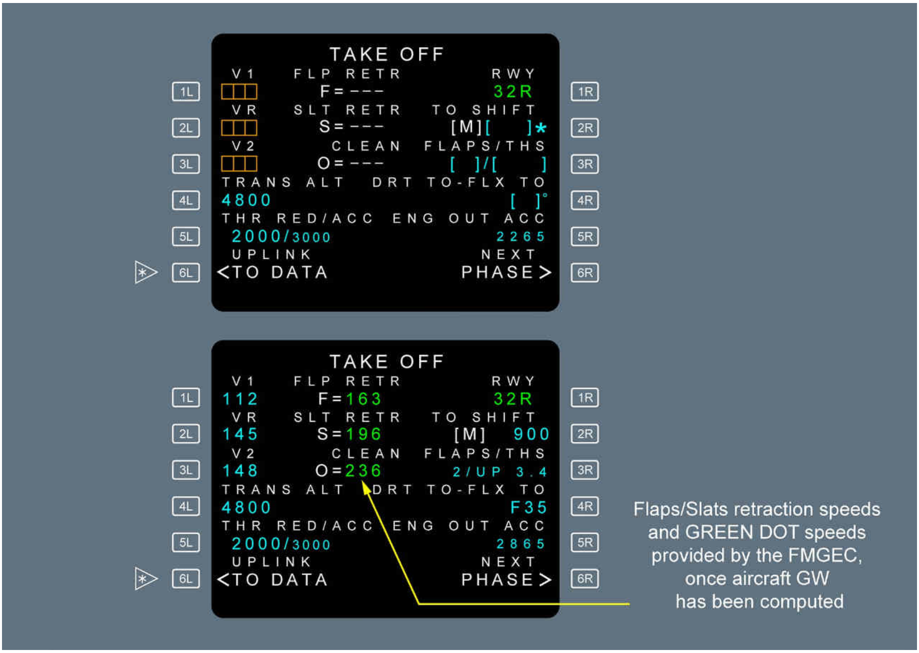
```
                CLB
ACT MODE
MANAGED                       EO CLR*
 CI
EOLRC          PRED TO        FL250
  MANAGED      UTC             DIST
  270          1014              20

  EXPEDITE 1012                  10
  ACTIVATE                     NEXT
<APPR PHASE                  PHASE>
```

CLIMB PHASE ACTIVE
ENGINE-OUT IS DETECTED

PERF TAKEOFF PAGE

Ident.: DSC-22_20-50-10-25-00007197.0003001 / 05 MAY 23
Applicable to: LV-GKO, LV-GKP

During the preflight phase, the flight crew presses the PERF key to call up the takeoff performance page.


TAKE OFF
V1 FLP RETR RWY
F=--- 32R
VR SLT RETR TO SHIFT
S=--- [M][ ]*
V2 CLEAN FLAPS/THS
O=--- [ ]/[ ]
TRANS ALT DRT TO-FLX TO
4800 [ ]°
THR RED/ACC ENG OUT ACC
2000/3000 2265
UPLINK NEXT
<TO DATA PHASE>
TAKE OFF
V1 FLP RETR RWY
112 F=163 32R
VR SLT RETR TO SHIFT
145 S=196 [M] 900
V2 CLEAN FLAPS/THS
148 O=236 2/UP 3.4
TRANS ALT DRT TO-FLX TO
4800 F35
THR RED/ACC ENG OUT ACC
2000/3000 2865
UPLINK NEXT
<TO DATA PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Flaps/Slats retraction speeds and GREEN DOT speeds provided by the FMGEC, once aircraft GW has been computed

TITLE

TAKE OFF appears, when the takeoff phase is active.
TAKE OFF appears, when the takeoff phase is inactive.

[1L] V1 [2L] VR [3L] V2

Amber boxes are displayed as long as no entries have been performed.
The flight crew can modify any entry, as long as the takeoff phase is inactive.

Note:
- *If the flight crew does not enter V2, the SRS mode will not be available at takeoff.*
- *If the flight crew enters V1, VR or V2 and the takeoff runway, or the takeoff shift, is changed, but the origin airport remains the same, the MCDU scratchpad displays CHECK TAKEOFF DATA. However, all the takeoff parameters are retained.*

[4L] TRANS ALT

This indicates the transition altitude.
The flight crew can call this up from the database after the origin airport is defined. The flight crew can modify it.

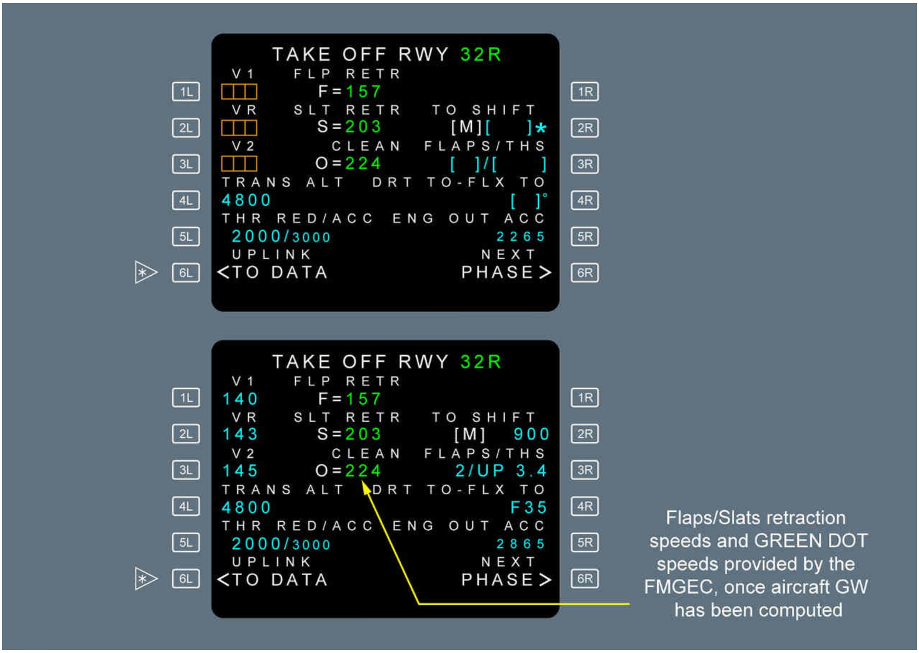
[5L] THR RED	This indicates the thrust reduction altitude. This is the altitude at which the flight crew should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative. - The default thrust reduction is 1 500 ft above the runway elevation. - The flight crew can modify this altitude: The minimum is 400 ft above the runway elevation.
ACC	This indicates the acceleration altitude. This is the altitude at which the climb phase is triggered. - The target speed jumps to the initial climb speed. - The default value is 1 500 ft above runway elevation. - The flight crew can modify the value. The minimum value is 400 ft above runway elevation. However, it is always higher than, or equal to, thrust reduction altitude. *Note:* - *A clearing action reverts both values to the default ones.* - *When the flight crew selects an altitude on the FCU that is:* • *Below ACC, it brings the ACC down to this altitude.* • *Below THR RED, it brings THR RED and ACC down to this altitude (the 400 ft minimum still applies).*
[6L] UPLINK TO DATA <*	This key calls up the UPLINK TO DATA REQ page. It is only displayed in the PREFLIGHT and DONE phases, when ACARS is installed.
[1R] RWY	This field shows the takeoff runway selected on the active flight plan. The flight crew cannot make an entry from this field. The field shows dashes, if no runway has been inserted in the flight plan.
[2R] TO SHIFT	The takeoff shift is the distance in meters or feet between the beginning of the runway and the aircraft's takeoff position. When taking off from an intersection, the flight crew should insert this value to ensure a correct update of the FM position. The takeoff shift value must be positive, and cannot be greater than the available takeoff run.
[3R] FLAPS/THS	This is an optional flight crew entry for the positions of the flaps and the THS at takeoff. The FLAP setting is used by the FWC to trigger the "FLAP/MCDU DISAGREE" ECAM caution. The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.

[4R] DRT TO-FLX TO	The flight crew may either insert the FLX TO temperature (i.e F45) for FLX takeoff setting purposes, or a Derated takeoff level (i.e. D04). It can only be entered during preflight. The system sends it to the FADEC, and displays it on the upper ECAM display. The TEMP value is always entered in degrees Celsius.
[5R] ENG OUT ACC	This indicates the engine-out acceleration altitude, as defined in the database, or as manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared. The above ACC rules of [5L], apply to this field.
[6R] NEXT PAGE	This key calls up the climb performance page.

PERF TAKEOFF PAGE

Ident.: DSC-22_20-50-10-25-00007197.0010001 / 05 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

During the preflight phase, the flight crew presses the PERF key to call up the takeoff performance page.


```
      TAKE OFF RWY 32R
 V1     FLP RETR
□□□      F=157
 VR     SLT RETR     TO SHIFT
□□□      S=203       [M][    ]*
 V2         CLEAN    FLAPS/THS
□□□      O=224       [  ]/[    ]
TRANS ALT    DRT TO-FLX TO
4800                    [  ]°
THR RED/ACC   ENG OUT ACC
 2000/3000              2265
 UPLINK                 NEXT
<TO DATA              PHASE>
```

```
      TAKE OFF RWY 32R
 V1     FLP RETR
140      F=157
 VR     SLT RETR     TO SHIFT
143      S=203       [M]   900
 V2         CLEAN    FLAPS/THS
145      O=224       2/UP 3.4
TRANS ALT    DRT TO-FLX TO
4800                    F35
THR RED/ACC   ENG OUT ACC
 2000/3000              2865
 UPLINK                 NEXT
<TO DATA              PHASE>
```

Flaps/Slats retraction speeds and GREEN DOT speeds provided by the FMGEC, once aircraft GW has been computed

TITLE	TAKE OFF RWY appears, when the takeoff phase is active. TAKE OFF RWY appears, when the takeoff phase is inactive. The active flight plan selected runway is displayed in large green font.

Note: *If the takeoff shift, or the flaps/THS, or the runway is changed after V1, VR or V2 insertion, but the origin airport remains the same, the MCDU CHECK TAKEOFF DATA message appears. All takeoff parameters are retained except in case of runway change. In case of runway change, the parameters are invalidated, but still displayed adjacent to each field. The “CONFIRM TO DATA” prompt in [6R] allows reverting to the previous valves.*

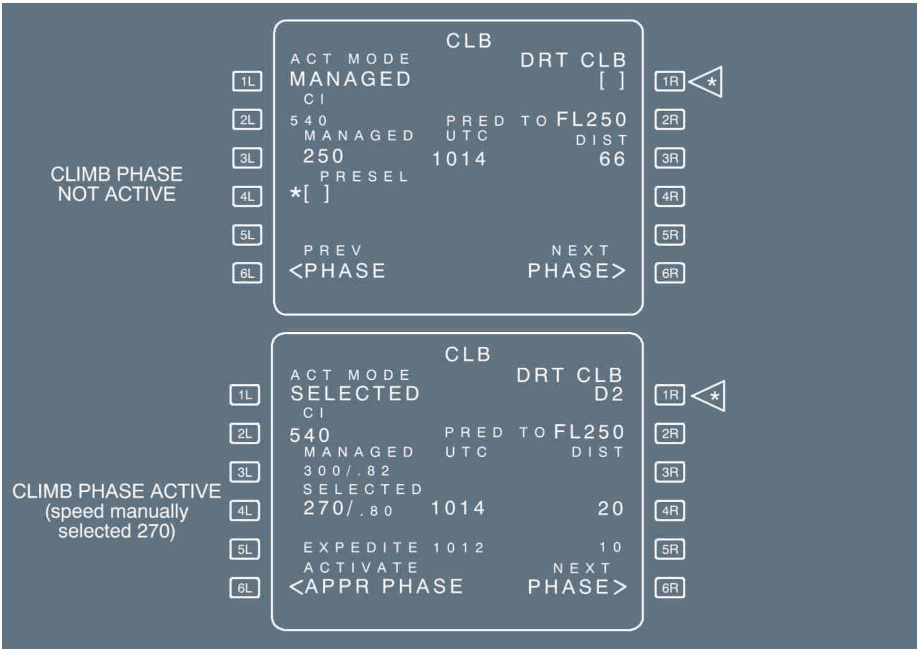
[1L] V1 [2L] VR [3L] V2	Amber boxes are displayed as long as no entries have been performed. The flight crew can modify any entry, as long as the takeoff phase is inactive. Note: *1. If the flight crew does not enter V2, the SRS mode will be unavailable at takeoff.* *2. The MCDU V1/VR/V2 DISAGREE message appears if the inserted V1, VR, V2 do not satisfy the condition: V1 ≤ VR ≤ V2.* *3. The MCDU TO SPEED TOO LOW message appears if the inserted V1, VR, V2 speeds do not satisfy the existing regulatory conditions regarding VMCG/VMCA and VS1G speeds.*
[4L] TRANS ALT	This indicates the transition altitude. This field displays the navigation database default altitude (if defined), once the origin airport is entered. The flight crew can modify it.
[5L] THR RED	This indicates the thrust reduction altitude. This is the altitude at which the flight crew should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative (“CLB” or “LVR CLB” flashing on the FMA). - The default thrust reduction altitude is 1 500 ft above the runway elevation, or the altitude set by the airline. - The flight crew can modify this altitude: The minimum is 400 ft above the runway elevation.

ACC	This indicates the acceleration altitude. This is the altitude at which the climb phase is triggered. - The target speed jumps to the initial climb speed. - The default value is 1 500 ft above runway elevation. - The flight crew can modify the value. The minimum value is 400 ft above runway elevation, and it can be higher than, equal to or lower than thrust reduction altitude. *Note:* - *A clearing action reverts both values to the default ones.* - *When the flight crew selects an altitude on the FCU that is:* • *Below ACC, it brings the ACC down to this altitude.* • *Below THR RED, it brings THR RED and ACC down to this altitude (the 400 ft minimum still applies).*
[6L] UPLINK TO DATA	This key calls up the UPLINK TO DATA REQ page. It is only displayed in the PREFLIGHT and DONE phases, when ACARS is installed.
[1R] EO CLR	EO CLR is displayed when an engine-out is detected when the active flight phase is Takeoff.
[2R] TO SHIFT	The takeoff shift is the distance in meters or feet between the beginning of the runway and the aircraft’s takeoff position. When taking off from an intersection, the flight crew should insert this value to ensure a correct update of the FM position. The takeoff shift value must be positive, and cannot be greater than the available takeoff run.
[3R] FLAPS/THS	This is a flight crew entry for the positions of the flaps and the THS at takeoff. The FLAP and THS setting are respectively used by the FWC to trigger the ”FLAP/MCDU DISAGREE” and “PITCH TRIM/MCDU/CG DISAGREE” ECAM cautions. The flight crew can modify it until takeoff, by entering “UP X.X” or “X.X UP”, or “DN X.X” or “X.X DN” for the THS.
[4R] DRT TO - FLX TO	The flight crew may either insert a FLX TO temperature (e.g. F45) for Flex Takeoff setting purposes, or a Derated Takeoff level (e.g. D04). The flight crew can enter it only during preflight. The system sends it to the FADEC, and displays it on the upper ECAM display. The TEMP value is always entered in degrees Celsius.
[5R] ENG OUT ACC	This indicates the engine-out acceleration altitude, as defined in the database, or as manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared. The above ACC rules of [5L] apply to this field.

[6R] NEXT PAGE or CONFIRM TO DATA*	This key calls up the climb performance page, or allows the flight crew to revert to the previously-entered T.O parameters in case of runway change with the same origin airport.

PERF CLIMB PAGE

Ident.: DSC-22_20-50-10-25-00007218.0001001 / 14 MAY 12
Applicable to: ALL


CLIMB PHASE NOT ACTIVE

```
              CLB
ACT MODE               DRT CLB
MANAGED                    [ ]
 CI
540           PRED  TO FL250
 MANAGED      UTC         DIST
 250          1014          66
  PRESEL
*[ ]

 PREV                   NEXT
<PHASE                 PHASE>
```

CLIMB PHASE ACTIVE (speed manually selected 270)

```
              CLB
ACT MODE              DRT CLB
SELECTED                   D2
 CI
540           PRED  TO FL250
 MANAGED      UTC         DIST
 300/.82
 SELECTED
 270/.80      1014          20

 EXPEDITE     1012          10
 ACTIVATE               NEXT
<APPR PHASE            PHASE>
```

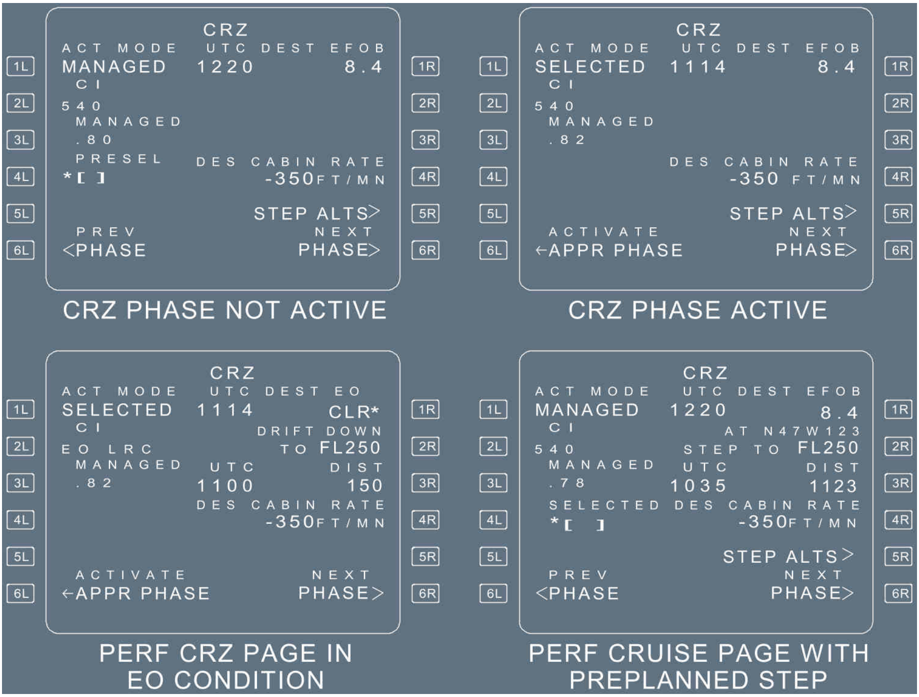
TITLE	CLB is displayed in large white fonts when the climb phase is inactive, and in large green fonts if it is active.
[1L] ACT MODE	This field displays the preselected active speed mode: SELECTED or MANAGED. The flight crew cannot modify it from this field.

[2L] CI (Cost Index)	This field displays the cost index, as initialized on the INIT A or defaulted from the database, or inserted in this field by the flight crew. *Note:* *In case of engine-out EO LRC (Engine-Out Long Range Cruise) replaces the CI field.* *You can enter a cost index and overwrite EO LRC. In this case, clearing the cost index reverts to EO LRC.*
[3L] MANAGED	This field displays the FMGES-computed ECON speed/Mach (*Refer to DSC-22_20-10 General*). Before the CLIMB phase is active, if the preselected speed mode is SELECTED, a star is displayed next to the MANAGED speed. In this case, pressing the 3L key preselects MANAGED speed, and 4L field reverts to brackets.
[4L] PRESEL or SELECTED	If the climb phase is not active: This field displays PRESEL, as long as the climb phase is not active. The flight crew can only enter a preselected speed. If the climb phase is active: The title of this field becomes SELECTED. This field displays the selected (or preselected) SPD or MACH target. The flight crew cannot directly modify it this field, but can adjust it with the SPD/MACH selection knob on the FCU. If the flight crew pushes in the FCU SPD/MACH selection knob to revert to managed speed, the system selects (or reselects) ECON SPD/MACH, and [4L] is blank.
[5L] Blank or EXPEDITE	This field is blank, as long as the climb phase is not active. This field displays this legend when the climb phase is active. The flight crew cannot engage EXPEDITE from this field. It indicates the time and distance required to reach the altitude displayed in the 2R field, in case of a climb at green dot.
[6L] PREV PHASE	This field displays this legend, if the climb phase is not active. The flight crew presses this key to call up the takeoff page.
[6L] ACTIVATE APPR PHASE	The field displays this legend, if the climb phase is active. Pressing this key once displays “CONFIRM APPR PHASE*”. Pressing it again activates the approach phase.
[1R] EO CLR or DRT CLB ◁	The system displays the EO CLR prompt, in case of an engine-out in climb, or DRT CLB when the crew selected a derated climb ◁ .

[2R] PRED TO...	This field displays the target altitude for the predictions shown in 3R, 4R, or 5L. It defaults to the FCU altitude, but the flight crew can modify it to any altitude below CRZ FL.
[3R] or [4R]	These fields show target altitude predictions selected in the [2R] field for the current vertical mode and target speed. [3R] field: Predictions for ECON speed (managed) [4R] field: Predictions for SPD manually selected These fields are only displayed while the takeoff, or climb phase is active.
[6R] NEXT PHASE	The pilot presses this key to call up the PERF CRZ page.

PERF CRUISE PAGE

Ident.: DSC-22_20-50-10-25-00007221.0003001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



```
              CRZ
ACT MODE     UTC  DEST  EFOB
MANAGED      1220        8.4
  CI
540
  MANAGED
  .80
  PRESEL     DES CABIN RATE
*[ ]             -350FT/MN
                STEP ALTS>
  PREV             NEXT
<PHASE            PHASE>
```

CRZ PHASE NOT ACTIVE

```
              CRZ
ACT MODE     UTC  DEST  EFOB
SELECTED     1114        8.4
  CI
540
  MANAGED
  .82
             DES CABIN RATE
                 -350 FT/MN
                STEP ALTS>
  ACTIVATE         NEXT
←APPR PHASE       PHASE>
```

CRZ PHASE ACTIVE

```
              CRZ
ACT MODE     UTC  DEST  EO
SELECTED     1114       CLR*
                 DRIFT DOWN
                   TO FL250
EO LRC
  MANAGED    UTC       DIST
  .82        1100       150
             DES CABIN RATE
                 -350FT/MN

  ACTIVATE          NEXT
←APPR PHASE        PHASE>
```

PERF CRZ PAGE IN EO CONDITION

```
              CRZ
ACT MODE     UTC  DEST  EFOB
MANAGED      1220        8.4
  CI              AT N47W123
540             STEP TO FL250
  MANAGED    UTC       DIST
  .78        1035      1123
  SELECTED   DES CABIN RATE
*[  ]            -350FT/MN
                STEP ALTS>
  PREV             NEXT
<PHASE            PHASE>
```

PERF CRUISE PAGE WITH PREPLANNED STEP

TITLE	CRZ in white large font, when cruise phase is not active, in green large font, when it is.

[1L] ACT MODE	This field shows the active speed/Mach target : SELECTED or MANAGED (ECON). The pilot cannot modify it through this field.
[2L] CI	This field shows the cost index as initialized on the init A page or defaulted from the database, or as inserted in this field by the crew. EO LRC replaces automatically the cost index value in case of engine out.
[3L] MANAGED	When the speed target is managed, the FMGES computes the ECON speed. This field displays the ECON speed/Mach : ECON is the optimum speed or Mach, in terms of time and fuel cost ratio, related to the active flight plan, weather, cruise flight level, and gross weight.
[4L] PRESEL or SELECTED	If cruise phase is not active: The pilot can enter a preselected speed or Mach number. If cruise phase is active: This field is blank.

Note: *When the cruise phase is not yet active, a * symbol appears next to the selectable speed (or Mach).*

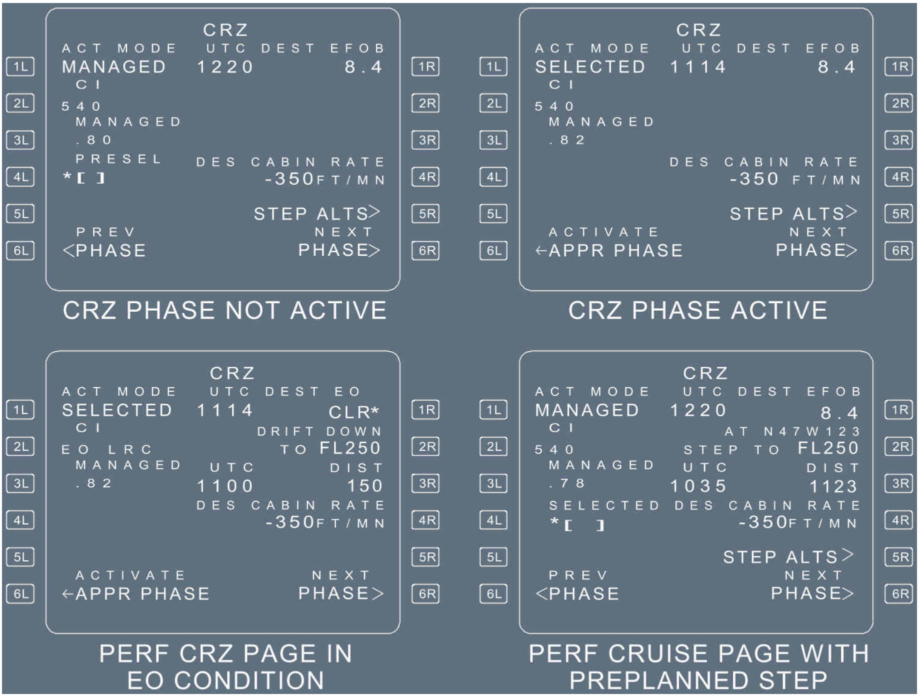
Note: *If the flight crew enters a value in the PRESEL field during the cruise altitude capture (ALT CRZ*), the FCU selected speed may revert to M 0.01.*

[6L] PREV PHASE or	The pilot can press this key to call up the climb page, if the cruise phase is not yet active.
[6L] ACTIVATE APPR PHASE	This field displays this legend if the cruise phase is active. The flight crew presses the key once to change the legend to “CONFIRM APPR PHASE*”. A second press activates the approach phase. Note: *If the pilot inadvertently activates the approach phase, it can reselect the cruise flight level into the progress page to reactivate the cruise phase.*
[1R] TIME/UTC DES EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time at destination (UTC). After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board at destination (DEST EFOB) in green font. The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.

[2R] STEP TO FL XX DRIFT DOWN TO FLXX, or TO T/D	This field, in combination with 3R, displays the predictions for the step point and the step altitude, the drift down altitude, or the Top of Descent.
[3R] TIME/UTC and DIST	This field displays the time and distance to go to the various points identified in 2R.
[4R] DES CABIN RATE	This field displays Max (computed DES cabin rate, maximum descent cabin rate). The pilot may modify the value : The FM then recomputes the top of descent, in order to match this value. If the FM cannot match the pilot entry, the FM-computed value overwrites the pilot entry. A clear action reverts to the default value (-350 ft/min). As DES CAB RATE is a negative value, “minus” is not a necessary entry.
[5R] STEP ALTS	This key calls up the STEP ALTS page (see vertical revision).
[6R] NEXT PHASE	This key calls up the DES page.

PERF CRUISE PAGE

Ident.: DSC-22_20-50-10-25-00007221.0001001 / 30 MAR 15
Applicable to: LV-GKO, LV-GKP



```
             CRZ
ACT MODE     UTC DEST  EFOB
MANAGED      1220       8.4
  CI
540
  MANAGED
 .80
  PRESEL     DES CABIN RATE
*[ ]              -350FT/MN

                 STEP ALTS>
  PREV                 NEXT
<PHASE               PHASE>
```

CRZ PHASE NOT ACTIVE

```
             CRZ
ACT MODE     UTC DEST  EFOB
SELECTED     1114       8.4
  CI
540
  MANAGED
 .82
             DES CABIN RATE
                  -350FT/MN

                 STEP ALTS>
  ACTIVATE             NEXT
←APPR PHASE          PHASE>
```

CRZ PHASE ACTIVE

```
             CRZ
ACT MODE     UTC DEST    EO
SELECTED     1114      CLR*
  CI             DRIFT DOWN
EO LRC           TO FL250
  MANAGED    UTC       DIST
 .82         1100       150
             DES CABIN RATE
                  -350FT/MN

  ACTIVATE             NEXT
←APPR PHASE          PHASE>
```

PERF CRZ PAGE IN EO CONDITION

```
             CRZ
ACT MODE     UTC DEST  EFOB
MANAGED      1220       8.4
  CI             AT N47W123
540          STEP TO  FL250
  MANAGED    UTC       DIST
 .78         1035      1123
  SELECTED   DES CABIN RATE
*[   ]            -350FT/MN
                 STEP ALTS>
  PREV                 NEXT
<PHASE               PHASE>
```

PERF CRUISE PAGE WITH PREPLANNED STEP

TITLE	CRZ in white large font, when cruise phase is not active, in green large font, when it is.
[1L] ACT MODE	This field shows the active speed/Mach target : SELECTED or MANAGED (ECON). The pilot cannot modify it through this field.
[2L] CI	This field shows the cost index as initialized on the init A page or defaulted from the database, or as inserted in this field by the crew. EO LRC replaces automatically the cost index value in case of engine out.

[3L] MANAGED	When the speed target is managed, the FMGES computes the ECON speed. This field displays the ECON speed/Mach : ECON is the optimum speed or Mach, in terms of time and fuel cost ratio, related to the active flight plan, weather, cruise flight level, and gross weight.
[4L] PRESEL or SELECTED	If cruise phase is not active: The pilot can enter a preselected speed or Mach number. If cruise phase is active: This field is blank.

Note: *When the cruise phase is not yet active, a * symbol appears next to the selectable speed (or Mach).*

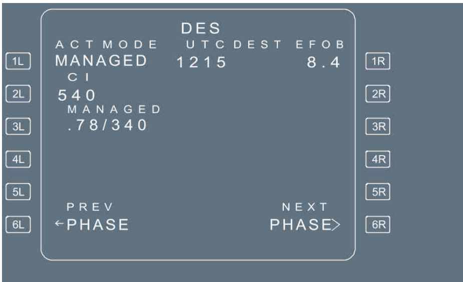
Note: *If the flight crew enters a value in the PRESEL field during the cruise altitude capture (ALT CRZ*), the FCU selected speed may revert to M 0.01.*

[6L] PREV PHASE or	The pilot can press this key to call up the climb page, if the cruise phase is not yet active.
[6L] ACTIVATE APPR PHASE	This field displays this legend if the cruise phase is active. The flight crew presses the key once to change the legend to “CONFIRM APPR PHASE*”. A second press activates the approach phase. Note: *If the pilot inadvertently activates the approach phase, it can reselect the cruise flight level into the progress page to reactivate the cruise phase.*
[1R] TIME/UTC DES EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time (UTC) at destination. After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board. EO CLR is displayed when an engine-out is detected.
[2R] STEP TO FL XX DRIFT DOWN TO FLXX, or TO T/D	This field, in combination with 3R, displays the predictions for the step point and the step altitude, the drift down altitude, or the Top of Descent.
[3R] TIME/UTC and DIST	This field displays the time and distance to go to the various points identified in 2R.

[4R] DES CABIN RATE	This field displays Max (computed DES cabin rate, maximum descent cabin rate). The pilot may modify the value : The FM then recomputes the top of descent, in order to match this value. If the FM cannot match the pilot entry, the FM-computed value overwrites the pilot entry. A clear action reverts to the default value (-350 ft/min). As DES CAB RATE is a negative value, “minus” is not a necessary entry.
[5R] STEP ALTS	This key calls up the STEP ALTS page (see vertical revision).
[6R] NEXT PHASE	This key calls up the DES page.

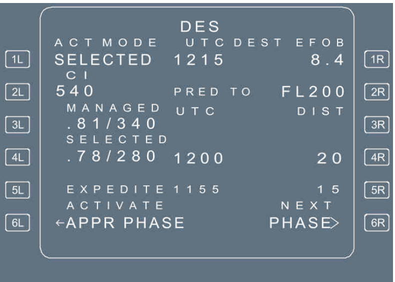
PERF DESCENT PAGE

Ident.: DSC-22_20-50-10-25-00007231.0004001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO



```
              DES
ACT MODE      UTC DEST   EFOB
MANAGED       1215        8.4
 CI
540
 MANAGED
.78/340



 PREV                   NEXT
←PHASE                 PHASE>
```

DES PHASE NOT ACTIVE WITH
MANAGED SPEED/MACH SELECTION



```
              DES
ACT MODE      UTC DEST   EFOB
SELECTED      1215        8.4
 CI
540           PRED TO   FL200
 MANAGED      UTC        DIST
.81/340
 SELECTED
.78/280       1200         20

 EXPEDITE     1155         15
 ACTIVATE                NEXT
←APPR PHASE             PHASE>
```

DES PHASE ACTIVE WITH
SELECTED SPEED/MACH

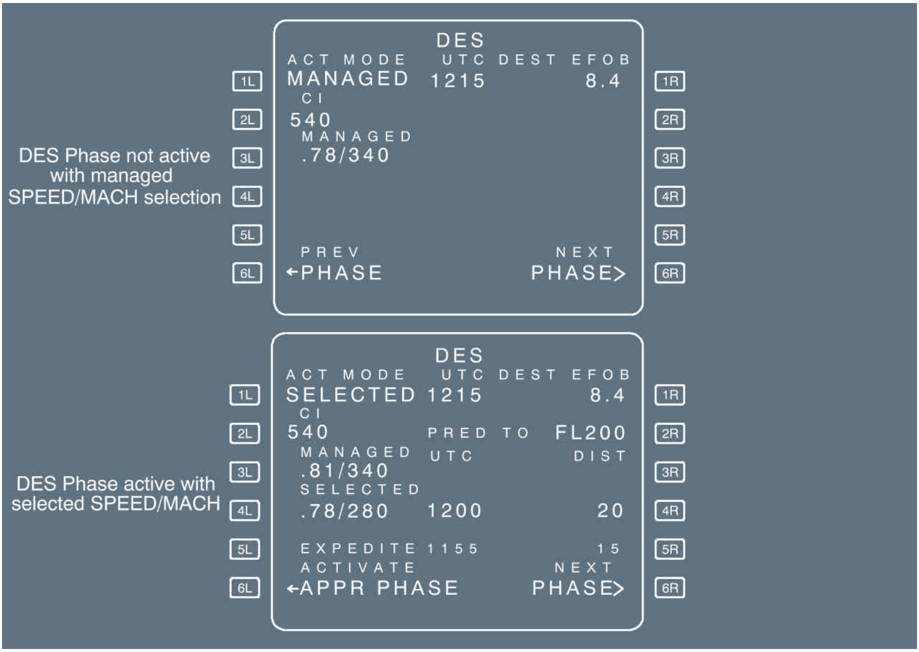
TITLE	DES in a white large font when the descent phase is not active and in a green large font, when it is active.
[1L] ACT MODE	This field displays the active speed target (MANAGED or SELECTED). The flight crew cannot modify it through this field.
[2L] CI	This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. The flight crew cannot modify it when the descent phase is active.

[3L] MANAGED	Before the flight crew makes any entry. This field displays MANAGED in white, with the associated ECON descent Mach or speed in blue. The crew may overwrite the ECON descent Mach or speed by entering a Mach number and/or a speed in this field. The system uses the pilot entry to compute the descent profile. The descent may be flown in managed using this new pilot entry. The flight crew can modify this field as follow: - enter only a new speed and keep the same managed Mach number (entry format: /XXX), or - enter a new target speed and enable the FMS to compute a new managed Mach number with the highest possible cross-over altitude (entry format: XXX), or - clear the entry to revert to ECON Mach/speed.
[4L] blank or [4L] MACH/SPD	If the descent phase is not active, this field is blank. If the descent phase is active : The field displays the speed or Mach target manually selected by the pilot. “SELECTED” is displayed in the [1L] field. To modify the field value, the pilot will use the SPD/MACH selector knob of the FCU. [4L] field and FCU window will display the same value. Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.
[5L] Blank or [5L] EXPEDITE	If the descent phase is not active this field is blank. If the descent phase is active, this field displays EXPEDITE, if EXPEDITE mode is selected on FCU. It indicates the time and distance required to reach the altitude displayed in the [2R] field at MMO/VMO speed. The flight crew cannot select the EXPEDITE mode through this field.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page if the descent phase is not yet active. Displays if the descent phase is active. First press causes “CONFIRM APPR PHASE” to be displayed. Second press activates the approach phase.

[1R] TIME/UTC	DEST EFOB Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time at destination (UTC). After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board at destination (DEST EFOB) in green font. The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.
[2R] PRED TO...	This field displays the target altitude for the predictions in [3R] [4R], or [5L] . The display defaults to the altitude selected on the FCU. The flight crew can modify it to any altitude lower than present altitude.
[3R]	These fields display altitude predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES) and the indicated target speed. [3R] field : shows predictions for the “MANAGED” SPD/MACH profile.
[4R]	[4R] field : displays predictions for a SPD/MACH. Fields [3R] and [4R] are displayed only when DES phase is active
[6R] NEXT PHASE	The pilot presses this key to call up the PERF APPR page.

PERF DESCENT PAGE

Ident.: DSC-22_20-50-10-25-00007231.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP



DES Phase not active with managed SPEED/MACH selection

```
                DES
ACT MODE     UTC  DEST  EFOB
MANAGED     1215         8.4
 CI
540
 MANAGED
 .78/340




 PREV                   NEXT
←PHASE                 PHASE>
```

DES Phase active with selected SPEED/MACH

```
                DES
ACT MODE     UTC  DEST  EFOB
SELECTED 1215            8.4
 CI
540          PRED TO   FL200
 MANAGED     UTC        DIST
 .81/340
 SELECTED
 .78/280     1200         20

 EXPEDITE 1155            15
 ACTIVATE               NEXT
←APPR PHASE            PHASE>
```

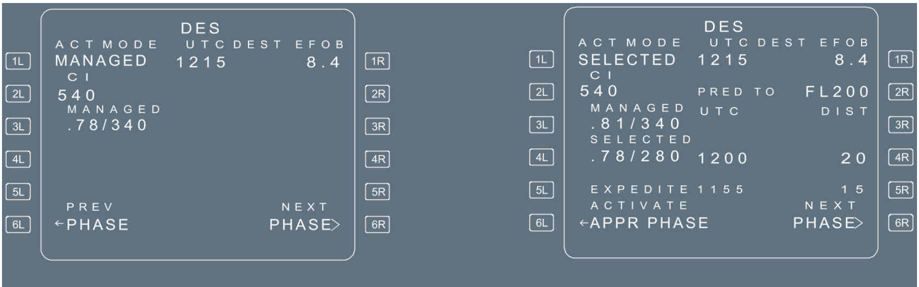
TITLE	DES in a white large font when the descent phase is not active and in a green large font, when it is active.
[1L] ACT MODE	This field displays the active speed target (MANAGED or SELECTED). The flight crew cannot modify it through this field.
[2L] CI	This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. The flight crew cannot modify it when the descent phase is active.

[3L] MANAGED	If the descent phase is not active : Before the flight crew makes any entry. This field displays MANAGED in white, with the associated ECON descent Mach or speed in blue. The crew may overwrite the ECON descent Mach or speed by entering a Mach number or a speed in this field. The system uses the pilot entry to compute the descent profile. The descent may be flown in managed using this new pilot entry. The entry is modifiable. It can be cleared to revert to ECON speed/Mach If the descent phase is active : The flight crew cannot make an entry in this field. The field displays the ECON speed/Mach or the speed/Mach value previously entered by the pilot.
[4L] blank or [4L] MACH/SPD	If the descent phase is not active, this field is blank. If the descent phase is active : The field displays the speed or Mach target manually selected by the pilot. “SELECTED” is displayed in the [1L] field. To modify the field value, the pilot will use the SPD/MACH selector knob of the FCU. [4L] field and FCU window will display the same value. Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.
[5L] Blank or [5L] EXPEDITE	If the descent phase is not active this field is blank. If the descent phase is active, this field displays EXPEDITE, if EXPEDITE mode is selected on FCU. It indicates the time and distance required to reach the altitude displayed in the [2R] field at MMO/VMO speed. The flight crew cannot select the EXPEDITE mode through this field.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page if the descent phase is not yet active. Displays if the descent phase is active. First press causes “CONFIRM APPR PHASE” to be displayed. Second press activates the approach phase.
[1R] TIME/UTC	DEST EFOB Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination. After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board.

[2R] PRED TO...	This field displays the target altitude for the predictions in [3R] [4R], or [5L] . The display defaults to the altitude selected on the FCU. The flight crew can modify it to any altitude lower than present altitude.
[3R]	These fields display altitude predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES) and the indicated target speed. [3R] field : shows predictions for the “MANAGED” SPD/MACH profile.
[4R]	[4R] field : displays predictions for a SPD/MACH. Fields [3R] and [4R] are displayed only when DES phase is active
[6R] NEXT PHASE	The pilot presses this key to call up the PERF APPR page.

PERF DESCENT PAGE

Ident.: DSC-22_20-50-10-25-00007231.0003001 / 21 MAR 17
Applicable to: LV-KHT, LV-KHU



DES
ACT MODE UTC DEST EFOB
MANAGED 1215 8.4
CI
540
MANAGED
.78/340
PREV NEXT
←PHASE PHASE>

DES
ACT MODE UTC DEST EFOB
SELECTED 1215 8.4
CI
540 PRED TO FL200
MANAGED UTC DIST
.81/340
SELECTED
.78/280 1200 20
EXPEDITE 1155 15
ACTIVATE NEXT
←APPR PHASE PHASE>

DES PHASE NOT ACTIVE WITH MANAGED SPEED/MACH SELECTION

DES PHASE ACTIVE WITH SELECTED SPEED/MACH

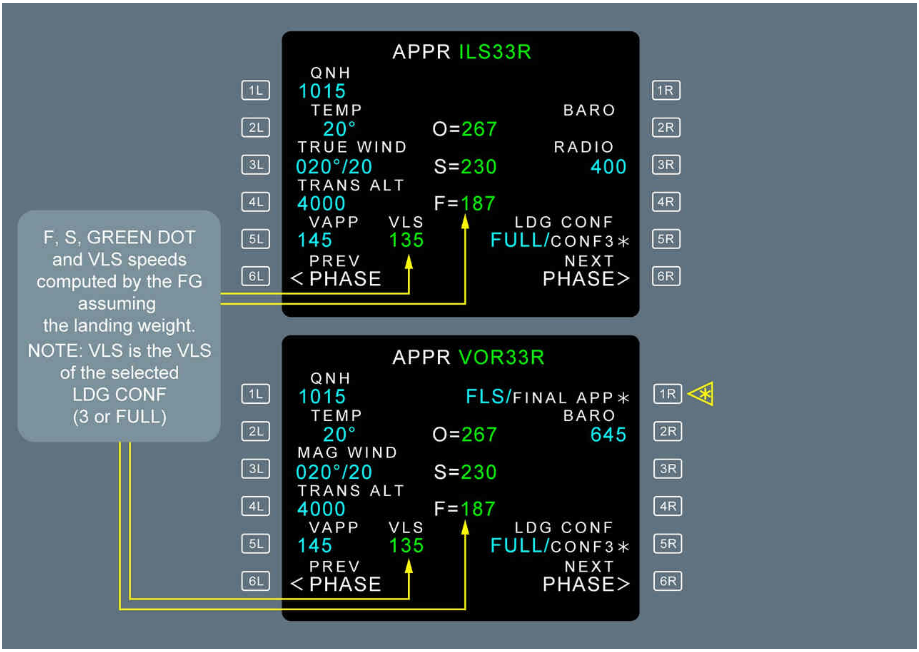
TITLE	DES in a white large font when the descent phase is not active and in a green large font, when it is active.
[1L] ACT MODE	This field displays the active speed target (MANAGED or SELECTED). The flight crew cannot modify it through this field.
[2L] CI	This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. The flight crew cannot modify it when the descent phase is active.

[3L] MANAGED	If the descent phase is not active : Before the flight crew makes any entry. This field displays MANAGED in white, with the associated ECON descent Mach or speed in blue. The crew may overwrite the ECON descent Mach or speed by entering a Mach number or a speed in this field. The system uses the pilot entry to compute the descent profile. The descent may be flown in managed using this new pilot entry. The entry is modifiable. It can be cleared to revert to ECON speed/Mach If the descent phase is active : The flight crew cannot make an entry in this field. The field displays the ECON speed/Mach or the speed/Mach value previously entered by the pilot.
[4L] blank or [4L] MACH/SPD	If the descent phase is not active, this field is blank. If the descent phase is active : The field displays the speed or Mach target manually selected by the pilot. “SELECTED” is displayed in the [1L] field. To modify the field value, the pilot will use the SPD/MACH selector knob of the FCU. [4L] field and FCU window will display the same value. Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.
[5L] Blank or [5L] EXPEDITE	If the descent phase is not active this field is blank. If the descent phase is active, this field displays EXPEDITE, if EXPEDITE mode is selected on FCU. It indicates the time and distance required to reach the altitude displayed in the [2R] field at MMO/VMO speed. The flight crew cannot select the EXPEDITE mode through this field.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page if the descent phase is not yet active. Displays if the descent phase is active. First press causes “CONFIRM APPR PHASE” to be displayed. Second press activates the approach phase.
[1R] TIME/UTC	DEST EFOB Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time at destination (UTC). After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board at destination (DEST EFOB) in green font. The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. EO CLR is displayed when an engine-out is detected.

[2R] PRED TO...	This field displays the target altitude for the predictions in [3R] [4R], or [5L] . The display defaults to the altitude selected on the FCU. The flight crew can modify it to any altitude lower than present altitude.
[3R]	These fields display altitude predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES) and the indicated target speed. [3R] field : shows predictions for the “MANAGED” SPD/MACH profile.
[4R]	[4R] field : displays predictions for a SPD/MACH. Fields [3R] and [4R] are displayed only when DES phase is active
[6R] NEXT PHASE	The pilot presses this key to call up the PERF APPR page.

PERF APPR PAGE

Ident.: DSC-22_20-50-10-25-00007237.0004001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO


APPR ILS33R
QNH
1015
TEMP
20°
TRUE WIND
020°/20
TRANS ALT
4000
VAPP
145
VLS
135
PREV
< PHASE
O=267
S=230
F=187
BARO
RADIO
400
LDG CONF
FULL/CONF3*
NEXT
PHASE>
APPR VOR33R
QNH
1015
TEMP
20°
MAG WIND
020°/20
TRANS ALT
4000
VAPP
145
VLS
135
PREV
< PHASE
FLS/FINAL APP*
BARO
645
O=267
S=230
F=187
LDG CONF
FULL/CONF3*
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

F, S, GREEN DOT and VLS speeds computed by the FG assuming the landing weight.
NOTE: VLS is the VLS of the selected LDG CONF (3 or FULL)

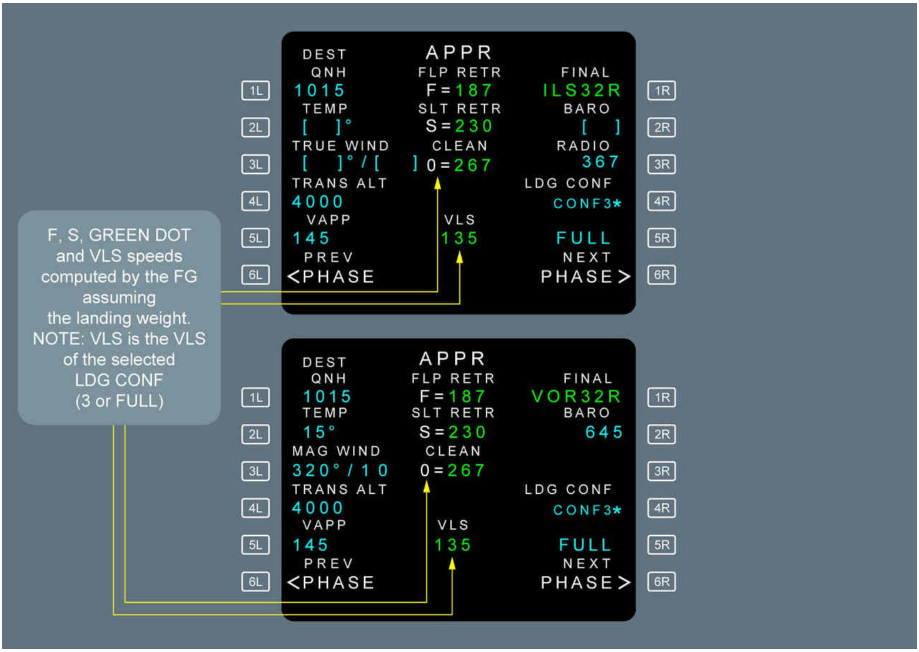
TITLE	The page title displays: - APPR, if the Approach phase is not active or APPR, if the Approach phase is active, and - The identification of the selected approach.
[1L] QNH	This field displays brackets when the aircraft is more than 180 NM from the destination. Inside 180 NM, mandatory amber boxes appear. The flight crew must enter the QNH in hectopascals (hPa) or in inches of mercury (inHg). The value is either entered in hPa or inHg: - For hPa, enter three or four digits, within the allowable range for hPa, or - For inHg, enter the four digits of the desired value with or without a decimal point, within the allowable range for inHg. The system interprets: - 1003 as 1 003 hPa - 2900 as 29.00 inHg - 29.92 as 29.92 inHg. The flight crew can modify this entry at any time. *Note:* *An erroneous entry of an OAT or BARO minimum in QNH field (e.g. 22 °C or 2 200 ft) is accepted by the system. As a consequence, the CPC computes an erroneous cabin pressurization segment during descent, then may trigger a pressurization ECAM alert.*
[2L] TEMP	This field displays the temperature at destination. Until the flight crew enters the temperature, the field displays brackets. The flight crew can modify this figure. The system uses this temperature to refine its computation of the descent profile (ISA model).
[3L] MAG WIND or TRUE WIND	The flight crew enters the wind speed in knots at the destination in this field. The reference of the wind entry is magnetic or true, depending on the airport's reference. The system transmits any entry made in this field to the DESCENT WIND page (which displays wind direction as true, not magnetic, whatever the airport's reference is).
[4L] TRANS ALT	This field displays the transition altitude taken from the database (small font) or entered by the flight crew (large font). The flight crew can modify it at any time.

[5L] VAPP	The FMGEC computes this approach speed, using the formula: VAPP = VLS + 1/3 of the headwind component (1/3 of the headwind component is limited to 5 kt as a minimum and 15 kt as a maximum). The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. _Note:_ *VLS = 1.23 VS1G of the selected landing configuration (FULL or 3).*
[6L] PREV PAGE	This field displays this legend if the approach phase is not active. Pressing this key calls up the PERF DES page.
[1R] FLS/FINAL APP * ◁	This field displays only with the FLS/FINAL APP - Coexistence ◁ . This field enables the flight crew to select FLS or FINAL APP as a guidance mode for the non precision approach selected in the ARRIVAL page. The selected guidance mode is displayed in cyan large font. The other guidance mode is displayed in white small font. If the key is pressed, the CONFIRM FINAL APP or CONFIRM FLS prompt appears. The flight crew must press the key to confirm the choice. _Note:_ *1. FLS is the default mode for non precision approach.* *2. The use of the FINAL APP mode should be restricted to RNAV(RNP) approach.*
[2R] BARO	This field displays: - The MDA with associated brackets, or - The MDH with associated brackets, if the aircraft is equipped with QFE ◁ option. The flight crew inserts the value, which can be modified at any time. If the flight crew makes an entry in [3R] field or changes the approach, it clears this figure. The BARO range is 0 to 5 000 ft above landing elevation.
[3R] RADIO	If the flight plan includes an ILS or GLS ◁ approach, this field displays RADIO and empty brackets. For a CAT II or CAT III approach, the flight crew inserts the decision height. The system will accept an entry of NO, NODH or NO DH. If the flight crew inserts a BARO value in [2R] field, this erases the decision height, and this field reverts to brackets. The RADIO range is 0 to 700 ft.
[4R] Blank or EO CLR	When the flight phase is Approach and an engine-out is active, the EO CLR prompt appears. The flight crew can deactivate the engine-out mode by pressing the key.

[5R] LDG CONF FULL/CONF 3	The flight crew can use this key to select the landing configuration. CONF FULL is the default landing configuration. The selected configuration is displayed in first position. The configuration that is not selected is displayed in second position.
[6R] NEXT PHASE	Pressing this key calls up the PERF GO AROUND page.

PERF APPR PAGE

Ident.: DSC-22_20-50-10-25-00007237.0003001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU



APPR
DEST QNH 1015
TEMP [ ]°
TRUE WIND [ ]°/[ ]
TRANS ALT 4000
VAPP 145
<PHASE PREV
FLP RETR F=187
SLT RETR S=230
CLEAN O=267
VLS 135
FINAL ILS32R
BARO [ ]
RADIO 367
LDG CONF CONF3*
FULL
NEXT PHASE>

APPR
DEST QNH 1015
TEMP 15°
MAG WIND 320°/10
TRANS ALT 4000
VAPP 145
<PHASE PREV
FLP RETR F=187
SLT RETR S=230
CLEAN O=267
VLS 135
FINAL VOR32R
BARO 645
LDG CONF CONF3*
FULL
NEXT PHASE>

F, S, GREEN DOT and VLS speeds computed by the FG assuming the landing weight.
NOTE: VLS is the VLS of the selected LDG CONF (3 or FULL)

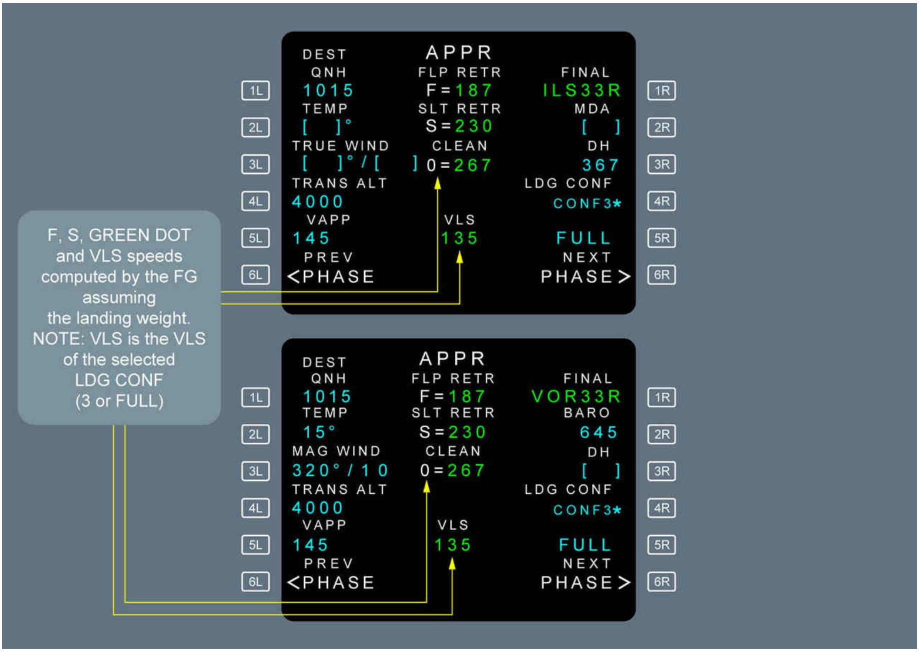
TITLE	The page title displays APPR, if the Approach phase is not active or APPR, if the Approach phase is active.

[1L] QNH	This field displays brackets when the aircraft is more than 180 NM from the destination. Inside 180 NM, mandatory amber boxes appear. The flight crew must enter the QNH in hectopascals (hPa) or in inches of mercury (inHg). The value is either entered in hPa or inHg: - For hPa, enter three or four digits within the allowable range for hPa, or - For inHg, enter the two digits of the desired value or two digits followed by a decimal point and two additional digits, within the allowable range for inHg. The system interprets: - 1003 as 1 003 hPa - 29 as 29.00 inHg - 29.92 as 29.92 inHg. The flight crew can modify this entry at any time. Note: *An erroneous entry of an OAT or BARO minimum in QNH field (e.g. 22 °C or 2 200 ft) is accepted by the system. As a consequence, the CPC computes an erroneous cabin pressurization segment during descent, then may trigger a pressurization ECAM alert.*
[2L] TEMP	This field displays the temperature at destination. Until the flight crew enters the temperature, the field displays brackets. The flight crew can modify this figure. The system uses this temperature to refine its computation of the descent profile (ISA model).
[3L] MAG WIND or TRUE WIND	The flight crew enters the wind speed in knots at the destination in this field. The reference of the wind entry is magnetic or true, depending on the airport's reference. The system transmits any entry made in this field to the DESCENT WIND page (which displays wind direction as true, not magnetic, whatever the airport's reference is).
[4L] TRANS ALT	This field displays the transition altitude taken from the database (small font) or entered by the flight crew (large font). The flight crew can modify it at any time.

[5L] VAPP	The FMGEC computes this approach speed, using the formula: VAPP = VLS + 1/3 of the headwind component (1/3 of the headwind component is limited to 5 kt as a minimum and 15 kt as a maximum). The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. *Note:* *VLS = 1.23 VS1G of the selected landing configuration (FULL or 3).*
[6L] PREV PAGE	This field displays this legend if the approach phase is not active. Pressing this key calls up the PERF DES page.
[1R] FINAL	This field displays the approach specified in the flight plan. The flight crew cannot modify it through this field.
[2R] BARO	This field displays: - The MDA with associated brackets, or - The MDH with associated brackets, if the aircraft is equipped with QFE ◁ option. The flight crew inserts the value, which can be modified at any time. If the flight crew makes an entry in [3R] field or changes the approach, it clears this figure. The BARO range is 0 to 5 000 ft above landing elevation.
[3R] RADIO	If the flight plan includes an ILS or GLS ◁ approach, this field displays RADIO and empty brackets. For a CAT II or CAT III approach, the flight crew inserts the decision height. The system will accept an entry of NO, NODH or NO DH. If the flight crew inserts a BARO value in [2R] field, this erases the decision height, and this field reverts to brackets. The RADIO range is 0 to 700 ft.
[4R] LDG CONF CONF 3	The flight crew can select CONF 3 by pressing this key. This moves the * down to the [5R] field, that displays FULL.
[5R] FULL	The flight crew can use this key to select CONF FULL when necessary. CONF FULL is the default landing configuration.
[6R] NEXT PHASE	Pressing this key calls up the PERF GO AROUND page.

PERF APPR PAGE

Ident.: DSC-22_20-50-10-25-00007237.0001001 / 10 MAY 21
Applicable to: LV-GKO, LV-GKP


DEST
APPR
QNH
FLP RETR
FINAL
1015
F=187
ILS33R
TEMP
SLT RETR
MDA
[ ]°
S=230
[ ]
TRUE WIND
CLEAN
DH
[ ]°/[ ]
O=267
367
TRANS ALT
LDG CONF
4000
CONF3*
VAPP
VLS
145
135
FULL
PREV
NEXT
<PHASE
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
DEST
APPR
QNH
FLP RETR
FINAL
1015
F=187
VOR33R
TEMP
SLT RETR
BARO
15°
S=230
645
MAG WIND
CLEAN
DH
320°/10
O=267
[ ]
TRANS ALT
LDG CONF
4000
CONF3*
VAPP
VLS
145
135
FULL
PREV
NEXT
<PHASE
PHASE>

F, S, GREEN DOT and VLS speeds computed by the FG assuming the landing weight.
NOTE: VLS is the VLS of the selected LDG CONF (3 or FULL)

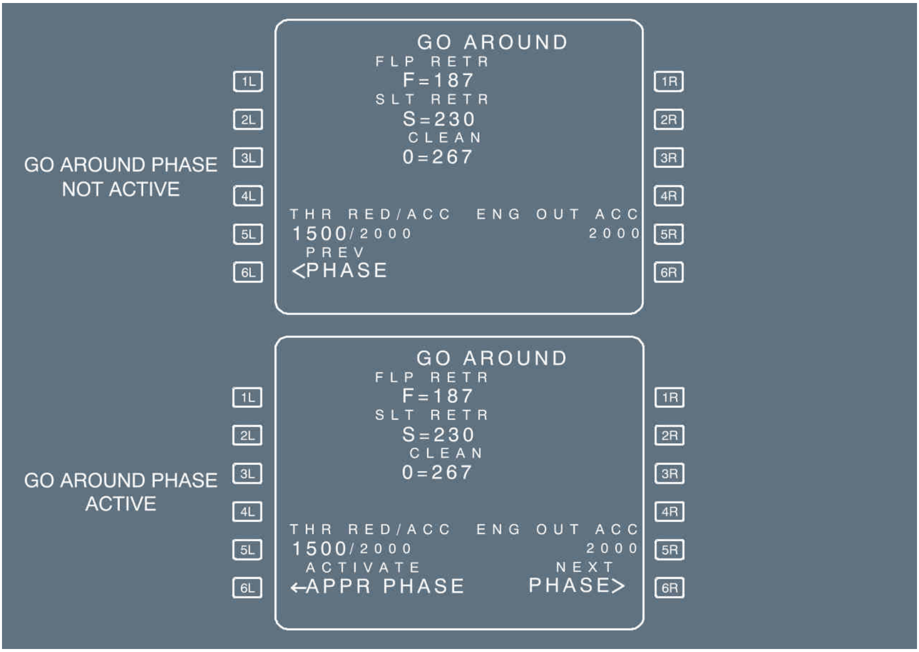
TITLE	The page title displays APPR, if the Approach phase is not active or APPR if the Approach phase is active.

[1L] QNH	This field displays brackets when the aircraft is more than 180 NM from the destination. Inside 180 NM, mandatory amber boxes appear. The flight crew must enter the QNH in hectopascals (hPa) or in inches of mercury (inHg). The value is either entered in hPa or inHg: - For hPa, enter three or four digits within the allowable range for hPa, or - For inHg, enter the two digits of the desired value or two digits followed by a decimal point and two additional digits, within the allowable range for inHg. The system interprets: - 1003 as 1 003 hPa - 29 as 29.00 inHg - 29.92 as 29.92 inHg. The flight crew can modify this entry at any time. Note: *An erroneous entry of an OAT or BARO minimum in QNH field (e.g. 22 °C or 2 200 ft) is accepted by the system. As a consequence, the CPC computes an erroneous cabin pressurization segment during descent, then may trigger a pressurization ECAM alert.*
[2L] TEMP	This field displays the temperature at destination. Until the flight crew enters the temperature, the field displays brackets. The flight crew can modify this figure. The system uses this temperature to refine its computation of the descent profile (ISA model).
[3L] MAG WIND or TRUE WIND	The flight crew enters the wind speed in knots at the destination in this field. The reference of the wind entry is magnetic or true, depending on the airport's reference. The system transmits any entry made in this field to the DESCENT WIND page (which displays wind direction as true, not magnetic, whatever the airport's reference is).
[4L] TRANS ALT	This field displays the transition altitude taken from the database (small font) or entered by the flight crew (large font). The flight crew can modify it at any time.

[5L] VAPP	The FMGEC computes this approach speed, using the formula: VAPP = VLS + 1/3 of the headwind component (1/3 of the headwind component is limited to 5 kt as a minimum and 15 kt as a maximum). The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. *Note:* *VLS = 1.23 VS1G of the selected landing configuration (FULL or 3).*
[6L] PREV PAGE	This field displays this legend if the approach phase is not active. Pressing this key calls up the PERF DES page.
[1R] FINAL	This field displays the approach specified in the flight plan. The flight crew cannot modify it through this field.
[2R] MDA or MDH	This field displays: - The MDA with associated brackets, or - The MDH with associated brackets, if the aircraft is equipped with QFE ◁ option. The flight crew inserts the value, which can be modified at any time. If the flight crew makes an entry in [3R] field or changes the approach, it clears this figure.
[3R] DH	If the flight plan includes an ILS or GLS ◁ approach, this field displays DH and empty brackets. For a CAT II or CAT III approach, the flight crew inserts the decision height. The system will accept an entry of NO. If the flight crew inserts an MDA or an MDH, this erases the decision height, and this field reverts to brackets. The DH range is from 0 to 700 ft.
[4R] LDG CONF CONF 3	The flight crew can select CONF 3 by pressing this key. This moves the * down to the [5R] field, that displays FULL.
[5R] FULL	The flight crew can use this key to select CONF FULL when necessary. CONF FULL is the default landing configuration.
[6R] NEXT PHASE	Pressing this key calls up the PERF GO AROUND page.

PERF GO AROUND PAGE

Ident.: DSC-22_20-50-10-25-00007238.0001001 / 01 OCT 12
Applicable to: ALL


GO AROUND PHASE NOT ACTIVE
GO AROUND PHASE ACTIVE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
            GO AROUND
       FLP RETR
       F=187
       SLT RETR
       S=230
        CLEAN
       O=267

THR RED/ACC      ENG OUT ACC
1500/2000               2000
 PREV
<PHASE
```

```
            GO AROUND
       FLP RETR
       F=187
       SLT RETR
       S=230
        CLEAN
       O=267

THR RED/ACC      ENG OUT ACC
1500/2000               2000
 ACTIVATE               NEXT
←APPR PHASE           PHASE>
```

TITLE	GO AROUND is in large white font, if the go-around phase is not active; it is in large green font, if it is.

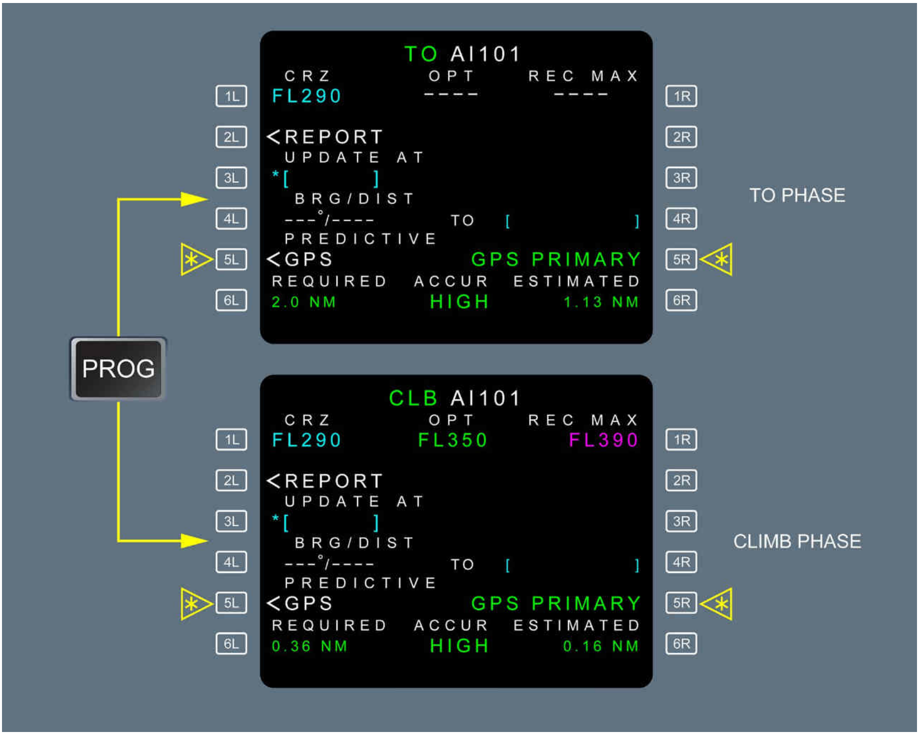
[5L] THR RED ACC	This field displays the thrust reduction altitude and the acceleration altitude. Thrust reduction altitude - Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust. - LVR CLB flashing on flight mode annunciator. - Defaults to 1 500 ft above destination runway elevation, or to the altitude set by the airline. - Can be modified by the crew (minimum 400 ft above destination runway elevation). Acceleration altitude - Altitude at which target speed jumps to green-dot speed (see the note below). - Defaults to 1 500 ft above destination runway elevation, or to the altitude set by the airline. - Can be modified by the crew but always equal to or higher than thrust reduction altitude.
[6L] PREV PHASE or	This field displays this legend, if the go-around phase is not active. Pressing the key calls up the PERF APPR page.
ACTIVATE APPR PHASE	This field displays this legend, if the go-around phase is active. Pressing it once makes “CONFIRM APPR” appear. A second press activates the approach phase.
[5R] ENG OUT ACC	This display has the same characteristics as the display beside the 5R key on the takeoff page. It is for display only, and the pilot can modify it.
[6R] NEXT PHASE	Pressing this key calls up the PERF APPR page.
[IR] Blank or EO CLR*	This field is normally blank. EO CLR* is displayed when GO AROUND is the active phase and an engine-out condition is detected.

Note: *When the go-around phase is active, if the pilot enables ALTN, or if the pilot inserts a new destination in the active flight plan and a new cruise flight level on the progress page, the go-around phase automatically shifts to the climb phase. (The target speed jumps from green dot speed to initial climb speed).*

PROG PAGES

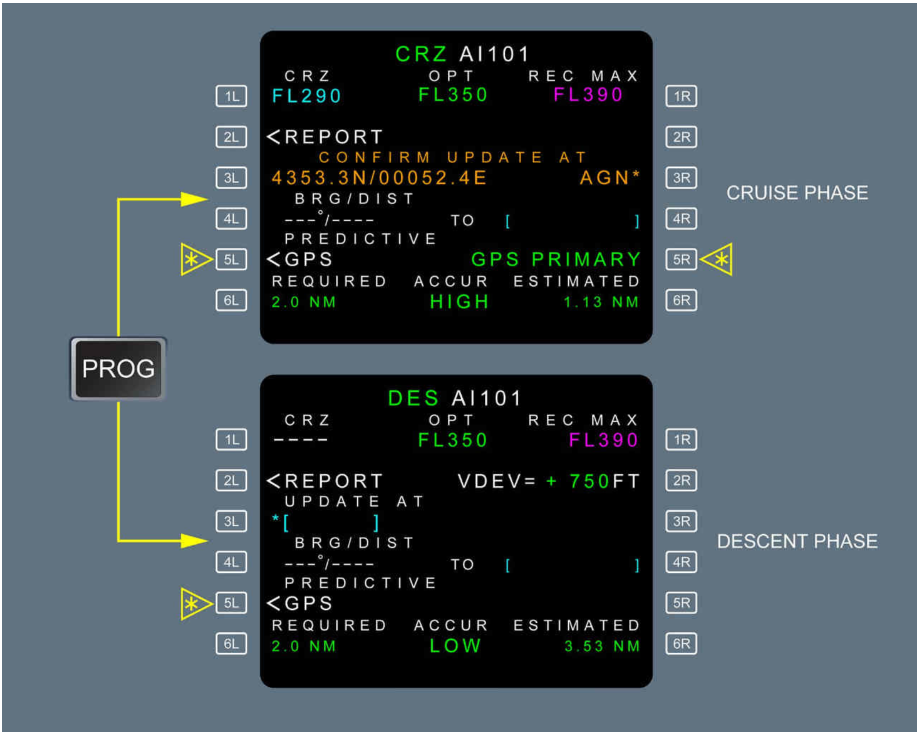
Ident.: DSC-22_20-50-10-25-00007293.0006001 / 17 NOV 20
Applicable to: LV-GKO, LV-GKP

The progress page is a multifunction page that enables the flight crew to:
- Select a new cruise flight level
- Cross-check the navigation accuracy of the Flight Management (FM) system and validate it
- Update the FM position
- Monitor the descent.



```
              TO AI101
 CRZ          OPT        REC MAX
FL290         ----        ----
<REPORT
 UPDATE AT
*[          ]
  BRG/DIST
 ---°/----        TO  [          ]
 PREDICTIVE
<GPS                  GPS PRIMARY
REQUIRED     ACCUR   ESTIMATED
2.0 NM        HIGH      1.13 NM
```

```
             CLB AI101
 CRZ          OPT        REC MAX
FL290        FL350       FL390
<REPORT
 UPDATE AT
*[          ]
  BRG/DIST
 ---°/----        TO  [          ]
 PREDICTIVE
<GPS                  GPS PRIMARY
REQUIRED     ACCUR   ESTIMATED
0.36 NM       HIGH      0.16 NM
```

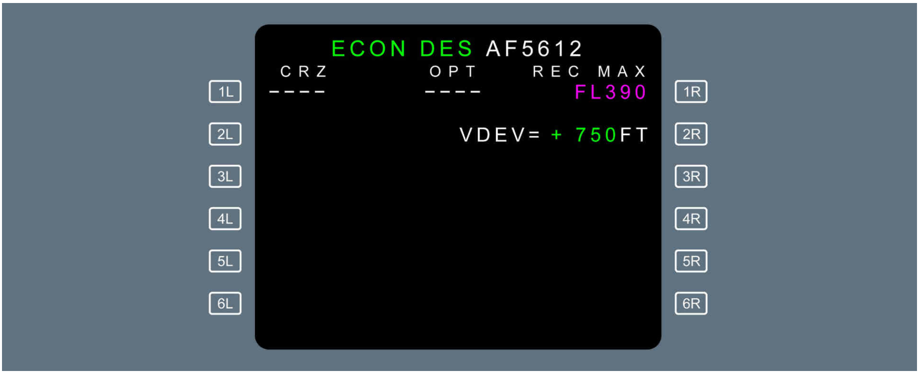


```
CRZ AI101
 CRZ          OPT       REC MAX
FL290        FL350       FL390
<REPORT
   CONFIRM UPDATE AT
4353.3N/00052.4E          AGN*
  BRG/DIST
 ---°/----      TO  [          ]
 PREDICTIVE
<GPS              GPS PRIMARY
REQUIRED     ACCUR    ESTIMATED
2.0 NM        HIGH      1.13 NM
```

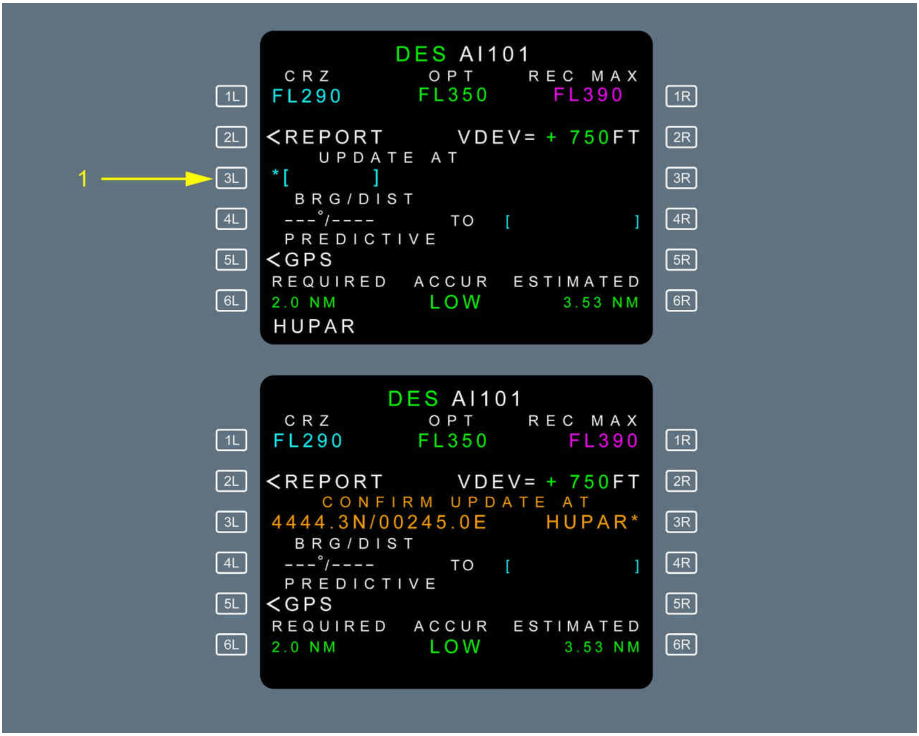
```
DES AI101
 CRZ          OPT       REC MAX
----         FL350       FL390
<REPORT          VDEV= + 750FT
 UPDATE AT
*[        ]
  BRG/DIST
 ---°/----      TO  [          ]
 PREDICTIVE
<GPS
REQUIRED     ACCUR    ESTIMATED
2.0 NM        LOW       3.53 NM
```

TITLE	The title is different for each flight phase (see illustrations above). The FMS flight phase appears in large green font. The flight number in large white font. EO in amber large font if the engine out is detected.
Line 1 CRZ (blue)	This line displays in blue the cruise flight level inserted on the INIT A page or directly in this field. If the flight crew uses the FCU to select an altitude that is higher than that displayed in this field, the system changes the number displayed in this field to agree. The flight crew cannot insert flight level in this field that is lower than the FCU selected altitude. This field displays dashes when the descent or approach phase is active.

OPT	This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index, temperature, wind and a minimum estimated cruising time of 15 min. It displays dashes: - In cruise, when the aircraft is less than 15 NM from the Top of Descent - In the descent and approach phases - If an engine-out is detected.
REC MAX	This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature and assuming that the anti-ice is off (if icing conditions are expected, use the performance application of the EFB). It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 410. If one engine is out (or two engines for A340 aircraft only), this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off. _Note:_ *The REC MAX field may display a value up to FL 415. However, the current aircraft's maximum certified altitude is 41 100 ft. Disregard the OPT MAX value, if it exceeds FL 411.*
[2L] REPORT	This key calls up the REPORT PAGE.
[2R] VDEV	This field is displayed during the descent and approach phases, when NAV mode is engaged, or in HDG mode, provided that the crosstrack error (XTK) is less than 5 NM. It displays the vertical deviation between the aircraft's current altitude and the FMS-computed vertical profile.



Line 3 UPDATE AT	The flight crew can update the FMS position via this field by entering either the IDENT of a waypoint, a NAVAID, an airport, a latitude and longitude, a place/bearing/distance, or a place-bearing/place-bearing.



```
              DES AI101
 CRZ            OPT        REC MAX
FL290          FL350        FL390
<REPORT             VDEV= + 750FT
     UPDATE AT
*[         ]
   BRG/DIST
 ---°/----         TO  [          ]
 PREDICTIVE
<GPS
REQUIRED      ACCUR     ESTIMATED
2.0 NM         LOW        3.53 NM
HUPAR
```

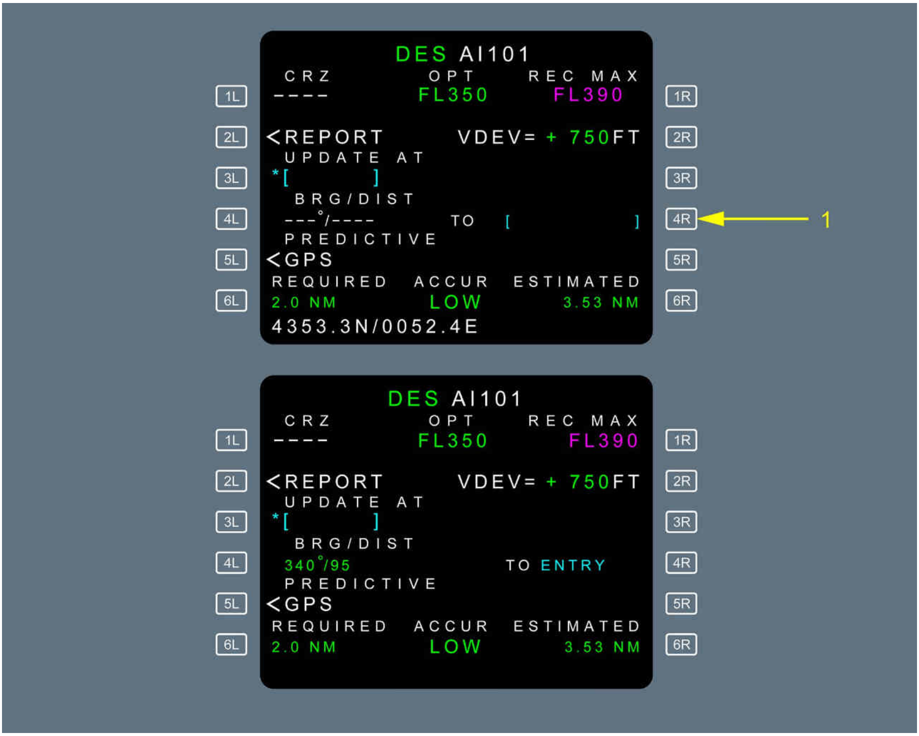
```
             DES AI101
 CRZ            OPT        REC MAX
FL290          FL350         FL390
<REPORT             VDEV= + 750FT
      CONFIRM UPDATE AT
4444.3N/00245.0E          HUPAR*
   BRG/DIST
 ---°/----         TO  [          ]
 PREDICTIVE
<GPS
REQUIRED      ACCUR     ESTIMATED
2.0 NM         LOW        3.53 NM
```

Line 3 UPDATE AT	When the flight crew has entered this data, this field changes its format to: "CONFIRM UPDATE AT", followed by the latitude/longitude and ident of the inserted position with an asterisk. *Note: If no IDENT has been inserted, the field displays "ENTRY" instead of an IDENT.* The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.

Line 4 BRG/DIST

On this line the flight crew can enter an airport, a waypoint, a NAVAID, or a runway. The flight crew may enter this information as an IDENT, a latitude/longitude, a place/bearing/distance, or a place-bearing/place-bearing (PBX). The field then displays the FMS computed bearing and distance of this bearing from the aircraft's present position. If it does not have an IDENT, the point is called "ENTRY".

Example : BRG/DIST
340 °/95.4 to ENTRY
The line displays a T if the true reference is selected (NORTH REF pushbutton switch).


DES AI101
CRZ
OPT
REC MAX

FL350
FL390
<REPORT
VDEV= + 750FT
UPDATE AT
*[ ]
BRG/DIST
---°/----
TO [ ]
PREDICTIVE
<GPS
REQUIRED
ACCUR
ESTIMATED
2.0 NM
LOW
3.53 NM
4353.3N/0052.4E
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
1
DES AI101
CRZ
OPT
REC MAX

FL350
FL390
<REPORT
VDEV= + 750FT
UPDATE AT
*[ ]
BRG/DIST
340°/95
TO ENTRY
PREDICTIVE
<GPS
REQUIRED
ACCUR
ESTIMATED
2.0 NM
LOW
3.53 NM
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

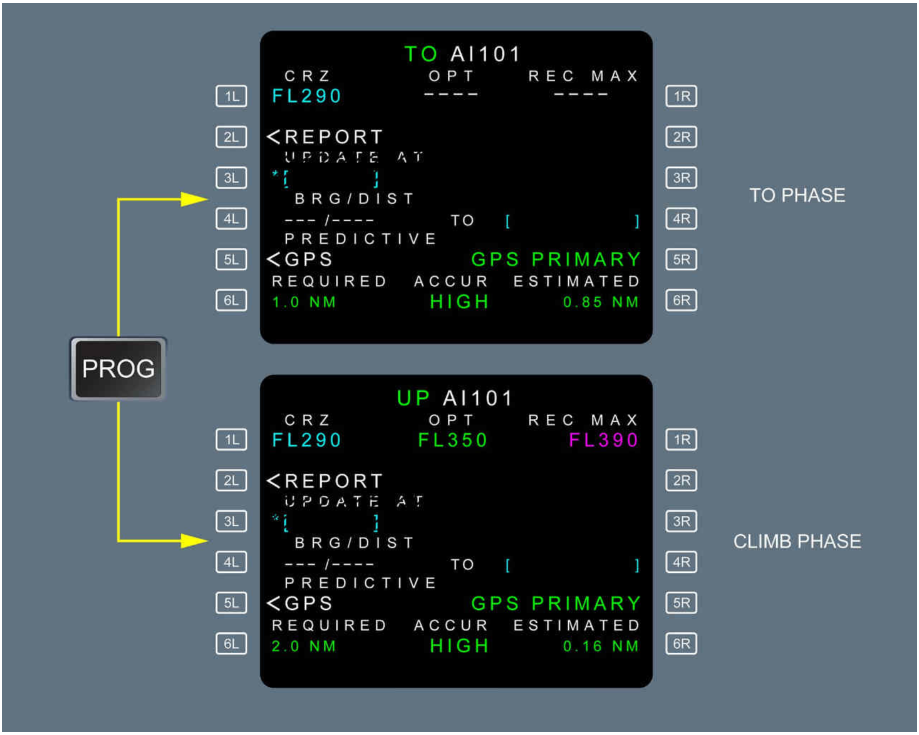
[5L] PREDICTIVE GPS This field provides access to the PREDICTIVE GPS page.

[5R] GPS PRIMARY ◁	If installed, this field displays GPS PRIMARY when the GPS PRIMARY is available. When GPS PRIMARY is not available, this field is blank. The scratchpad displays “GPS PRIMARY″ when GPS/IRS becomes available or “GPS PRIMARY LOST” when GPS/IRS is no longer available.
[6L] REQUIRED	This field displays the default value for the required navigation accuracy. The flight crew can modify it, as necessary. If the flight crew has not modified this data, the default value changes according to the current flight area (*Refer to DSC-22_20-10 General*).
ACCUR HIGH/LOW	This field displays the navigation accuracy estimated by the FMS. HIGH indicates that the estimated navigation accuracy is high: The ESTIMATED value is less than the REQUIRED value. LOW indicates that the estimated navigation accuracy is low: The ESTIMATED value is greater than the REQUIRED value.
[6R] ESTIMATED	This field displays the current Estimated Position Error value (EPE), as computed by the FMS.

PROG PAGES

Ident.: DSC-22_20-50-10-25-00007293.0025001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

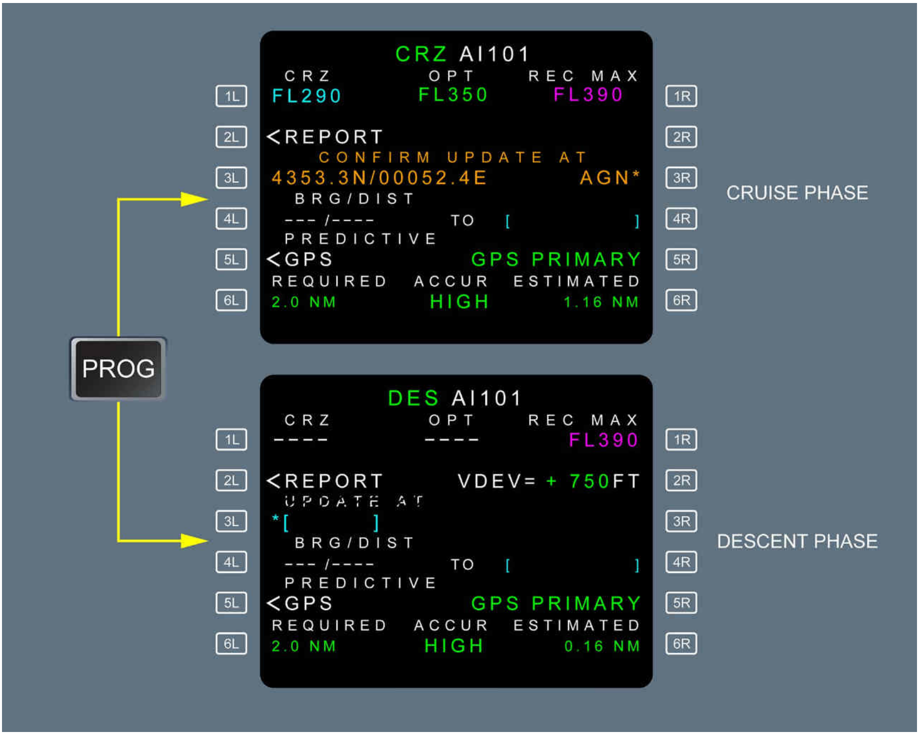
The progress page is a multifunction page that enables the pilot to:
- Select a new cruise flight level
- Crosscheck the navigation accuracy of the Flight Management (FM) system and validate it
- Update the FM position
- Monitor the descent.



```
         TO AI101
  CRZ          OPT      REC MAX
FL290          ----       ----
<REPORT
  UPDATE AT
*[        ]
   BRG/DIST
  --- /----        TO  [        ]
  PREDICTIVE
<GPS               GPS PRIMARY
REQUIRED     ACCUR    ESTIMATED
1.0 NM       HIGH       0.85 NM
```

```
         UP AI101
  CRZ          OPT      REC MAX
FL290         FL350      FL390
<REPORT
  UPDATE AT
*[        ]
   BRG/DIST
  --- /----        TO  [        ]
  PREDICTIVE
<GPS               GPS PRIMARY
REQUIRED     ACCUR    ESTIMATED
2.0 NM       HIGH       0.16 NM
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
TO PHASE
PROG
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CLIMB PHASE

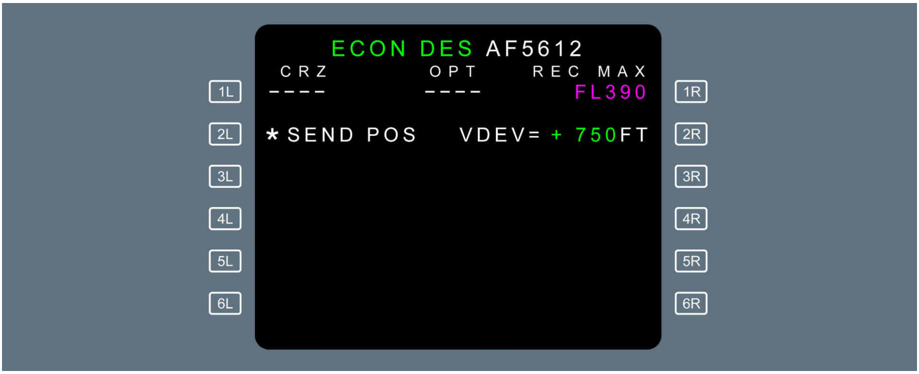


```
           CRZ AI101
 CRZ          OPT       REC MAX
FL290        FL350       FL390
<REPORT
     CONFIRM UPDATE AT
4353.3N/00052.4E          AGN*
  BRG/DIST
 --- /----        TO  [        ]
 PREDICTIVE
<GPS               GPS PRIMARY
REQUIRED    ACCUR   ESTIMATED
2.0 NM       HIGH       1.16 NM
```

```
           DES AI101
 CRZ          OPT       REC MAX
----         ----        FL390
<REPORT         VDEV= + 750FT
 UPDATE AT
*[         ]
  BRG/DIST
 --- /----        TO  [        ]
 PREDICTIVE
<GPS               GPS PRIMARY
REQUIRED    ACCUR   ESTIMATED
2.0 NM      HIGH        0.16 NM
```

TITLE	Different for each flight phase (see above). The vertical phase is in large green font. The flight number is in large white font. EO is large amber font, if the engine-out condition is detected.
Line 1 CRZ (blue)	This line displays the cruise flight level, inserted on the INIT A page or directly in this field in blue. If the FCU is used to select an altitude that is higher than the one displayed, the system changes the displayed number to match the one selected by the FCU. In this line, the flight crew cannot insert a flight level that is lower than the FCU-selected altitude. This field shows dashes when the descent or approach phase is active.

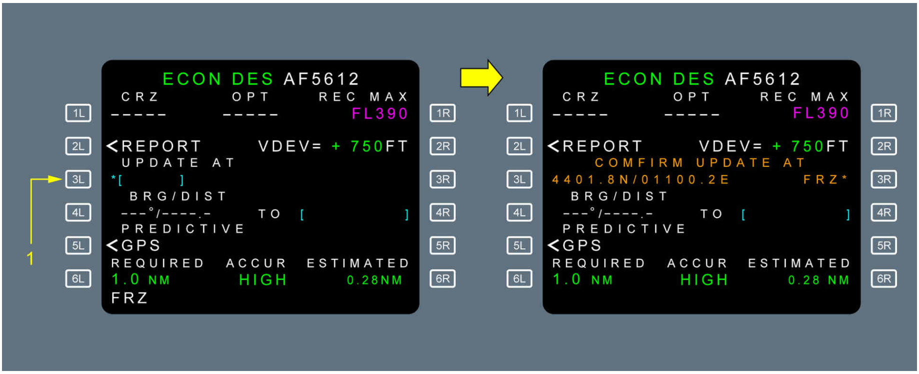
OPT	This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index, temperature and wind. This flight level requires a 5 min minimum cruise time at a minimum cruise flight level of FL 100. It displays dashes if an engine-out is detected.
REC MAX	This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature, and assuming that the anti-ice is off (if icing conditions are expected, use the performance application of the EFB). It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 415. If one engine is out (or two engines for A340 aircraft only), this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off.
[2L] REPORT	This key calls up the REPORT PAGE.
[2R] VDEV	This field is displayed during the descent and approach phases, when NAV mode is engaged, or in HDG mode, provided that the crosstrack error (XTK) is less than 5 NM. It displays the vertical deviation between the aircraft's current altitude and the FMS-computed vertical profile.



```
    ECON DES AF5612
CRZ          OPT       REC MAX
----         ----        FL390
*SEND POS      VDEV= + 750FT
```

Line 3 UPDATE AT	The flight crew can update the FMS position through this field by entering either the identification for a waypoint, a NAVAID, an airport, a latitude and longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PBX). When the flight crew has entered this data, this field changes its format to: "CONFIRM UPDATE AT", followed by the latitude/longitude and IDENT of the inserted position with an asterisk. The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.

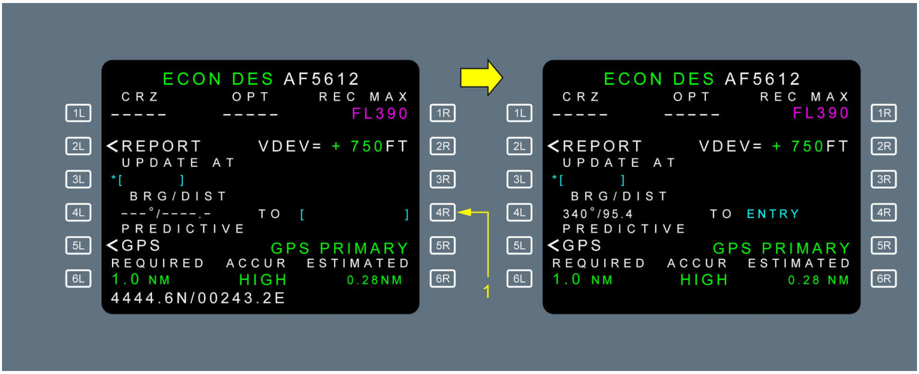
Note: *If no IDENT has been inserted, the field displays "ENTRY", instead of an IDENT.*



```
ECON DES AF5612
 CRZ        OPT      REC MAX
-----      -----       FL390
<REPORT       VDEV= + 750FT
 UPDATE AT
*[      ]
  BRG/DIST
 ---°/----.-  TO [          ]
 PREDICTIVE
<GPS
REQUIRED   ACCUR   ESTIMATED
1.0 NM      HIGH     0.28NM
FRZ
```

```
ECON DES AF5612
 CRZ        OPT      REC MAX
-----      -----       FL390
<REPORT       VDEV= + 750FT
    COMFIRM UPDATE AT
4401.8N/01100.2E        FRZ*
  BRG/DIST
 ---°/----.-  TO [          ]
 PREDICTIVE
<GPS
REQUIRED   ACCUR   ESTIMATED
1.0 NM      HIGH    0.28 NM
```

Line 4 BRG/DIST	On this line, the pilot can enter an airport, a waypoint, a NAVAID, or a runway. The pilot may enter each as an IDENT, a latitude/longitude, a place/bearing/distance, or a place-bearing/place-bearing. The field then shows the FMGEC-computed bearing and distance from this site to the aircraft's present position. The last distance digit is in 1/10 of a NM. If it does not have an IDENT, the point is called "ENTRY". Example: BRG/DIST 340 °/ 95.4 to ENTRY


ECON DES AF5612
CRZ OPT REC MAX
----- ----- FL390
<REPORT VDEV= + 750FT
UPDATE AT
*[ ]
BRG/DIST
---°/----.- TO [ ]
PREDICTIVE
<GPS GPS PRIMARY
REQUIRED ACCUR ESTIMATED
1.0 NM HIGH 0.28NM
4444.6N/00243.2E
1
ECON DES AF5612
CRZ OPT REC MAX
----- ----- FL390
<REPORT VDEV= + 750FT
UPDATE AT
*[ ]
BRG/DIST
340°/95.4 TO ENTRY
PREDICTIVE
<GPS GPS PRIMARY
REQUIRED ACCUR ESTIMATED
1.0 NM HIGH 0.28 NM
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

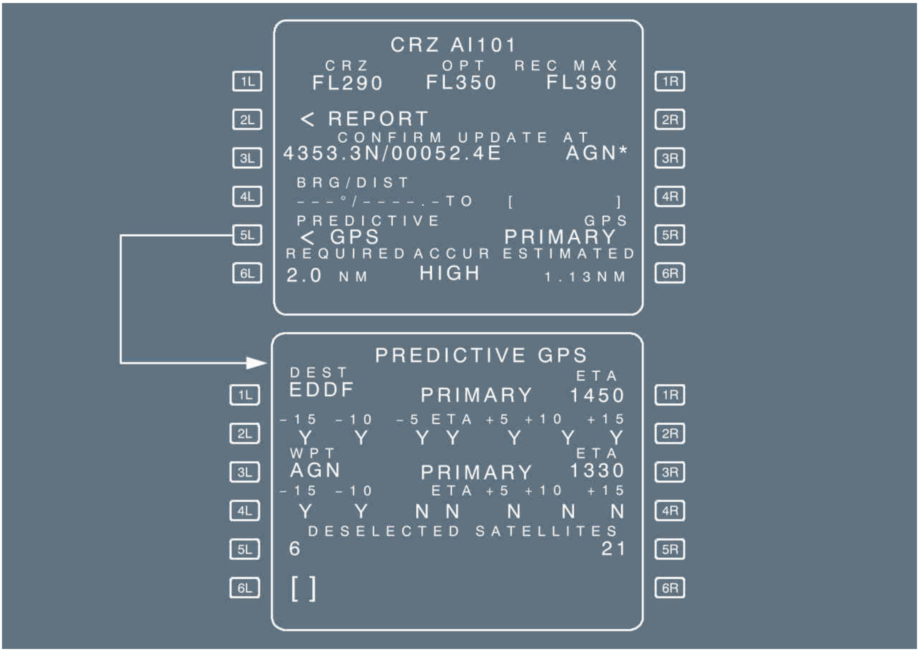
[5L] PREDICTIVE GPS ◁	This prompt gives access to the PREDICTIVE GPS page.
[5R] GPS PRIMARY ◁	This prompt is displayed when the FMS navigation mode is GPS PRIMARY. This field is blank, when GPS PRIMARY is unavailable, or the navigation mode is not GPS/IRS. The scratchpad displays the relevant “GPS PRIMARY″ message when this prompt appears, and “GPS PRIMARY LOST” when the field goes blank.
[6L] REQUIRED	This field displays the default value for the required navigation accuracy level. The pilot can modify it. Provided no pilot entry has been made, the default value changes according to the actual flight area (enroute, terminal, approach; *Refer to DSC-22_20-40-10 General*).
ACCUR HIGH/LOW	This field shows the flight management system’s estimate of navigational accuracy. “HIGH” indicates that the FMS estimates that the navigational accuracy matches the accuracy criteria of the currently flown area. “LOW” indicates the criteria is not matched.
[6R] ESTIMATED	This field displays the current estimated navigation accuracy value (EPE), as computed by the FMS.

PREDICTIVE GPS PAGE

Ident.: DSC-22_20-50-10-25-00007316.0001001 / 11 JUL 17
Applicable to: ALL

Note: *1. This page is only operative with Honeywell ADIRS.*
2. This page cannot be used as a substitute to determine pre-flight planning RAIM availability when required by operational regulations. Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed).

The pilot accesses this page by pressing the PREDICTIVE GPS prompt of the PROG page.
This page displays information relative to predictive availability of GPS PRIMARY at destination and at any waypoint selected by the crew.



```
CRZ AI101
   CRZ          OPT     REC MAX
FL290        FL350       FL390
< REPORT
     CONFIRM UPDATE AT
4353.3N/00052.4E          AGN*
 BRG/DIST
 ---°/----.-TO    [            ]
 PREDICTIVE                 GPS
< GPS                   PRIMARY
REQUIRED ACCUR  ESTIMATED
2.0 NM        HIGH       1.13NM
```

```
        PREDICTIVE GPS
DEST
EDDF                          ETA
              PRIMARY        1450
-15  -10   -5 ETA +5  +10     +15
 Y    Y     Y Y    Y   Y       Y
WPT                           ETA
AGN           PRIMARY        1330
-15  -10      ETA +5  +10     +15
 Y    Y     N N    N   N       N
  DESELECTED  SATELLITES
6                              21
[ ]
```

[1L] DEST	Destination airport as currently selected in active flight plan. Not modifiable. This field shows dashes when no destination airport exists.
[1R] ETA	This field is defaulted to the estimated arrival time as computed by the FMS (blue small font). The pilot may enter a value in this field (blue large font). Amber boxes are displayed when no prediction exist or crew entry has been cleared.
Line 2 PRIMARY Y/N	Predicted primary status at destination airport at the following times: estimated time of arrival ± 5, 10, 15 min. Availability of GPS PRIMARY at corresponding time is indicated by Y when PRIMARY is predicted to be available and by N when GPS PRIMARY is predicted to be unavailable. These fields are blanked when destination [1L] or time [1R] is not defined.
[3L] WPT	The pilot may enter a reference waypoint in this field. Blue brackets are displayed when no entry has been made.

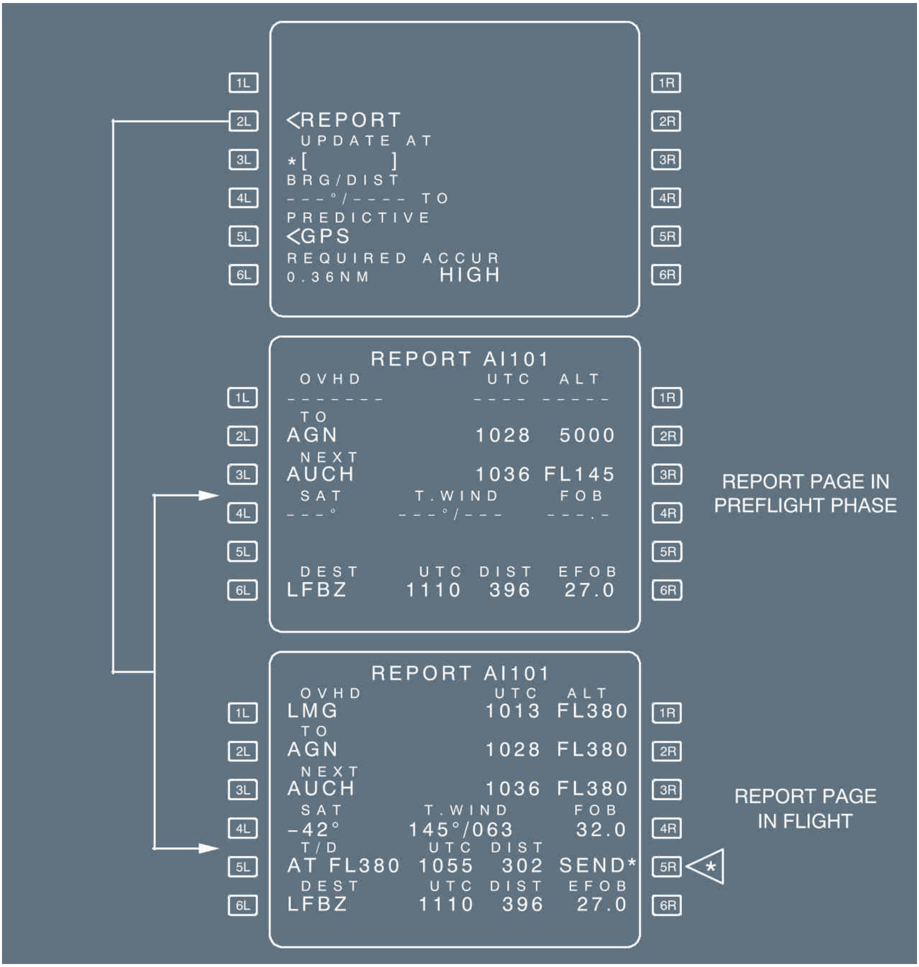
[3R] ETA	When a reference waypoint has been entered in [3L], amber boxes are displayed. The crew is requested to enter a reference time in this field.
Line 4 PRIMARY Y/N	Equivalent information to [2L] / [2R] displayed for any pilot selected waypoint. Corresponding time of arrival is also displayed.
Line 5 DESELECTED SATELLITES and Line 6 SATELLITES	Allow the pilot to deselect up to four satellites by inserting the corresponding satellite number, the number is then displayed in blue large font. When deactivated, the satellites are not considered for predictive GPS availability at destination or at selected waypoint. The deselection is cancelled when the entry is cleared (blue brackets are displayed) or the field is overwritten by a different satellite number.

REPORT PAGE

Ident.: DSC-22_20-50-10-25-00007313.0001001 / 01 OCT 12

Applicable to: LV-GKO, LV-GKP

The pilot calls this page by pressing the [2L] key on the PROG page :



```
<REPORT
 UPDATE AT
*[          ]
BRG/DIST
---°/---- TO
PREDICTIVE
<GPS
REQUIRED ACCUR
0.36NM      HIGH
```

```
      REPORT AI101
 OVHD           UTC   ALT
-------         ----  -----
 TO
AGN             1028  5000
 NEXT
AUCH            1036 FL145
 SAT      T.WIND      FOB
---°     ---°/---    ---.-

 DEST    UTC  DIST  EFOB
LFBZ    1110   396  27.0
```

```
      REPORT AI101
 OVHD            UTC   ALT
LMG             1013 FL380
 TO
AGN             1028 FL380
 NEXT
AUCH            1036 FL380
 SAT      T.WIND       FOB
-42°     145°/063     32.0
 T/D       UTC  DIST
AT FL380  1055   302 SEND*
 DEST      UTC  DIST  EFOB
LFBZ      1110   396  27.0
```

This page displays information relative to the FROM, TO, NEXT and DEST waypoints as well as the current wind, temperature, distance and time to the next cruise profile change.

TITLE (White)	Displays the flight number. This line displays EO amber in case of engine out detection.
[1L] OVHD (green)	Displays the last sequenced waypoint. This field never displays the pseudo waypoints and F-PLN markers (T-P, PPOS, IN-BND, OUT-BND).

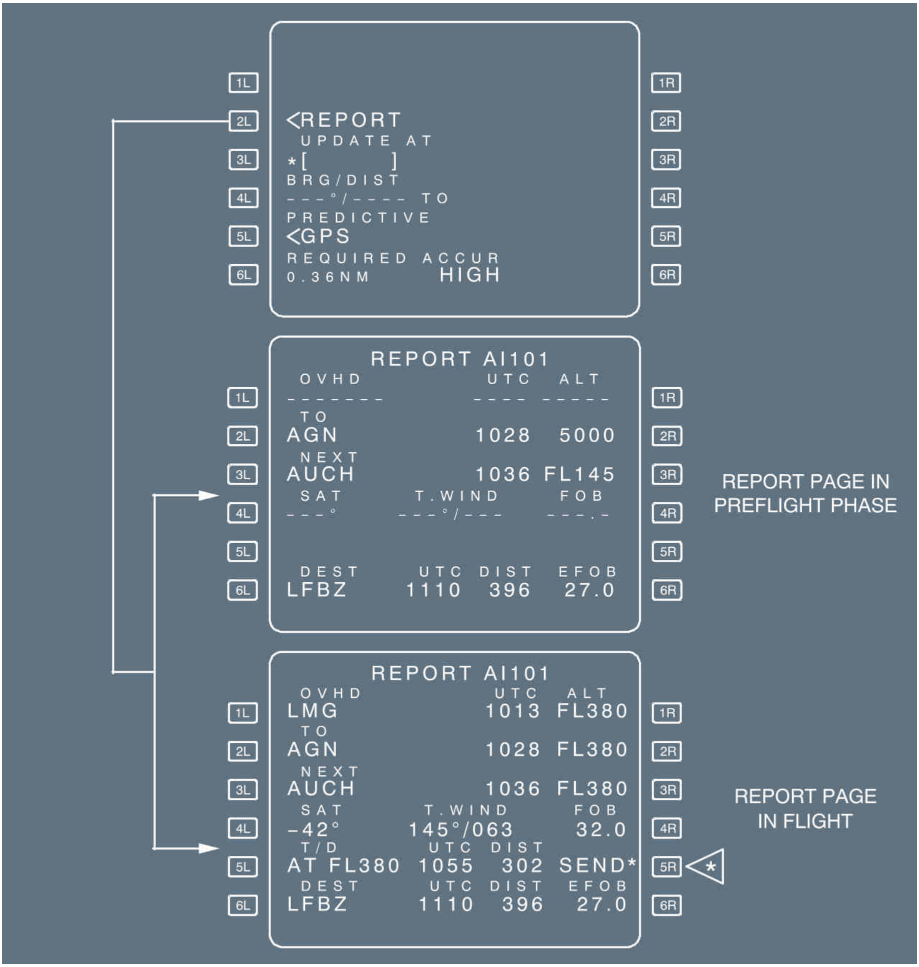
[1R] UTC/TIME ALT (green)	This field displays the time and altitude recorded at the time of sequence.
[2L]-[2R] TO (green)	This field displays the active waypoint, predicted time of arrival and predicted altitude at this waypoint. *Note:* *Time and altitude values are identical to those values on F-PLN pages.*
[3L]-[3R] NEXT (green)	Same information for the next waypoint.
[4L] [4R] SAT/T.WIND/FOB (green)	This field displays the static air temperature, the wind direction and velocity, and the FOB recorded at waypoint sequencing.
[5L] T/D/UTC/DIST (green)	This field displays the estimated time and the distance to go to the next change of the cruise profile (T/D, S/C, S/D). These data are only displayed when the cruise phase is active.
[5R] SEND* ◁ (blue)	The crew uses this prompt to downlink a position report. This field may be blanked depending on airline policy, and on ACARS installation.
Line 6 DEST/UTC/DIST/EFOB	This field displays the estimated time of arrival, the distance along the F-PLN and estimated fuel on board at destination. This display is identical to the information of the F-PLN pages.

Note: *No data can be inserted or modified on the REPORT page.*

REPORT PAGE

Ident.: DSC-22_20-50-10-25-00007313.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The pilot calls this page by pressing the [2L] key on the PROG page :


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
<REPORT
UPDATE AT
*[ ]
BRG/DIST
---°/---- TO
PREDICTIVE
<GPS
REQUIRED ACCUR
0.36NM HIGH
REPORT AI101
OVHD UTC ALT
------- ---- -----
TO
AGN 1028 5000
NEXT
AUCH 1036 FL145
SAT T.WIND FOB
---° ---°/--- ---.-
DEST UTC DIST EFOB
LFBZ 1110 396 27.0
REPORT PAGE IN PREFLIGHT PHASE
REPORT AI101
OVHD UTC ALT
LMG 1013 FL380
TO
AGN 1028 FL380
NEXT
AUCH 1036 FL380
SAT T.WIND FOB
-42° 145°/063 32.0
T/D UTC DIST
AT FL380 1055 302 SEND*
DEST UTC DIST EFOB
LFBZ 1110 396 27.0
<*
REPORT PAGE IN FLIGHT

This page displays information relative to the FROM, TO, NEXT and DEST waypoints as well as the current wind, temperature, distance and time to the next cruise profile change.

TITLE (White)	Displays the flight number. This line displays EO amber in case of engine out detection.
[1L] OVHD (green)	Displays the last sequenced waypoint. This field never displays the pseudo waypoints and F-PLN markers (T-P, PPOS, IN-BND, OUT-BND).

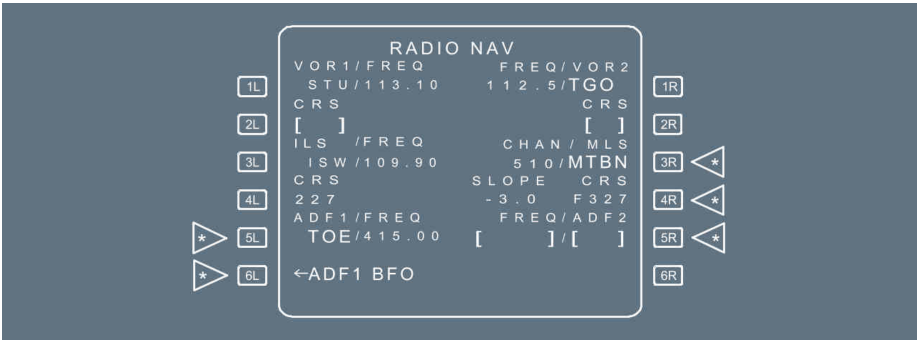
[1R] UTC/TIME ALT (green)	This field displays the time and altitude recorded at the time of sequence.
[2L]-[2R] TO (green)	This field displays the active waypoint, predicted time of arrival and predicted altitude at this waypoint. *Note:* *Time and altitude values are identical to those values on F-PLN pages.*
[3L]-[3R] NEXT (green)	Same information for the next waypoint.
[4L] [4R] SAT/T.WIND/FOB (green)	This field displays the static air temperature, the wind direction and velocity, and the FOB recorded at waypoint sequencing.
[5L] T/D/UTC/DIST (green)	This field displays the estimated time and the distance to go to the next change of the cruise profile (T/D, S/C, S/D). These data are only displayed when the cruise phase is active.
[5R] SEND* ◁✳ (blue)	The crew uses this prompt to downlink a position report. This field may be blanked depending on airline policy, and on ACARS installation.
Line 6 DEST/UTC/DIST/EFOB	This field displays the estimated time of arrival, the distance along the F-PLN and estimated fuel on board (DEST EFOB) at destination. The DEST EFOB field will turn to amber, if the EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page. This display is identical to the information of the F-PLN pages.

Note: *No data can be inserted or modified on the REPORT page.*

RADIO NAV PAGE

Ident.: DSC-22_20-50-10-25-00014467.0001001 / 01 OCT 12
Applicable to: LV-GKO, LV-GKP

This page enables the pilot to select or verify the radio NAVAIDs tuned for display purposes only.
Among these NAVAIDs are VOR, VOR/DME, TAC, VORTAC, and ILS.
If either RMP is set to NAV, this page is blank on both MCDUs.



```
                RADIO NAV
 VOR1/FREQ                FREQ/VOR2
  STU/113.10            112.5/TGO
 CRS                            CRS
 [   ]                        [   ]
 ILS   /FREQ             CHAN/ MLS
  ISW/109.90              510/MTBN
 CRS                    SLOPE   CRS
 227                     -3.0  F327
 ADF1/FREQ                FREQ/ADF2
  TOE/415.00            [      ]/[   ]
 ←ADF1 BFO
```

Line 1 VOR 1/FREQ FREQ/VOR 2	This line displays the identifiers and frequencies of VOR 1 and VOR 2, whether they are automatically or manually-tuned. To manually tune a VOR, the pilot inserts the IDENT or frequency. If the IDENT is not in the database, the new NAVAID page comes up. A “clear” action reverts the selection to the autotuned NAVAID.
Line 2 CRS	This line displays courses for the NAVAIDs on Line 1. The pilot can manually enter the courses via these fields. It displays “T”, if a tuned VOR is true North-referenced.
[3L] ILS/FREQ	This field displays the ILS IDENT and frequency. It is autotuned, if the ILS is associated with the departure runway, or if the flight plan shows an ILS approach selected for the destination. The ILS may also be entered manually. When the manually-entered ILS differs from the autotuned ILS, “RWY–ILS MISMATCH” appears.
[4L] CRS	This field displays the course associated with the ILS on Line 3. It comes up automatically when an ILS is autotuned, or if an ILS has been manually-tuned via its IDENT. Otherwise, the course must be entered manually. The course may be backbeam (Bxxx), or frontbeam (Fxxx). Note: *If the flight crew intends to manually tune an ILS that is not in the Navigation Database or to manually tune an ILS by its frequency (ident not entered), and if they do not enter the course, the flight crew will not be able to arm approach modes.*
[3R] CHAN/MLS ◁	The pilot manually tunes an MLS by its IDENT, or its channel. The system automatically tunes the associated course and slope. Note: *If an MLS is tuned while an ILS was tuned, the ILS is deselected.*

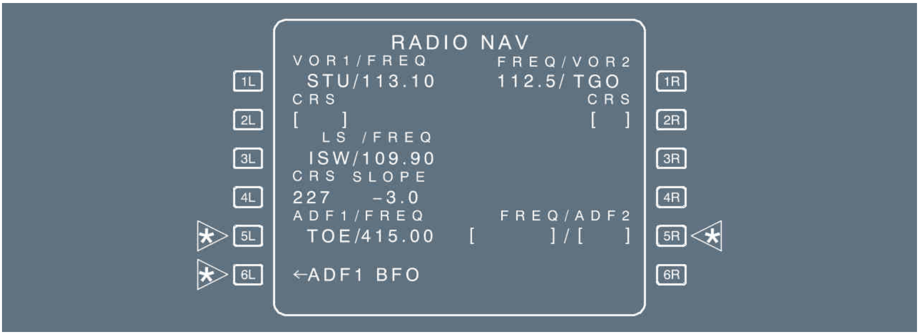
[4R] SLOPE CRS ◁	The pilots enters the slope and the course of the MLS in this field. The course may be backbeam (Bxxx), or frontbeam (Fxxx). The field displays “T”, if the MLS is true North-referenced.
Line 5 ADF 1/FREQ FREQ/ADF 2 ◁	This line displays the identifiers and frequencies of ADFs 1 and 2. The pilot can use the IDENT or the frequency to manually tune the ADF.
[6L] Line 6 ADF 1/BFO BFO/ADF 2 ◁	When an ADF 1 is selected, these fields displays an ADF/BFO prompt. The flight crew presses the key once to erase the arrow and put the ADF in BFO mode. A clear action brings the arrow back and cancels BFO.

<u>Note:</u>
- *The autotune function only works for NAVAIDs stored in the database*
- *When tuning manually, the operator should use the IDENT rather than the frequency, unless the NAVAID is not in the database*
- *Manually tuned frequencies are displayed in large font.*

RADIO NAV PAGE

Ident.: DSC-22_20-50-10-25-00014467.0002001 / 11 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

This page enables the pilot to select or verify the radio NAVAIDs tuned for display purposes only. Among these NAVAIDs are VOR, VOR/DME, TAC, VORTAC, and ILS, GLS ◁ and ADF ◁ . If either RMP is set to NAV, this page is blank on both MCDUs.



```
              RADIO NAV
VOR1/FREQ                FREQ/VOR2
 STU/113.10              112.5/ TGO
CRS                            CRS
[   ]                        [   ]
   LS  /FREQ
 ISW/109.90
CRS  SLOPE
227     -3.0
ADF1/FREQ                FREQ/ADF2
 TOE/415.00   [          ]/[     ]
←ADF1 BFO
```

Line 1 VOR 1/FREQ FREQ/VOR 2	This line displays the identifiers and frequencies of VOR 1 and VOR 2, whether they are automatically or manually-tuned. To manually tune a VOR, the pilot inserts the IDENT or frequency. If the IDENT is not in the database, the new NAVAID page comes up. A “clear” action reverts the selection to the autotuned NAVAID.

Line 2 CRS	This line displays courses for the NAVAIDs on Line 1. The pilot can manually enter the courses via these fields. It displays "T", if a tuned VOR is true North-referenced.
[3L] LS/FREQ	This field displays the LS IDENT and frequency. It is autotuned, if the LS is associated with the departure runway, or if the flight plan contains an LS approach. The flight crew may also manually enter an LS. When a manually-entered LS differs from the autotuned LS, "RWY–LS MISMATCH" appears.
[3R] G/S SELECTED / G/S DESELECTED :	On aircraft equipped with the FLS function, this field displays the status of the G/S selection/deselection of the tuned ILS approach. The [3R] prompt enables the flight crew to deselect the G/S of the tuned ILS approach in order to perform an ILS G/S out approach using the F-G/S and LOC guidance modes: - When the status is G/S SELECTED, the flight crew can deselect the G/S by pressing the DESELECT* prompt - When the status is G/S DESELECTED, the flight crew can re-select the G/S by pressing the SELECT* prompt.
[4L] CRS SLOPE	CRS: This field displays the course associated with the LS displayed in Line 3. It comes up automatically if an LS is autotuned, or if an LS has been manually tuned via its IDENT. Otherwise, the course must be entered manually. The course may be backbeam (Bxxx), or frontbeam (Fxxx). SLOPE: This field displays the slope associated with the LS displayed in Line 3. It comes up automatically if an LS is autotuned for approach, or if an LS has been manually tuned via its IDENT. *Note:* - *The slope does not apply to LOC only, LDA, SDF or Backbeam approaches.* - *The slope field only appears if the GLS and/or MLS function is installed.*
Line 5 ADF 1/FREQ FREQ/ADF 2 ◁	This line displays the identifiers and frequencies of ADFs 1 and 2. The pilot can use the IDENT or the frequency to manually tune the ADF.
[6L] Line 6 ADF 1/BFO BFO/ADF 2 ◁	When an ADF 1 is selected, these fields displays an ADF/BFO prompt. The flight crew presses the key once to erase the arrow and put the ADF in BFO mode. A clear action brings the arrow back and cancels BFO.

Note:
- *The autotune function only works for NAVAIDs stored in the database*
- *When tuning manually, the operator should use the IDENT rather than the frequency, unless the NAVAID is not in the database*
- *Manually tuned frequencies are displayed in large font.*

SECONDARY PAGES

Ident.: DSC-22_20-50-10-25-M-00007338.0001001 / 17 MAR 11
Applicable to: ALL

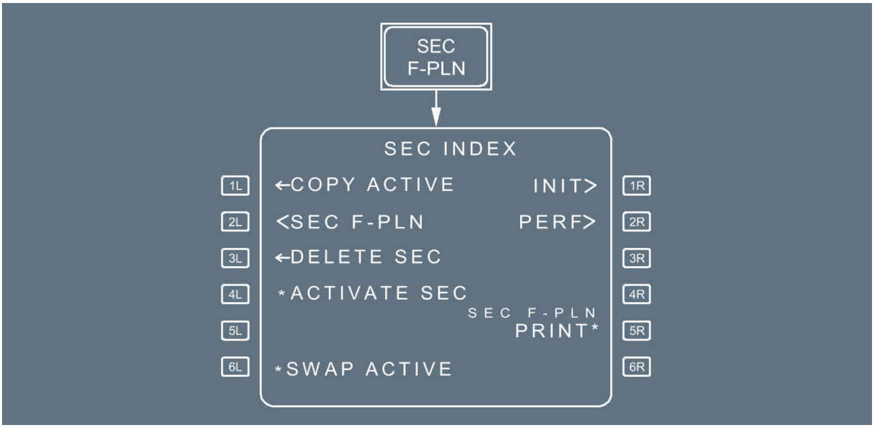
GENERAL

The SEC F-PLN key on the MCDU console allows the flight crew to call up the secondary index page and the secondary flight plan page. The secondary flight plan is generally for a diversion, for predictable runway changes for takeoff or landing, or for training.
There are two types of secondary index pages. The type selected depends on the presence of a secondary flight plan.

Ident.: DSC-22_20-50-10-25-M-00007347.0004001 / 09 DEC 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED



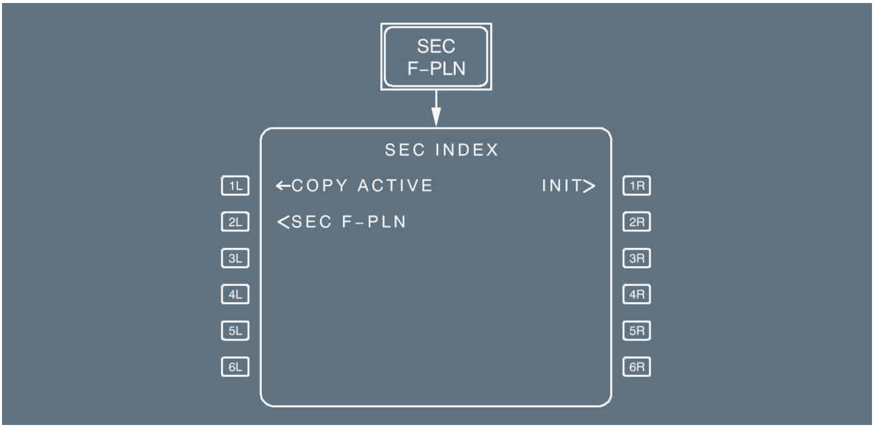
[1L] COPY ACTIVE (blue)	The flight crew presses this key to copy the active flight plan into the secondary flight plan and delete the previous secondary plan.
[2L] SEC F-PLN (white)	The flight crew presses this key to call up the secondary flight plan pages.

[3L] DELETE SEC (blue)	The flight crew presses this key to delete the current secondary flight plan.
[4L] ACTIVATE SEC (amber)	The flight crew presses this key to activate the secondary flight plan as the active flight plan.

Note: *"ACTIVATE SEC" appears routinely if the HDG/TRK mode is active. If the NAV mode is active, "ACTIVATE SEC" appears only if the active and secondary flight plans have a common active leg.*

[6L] SWAP ACTIVE (amber)	The flight crew presses this key to swap the active flight plan and the secondary flight plan: - the active flight plan becomes the secondary flight plan, and - the secondary flight plan becomes the active flight plan. When NAV mode is engaged, the function is only available if the current leg of the active flight plan is identical to its associated leg in the secondary flight plan.
[1R] INIT (white)	The flight crew presses this key to call up the SEC INIT A page.
[2R] PERF (white)	The flight crew presses this key to call up the performance pages for the secondary flight plan.
[5R] SEC F-PLN PRINT	The flight crew presses this key to print the secondary flight plan report.

A SECONDARY FLIGHT PLAN IS NOT DEFINED

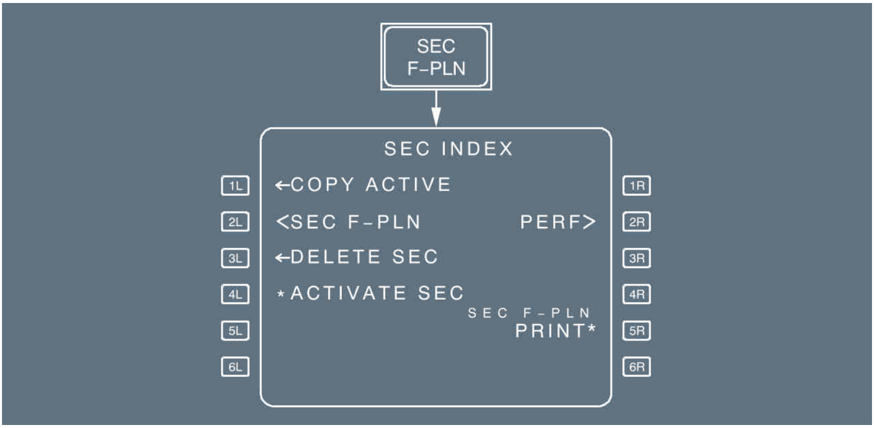


[1L] COPY ACTIVE (blue)	The flight crew presses this key to copy the active flight plan into the secondary flight plan.
[2L] SEC F-PLN (white)	The flight crew presses this key to call up the secondary flight plan pages.
[1R] INIT (white)	The flight crew presses this key to call up the secondary INIT page. It is similar to the active INIT page, but blue brackets replace all the amber boxes.

Ident.: DSC-22_20-50-10-25-M-00007347.0001001 / 01 OCT 12
Applicable to: LV-GKO, LV-GKP

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED

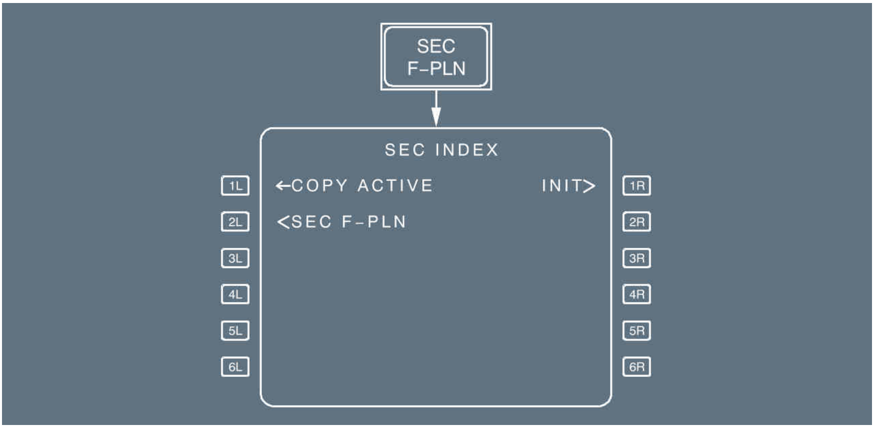


[1L] COPY ACTIVE (blue)	The flight crew presses this key to copy the active flight plan into the secondary flight plan and delete the previous secondary plan.
[2L] SEC F-PLN (white)	The flight crew presses this key to call up the secondary flight plan pages.
[3L] DELETE SEC (blue)	The flight crew presses this key to delete the current secondary flight plan.
[4L] ACTIVATE SEC (amber)	The flight crew presses this key to activate the secondary flight plan as the active flight plan.

Note: *"ACTIVATE SEC" appears routinely if the HDG/TRK mode is active. If the NAV mode is active, "ACTIVATE SEC" appears only if the active and secondary flight plans have a common active leg.*

[1R] INIT (white)	This field displays this prompt when the secondary flight plan is not defined as a copy of the active flight plan. Pressing this key calls up the SEC INIT A and B pages.
[2R] PERF (white)	The flight crew presses this key to call up the performance pages for the secondary flight plan.
[5R] SEC F-PLN PRINT	The flight crew presses this key to print the secondary flight plan report.

A SECONDARY FLIGHT PLAN IS NOT DEFINED

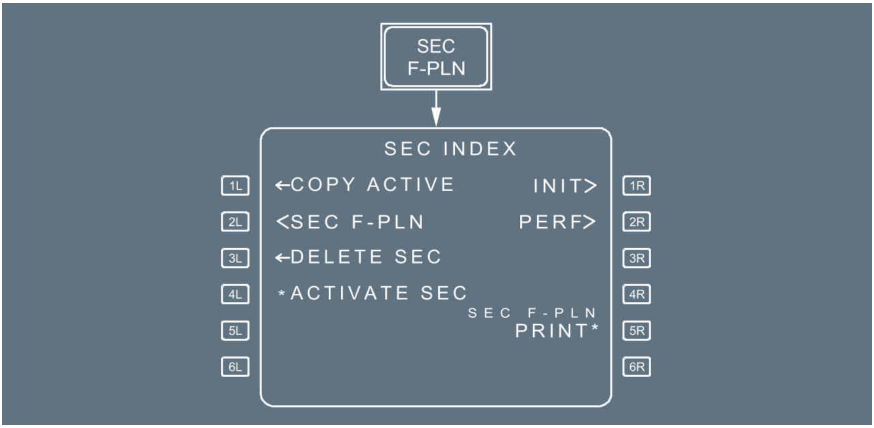


[1L] COPY ACTIVE (blue)	The flight crew presses this key to copy the active flight plan into the secondary flight plan.
[2L] SEC F-PLN (white)	The flight crew presses this key to call up the secondary flight plan pages.
[1R] INIT (white)	The flight crew presses this key to call up the secondary INIT page. It is similar to the active INIT page, but blue brackets replace all the amber boxes.

Ident.: DSC-22_20-50-10-25-M-00007347.0003001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED

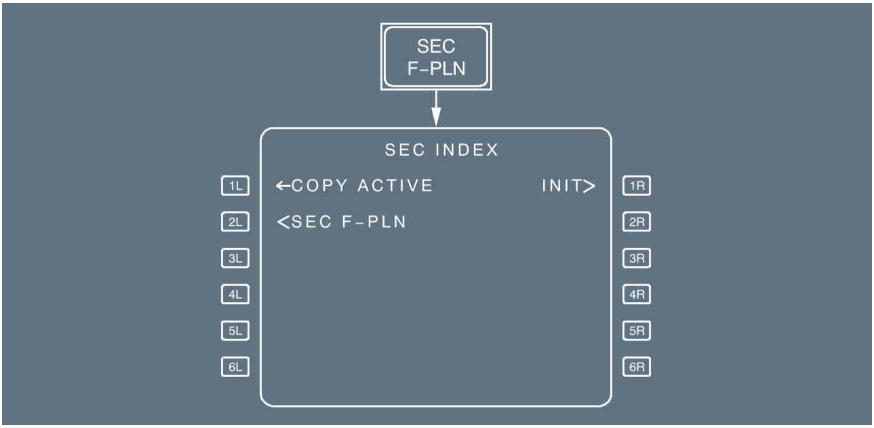


[1L] COPY ACTIVE (blue)	The flight crew presses this key to copy the active flight plan into the secondary flight plan and delete the previous secondary plan.
[2L] SEC F-PLN (white)	The flight crew presses this key to call up the secondary flight plan pages.
[3L] DELETE SEC (blue)	The flight crew presses this key to delete the current secondary flight plan.
[4L] ACTIVATE SEC (amber)	The flight crew presses this key to activate the secondary flight plan as the active flight plan.

Note: *"ACTIVATE SEC" appears routinely if the HDG/TRK mode is active. If the NAV mode is active, "ACTIVATE SEC" appears only if the active and secondary flight plans have a common active leg.*

[1R] INIT (white)	The flight crew presses this key to call up the SEC INIT A page.
[2R] PERF (white)	The flight crew presses this key to call up the performance pages for the secondary flight plan.
[5R] SEC F-PLN PRINT	The flight crew presses this key to print the secondary flight plan report.

A SECONDARY FLIGHT PLAN IS NOT DEFINED



[1L] COPY ACTIVE (blue)	The flight crew presses this key to copy the active flight plan into the secondary flight plan.
[2L] SEC F-PLN (white)	The flight crew presses this key to call up the secondary flight plan pages.
[1R] INIT (white)	The flight crew presses this key to call up the secondary INIT page. It is similar to the active INIT page, but blue brackets replace all the amber boxes.

Ident.: DSC-22_20-50-10-25-M-00007376.0002001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan A and B pages are identical to those of the active flight plan.
They are sequenced automatically only when the secondary flight plan is copied from the primary flight plan and when their active legs are identical.
Pages for the active and secondary flight plans differ from each other as follows :

Secondary lateral revision pages :

- ERASE and INSERT are not displayed.
- OFFSET and FIX INFO are not available.
- A lateral revision of the secondary flight plan does not create a temporary flight plan : All revisions are directly applied to the secondary flight plan.

Secondary vertical revision pages :

- A vertical revision on the secondary flight plan does not create a temporary flight plan.

Secondary step altitude pages

- These pages operate as the primary STEP ALTS page, except that optimal step, savings are not available.

Secondary INIT A and B pages :

- They use blue brackets instead of amber boxes.
- They have no align or realign prompt.
- They do not provide for slewing or entering data in the 4L-4R fields (airport reference)

Secondary wind pages :

- They have no history wind page.

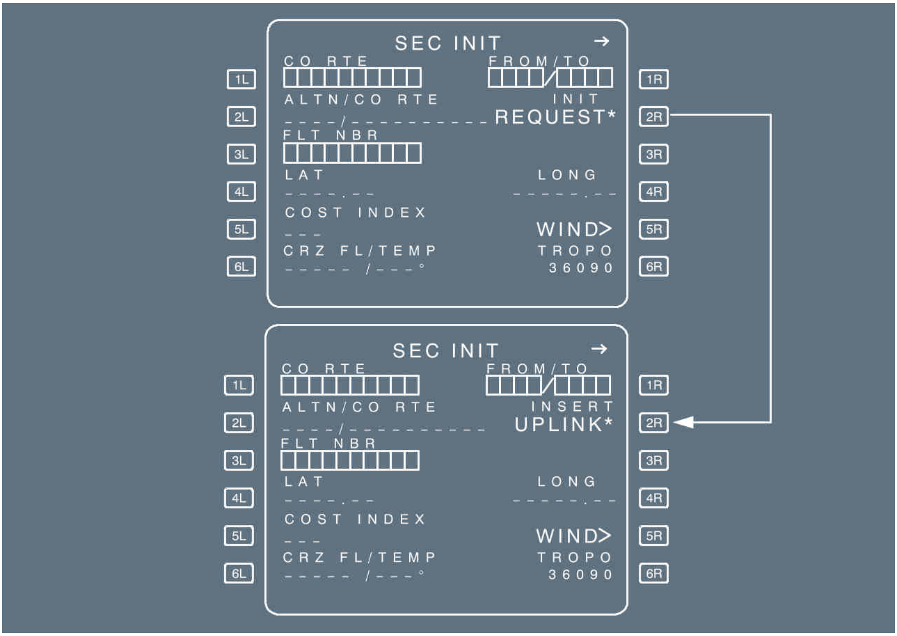
Secondary performance pages :

- All boxes are replaced by blue brackets
- They have no engine out mode, no engine out long range cruise cost index.
- They have no expedite predictions
- They have no ACTIVATE/CONFIRM APPROACH PHASE prompt
- They have no PRED TO ALTN predictions on the PERF CLB and PERF DES pages.
- They have no derated climb ◁* thrust selection on the PERF CLB page
- They have no engine out drift down, no top of descent, no cabin descent rate information on the PERF CRZ page.

The secondary flight plan has no FUEL PRED page.

The secondary INIT A page is also used to request or display an uplink INIT message received after engine start.

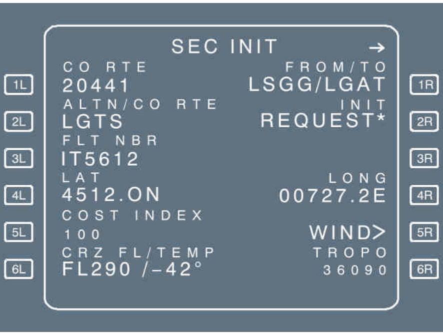
This uplink INIT message can be cleared or inserted as SECONDARY INIT data.


SEC INIT →
CO RTE
FROM/TO
ALTN/CO RTE
----/----------
INIT
REQUEST*
FLT NBR
LAT
----.--
LONG
------.--
COST INDEX

WIND>
CRZ FL/TEMP
----- /---°
TROPO
36090
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SEC INIT →
CO RTE
FROM/TO
ALTN/CO RTE
----/----------
INSERT
UPLINK*
FLT NBR
LAT
----.--
LONG
------.--
COST INDEX

WIND>
CRZ FL/TEMP
----- /---°
TROPO
36090

[2R] INIT REQUEST*	Enable to request INIT data from the ground or,
[2R] INSERT UPLINK*	A downlink message has been received following a request. The message can be cleared or entered in the SEC INIT page.


SEC INIT →
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

CO RTE 20441
FROM/TO LSGG/LGAT
ALTN/CO RTE LGTS
INIT REQUEST*
FLT NBR IT5612
LAT 4512.0N
LONG 00727.2E
COST INDEX 100
WIND>
CRZ FL/TEMP FL290 /-42°
TROPO 36090

SECONDARY INIT A PAGE AFTER UPLINK MESSAGE INSERTION.

Ident.: DSC-22_20-50-10-25-M-00007376.0004001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan A and B pages are identical to those of the active flight plan.
They are sequenced automatically only when the secondary flight plan is copied from the primary flight plan and when their active legs are identical.
Pages for the active and secondary flight plans differ from each other as follows :

Secondary lateral revision pages :

- ERASE and INSERT are not displayed.
- FIX INFO is not available.
- A lateral revision of the secondary flight plan does not create a temporary flight plan :
  All revisions are directly applied to the secondary flight plan.

Secondary vertical revision pages :

- A vertical revision on the secondary flight plan does not create a temporary flight plan.

Secondary step altitude pages

- These pages operate as the primary STEP ALTS page, except that optimal step, savings are not available.

Secondary INIT A and B pages :

- They use blue brackets instead of amber boxes.
- They have no align or realign prompt.
- They do not provide for slewing or entering data in the 4L-4R fields (airport reference)

Secondary wind pages :

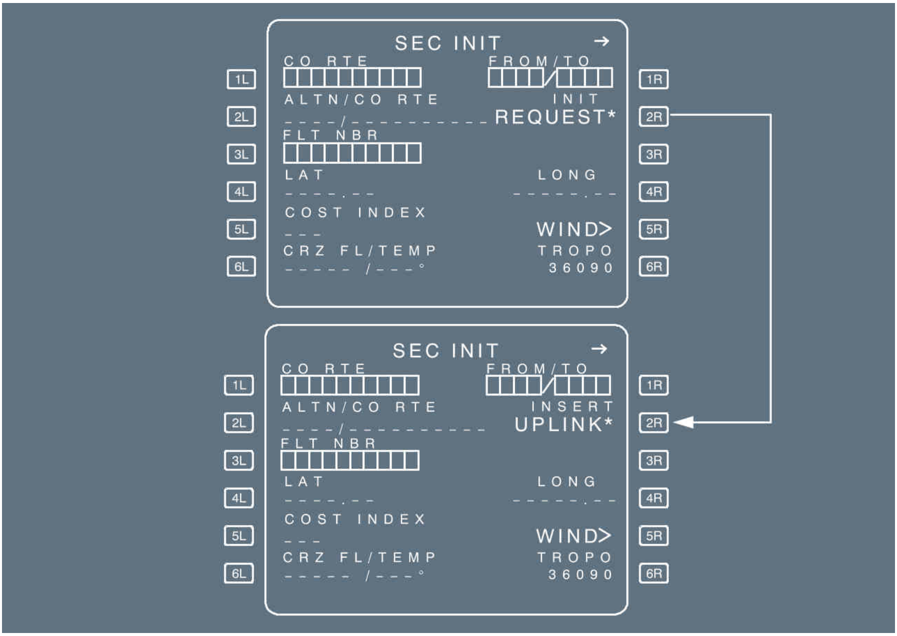
- They have no history wind page.

Secondary performance pages :

- All boxes are replaced by blue brackets
- They have no engine out mode, no engine out long range cruise cost index.
- They have no expedite predictions
- They have no ACTIVATE/CONFIRM APPROACH PHASE prompt
- They have no PRED TO ALTN predictions on the PERF CLB and PERF DES pages.
- They have no derated climb ◁* thrust selection on the PERF CLB page
- They have no engine out drift down, no top of descent, no cabin descent rate information on the PERF CRZ page.

The secondary flight plan has no FUEL PRED page.
The secondary INIT A page is also used to request or display an uplink INIT message received after engine start.

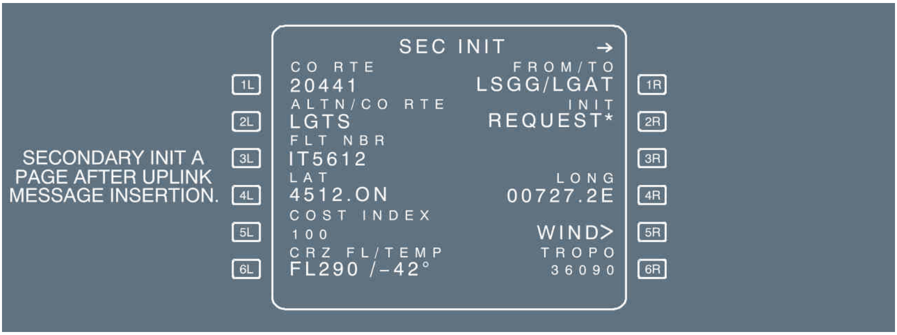
This uplink INIT message can be cleared or inserted as SECONDARY INIT data.


SEC INIT →
CO RTE
FROM/TO
ALTN/CO RTE
----/----------
INIT
REQUEST*
FLT NBR
LAT
----.--
LONG
-----.--
COST INDEX

WIND>
CRZ FL/TEMP
----- /---°
TROPO
36090
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SEC INIT →
CO RTE
FROM/TO
ALTN/CO RTE
----/----------
INSERT
UPLINK*
FLT NBR
LAT
----.--
LONG
-----.--
COST INDEX

WIND>
CRZ FL/TEMP
----- /---°
TROPO
36090

[2R] INIT REQUEST*	Enable to request INIT data from the ground or,
[2R] INSERT UPLINK*	A downlink message has been received following a request. The message can be cleared or entered in the SEC INIT page.


SECONDARY INIT A PAGE AFTER UPLINK MESSAGE INSERTION.
SEC INIT →
CO RTE
20441
FROM/TO
LSGG/LGAT
ALTN/CO RTE
LGTS
INIT
REQUEST*
FLT NBR
IT5612
LAT
4512.0N
LONG
00727.2E
COST INDEX
100
WIND>
CRZ FL/TEMP
FL290 /-42°
TROPO
36090
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

BACK UP NAV PAGES

Applicable to: ALL

Ident.: DSC-22_20-50-10-25-N-00007385.0001001 / 21 MAR 17

GENERAL

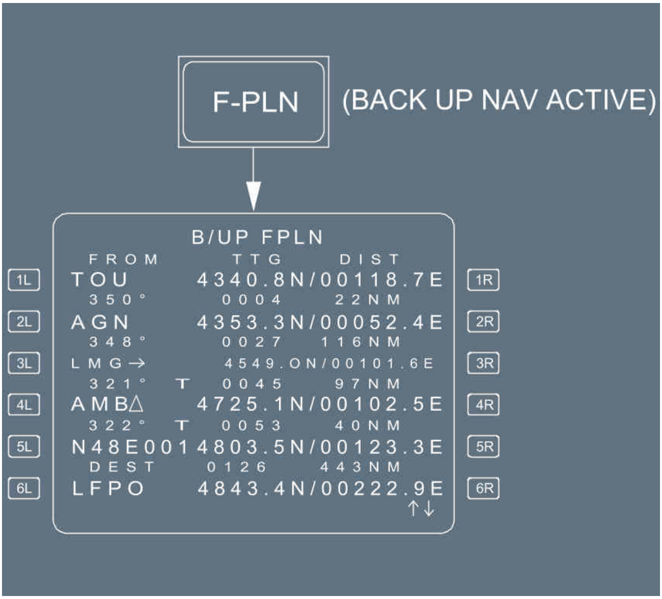
The MCDU features a back up navigation function which provides simplified IRS based navigation in case of a dual FM failure.
BACK UP NAV pages display the data related to the BACK UP NAV function.
During FM normal operation, the F-PLN is continuously downloaded in the MCDU memory: the BACK UP NAV function links the MCDU of the failed FM to its onside IRS.
All navigation data related to the MCDU F-PLN are displayed on the associated ND.
BACK UP NAV function is activated on the MCDU MENU page by depressing the NAV B/UP prompt.
The MCDU back-up F-PLN may accept a maximum of 150 waypoints. It displays only point to point F-PLN (radial, pattern, heading leg... cannot be part of the MCDU F-PLN).
No secondary or temporary F-PLN exists.

These are five pages available while BACK UP NAV is active :
- B/UP F-PLN
- B/UP F-PLN for DIRECT TO
- B/UP PROG
- B/UP IRS for onside IRS (1 or 2)
- B/UP IRS3
- B/UP GPS ◁

Ident.: DSC-22_20-50-10-25-N-00007386.0001001 / 16 MAR 11

B/UP F-PLN PAGE

The B/UP F-PLN page displays the MCDU F-PLN data. The pilot calls up this page by pressing the F-PLN key while B/UP NAV is active.



```
             B/UP FPLN
  FROM          TTG       DIST
TOU         4340.8N/00118.7E
  350°         0004       22NM
AGN         4353.3N/00052.4E
  348°         0027      116NM
LMG→          4549.0N/00101.6E
  321°   T     0045       97NM
AMB△        4725.1N/00102.5E
  322°   T     0053       40NM
N48E0014803.5N/00123.3E
  DEST         0126      443NM
LFPO        4843.4N/00222.9E
                            ↑↓
```

TITLE	B/UP F-PLN is displayed in a white large font

line 1 to line 5	Display consecutive waypoints with their associated latitude/longitude. If a waypoint is to be overflown, an overfly symbol (△) is displayed after the identifier. If a turn is specified into the next leg, a large font arrow is displayed after the identifier. Label lines contain the bearing, time to go and distance to the next waypoint displayed in small font.

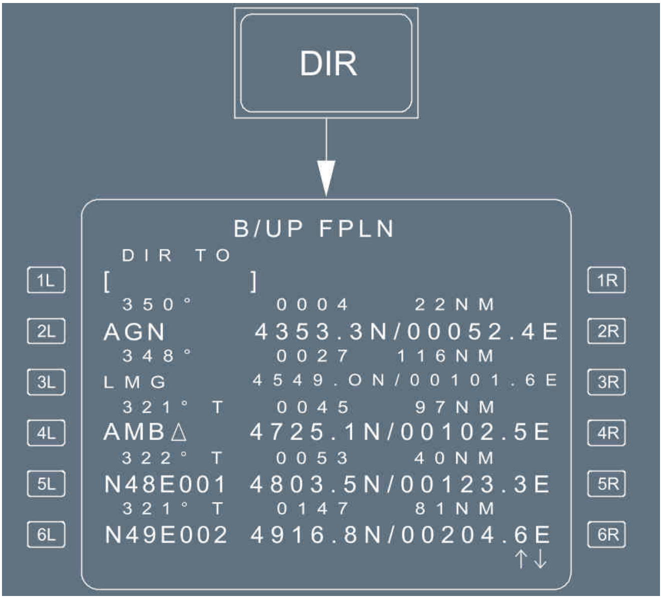
white	bearing
green	time to go and distance
BRG	Between FROM and TO waypoints : True or Mag depending on the TRUE pushbutton position. T is displayed when the bearing is true referenced. Between other waypoints : out bound true track of the great circle joining the 2 related waypoints, independant of TRUE pushbutton switch.
TTG	HHMM limited to 9959. Time between the 2 related waypoints.
DIST	NM limited to 9999.

line 6 DEST	DEST airport identifier and associated latitude/longitude. DIST to destination is computed as the direct distance from the aircraft to the active waypoint plus the along flight plan distances. time to go to destination is computed as distance to destination divided by ground speed. TTG and DEST are dashed if aircraft position is unavailable.

Ident.: DSC-22_20-50-10-25-N-00007387.0001001 / 16 MAR 11

B/UP F-PLN (DIR TO) PAGE

The pilot calls up this page using the DIR key on MCDU while BACK UP NAV is active and aircraft position is valid.



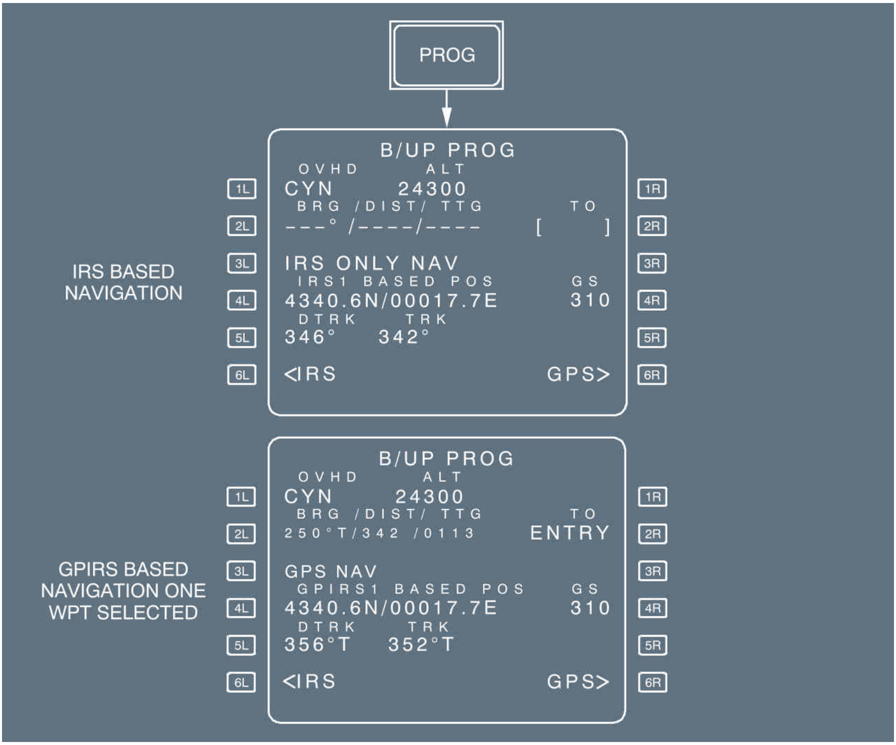
```
            B/UP FPLN
 DIR TO
[          ]
 350°         0004      22NM
AGN       4353.3N/00052.4E
 348°         0027     116NM
LMG       4549.0N/00101.6E
 321° T       0045      97NM
AMB△      4725.1N/00102.5E
 322° T       0053      40NM
N48E001   4803.5N/00123.3E
 321° T       0147      81NM
N49E002   4916.8N/00204.6E
                        ↑↓
```

TITLE	B/UP F-PLN is displayed in a white large font.
[1L] DIR TO	Allows DIRECT TO selection to the desired waypoint. This waypoint can be selected from the F-PLN or manually entered through the scratchpad (IDENT/LAT/LONG or LAT/LONG)
line 2 to line 6	Display consecutive waypoints of the F-PLN. Same as the B/UP F-PLN page. The TO WAYPOINT is displayed in [2L]. Vertical slewing function is available.

Ident.: DSC-22_20-50-10-25-N-00007388.0001001 / 01 OCT 12

B/UP PROG PAGE

It displays flight parameters relative to the F-PLN or a selected waypoint.
The pilot calls up this page by pressing the PROG key on MCDU when BACK UP NAV is active.


PROG
IRS BASED NAVIGATION
GPIRS BASED NAVIGATION ONE WPT SELECTED
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
           B/UP PROG
 OVHD         ALT
CYN         24300
 BRG /DIST/ TTG               TO
---° /----/----          [       ]
IRS ONLY NAV
 IRS1 BASED POS                GS
4340.6N/00017.7E              310
 DTRK       TRK
346°      342°
<IRS                         GPS>
```

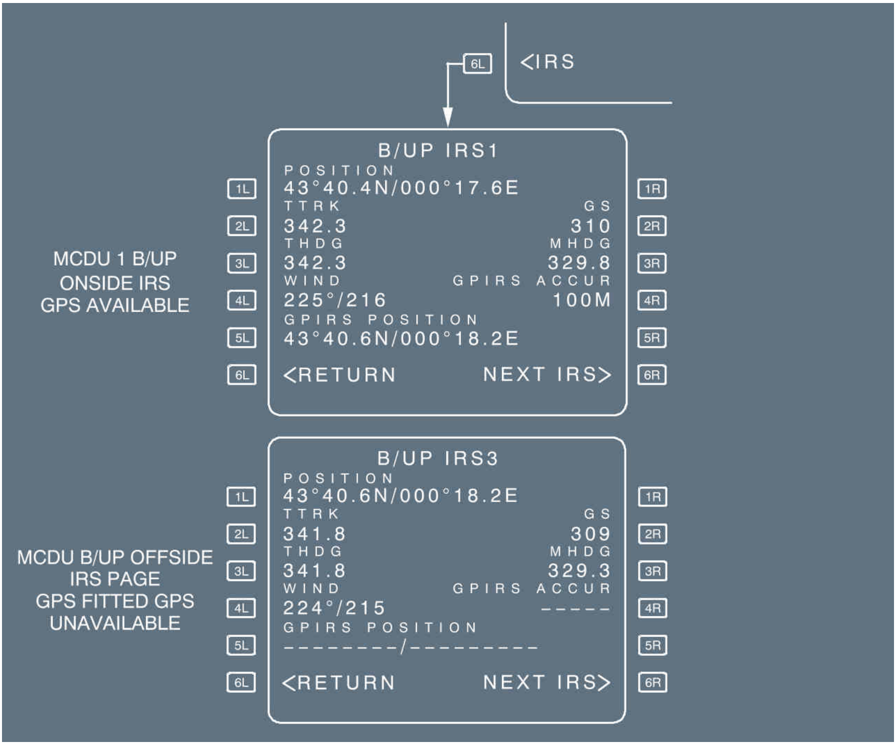
```
           B/UP PROG
 OVHD         ALT
CYN         24300
 BRG /DIST/ TTG               TO
250°T/342 /0113            ENTRY
GPS NAV
 GPIRS1 BASED POS              GS
4340.6N/00017.7E              310
 DTRK       TRK
356°T     352°T
<IRS                         GPS>
```

TITLE	B/UP PROG is displayed in a white large font.
line 1 OVHD/ALT	Displays the identifier of the last sequenced waypoint and the altitude at the time of the sequence.

line 2 BRG/DIST/TTG/TO	Allows the pilot to enter an existing MCDU F-PLN waypoint identifier or LAT/LONG or IDENT/LAT/LONG. MCDU then computes bearing, distance and time to go to that waypoint from the present position. The pilot may modify or clear this entry (2R field). BRG : True or magnetic outbound track of the great circle joining aircraft present position to the entered waypoint: dependent on the TRUE pushbutton switch position. DIST : limited to 9999. TTG : HHMM limited to 9959. time to go to the entered position computed assuming current ground speed. These fields are displayed in a green small font. They are dashed if present position is unavailable.
[3L]	Means of navigation used by the Back-Up Navigation. If GPS is fitted and is the navigation source, “GPS NAV” is displayed, otherwise “IRS ONLY NAV” is displayed. If the GPS is not installed, this field is blank.
[4L] IRS 1 (2 or 3) BASED POS GPIRS 1 (2 or 3) (green)	Current aircraft position provided by the selected IRS GPIRS IRS 1 (or 3 if IRS 1 failed) on MCDU 1 IRS 2 (or 3 if IRS 2 failed) on MCDU 2 GPIRS 1 (or GPIRS 3) or MCDU 1 GPIRS 2 (or GPIRS 3) or MCDU 2
[4R] GS (green)	Current ground speed from the selected IRS or GPS.
[5L] DTRK/TRK (green)	Desired track of the MCDU F-PLN active leg and current aircraft track from the selected IRS/GPS (True or MAG). These tracks are true or magnetic depending on TRUE pushbutton position.
[6L] IRS 1 (2)	Gives access to onside B/UP IRS (1 or 2) page
[6R] GPS	Gives access to B/UP GPS page.

B/UP IRS 1 OR 2 OR 3 PAGE

Display IRS 1, 2, 3 navigation data.
The pilot calls up this page from B/UP PROG page, by pressing the corresponding prompt.


6L
<IRS
MCDU 1 B/UP
ONSIDE IRS
GPS AVAILABLE
MCDU B/UP OFFSIDE
IRS PAGE
GPS FITTED GPS
UNAVAILABLE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
          B/UP IRS1
POSITION
43°40.4N/000°17.6E
TTRK                            GS
342.3                          310
THDG                          MHDG
342.3                        329.8
WIND                   GPIRS ACCUR
225°/216                      100M
GPIRS POSITION
43°40.6N/000°18.2E
<RETURN                  NEXT IRS>
```

```
          B/UP IRS3
POSITION
43°40.6N/000°18.2E
TTRK                            GS
341.8                          309
THDG                          MHDG
341.8                        329.3
WIND                   GPIRS ACCUR
224°/215                     -----
GPIRS POSITION
--------/---------
<RETURN                  NEXT IRS>
```

TITLE	B/UP IRS 1, 2, 3 displayed in a white large font.
[1L] POSITION	Current aircraft position from selected IRS
[2L] T TRK	True track
[2R] GS	Ground speed
[3L] T HDG	True heading
[3R] M HDG	Magnetic heading Dashed when in polar area.

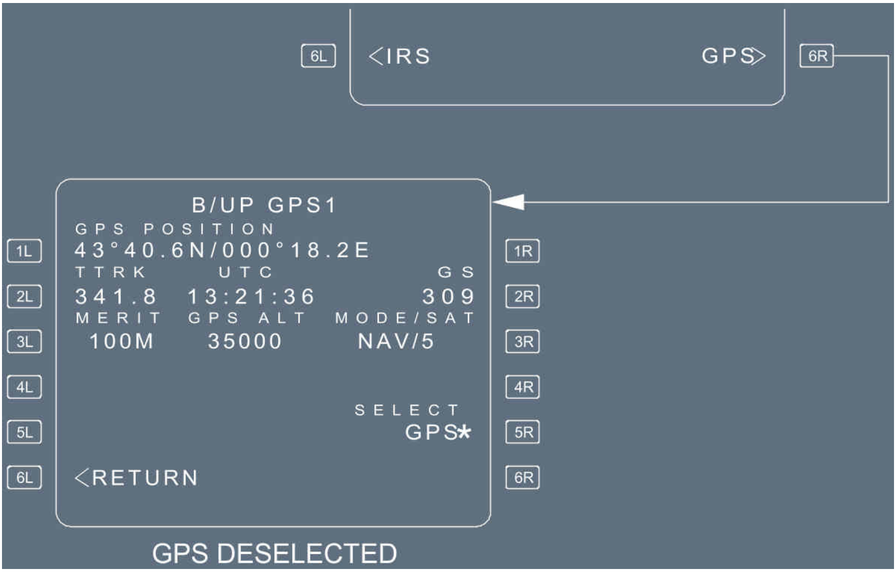
[4L] WIND	Wind direction and velocity Wind direction is always true referenced.
[4R] GPIRS ACCUR	GPS accuracy in meters as in the IRS page.
[5R] GPIRS POSITION	If GPS is installed, the GPS IRS position is provided as in the IRS page.
[6L] RETURN	Gives access to B/UP PROG page
[6R] NEXT IRS	Gives access to the next IRS page. (Closed loop 1 → 2 → 3 → 1)

This page is not modifiable by the crew.

Ident.: DSC-22_20-50-10-25-N-00013002.0001001 / 16 MAR 11

B/UP GPS ◁

Display GPS navigation data.
The pilot calls up this page from B/UP PROG page, by pressing the corresponding prompt.



B/UP GPS1
GPS POSITION
43°40.6N/000°18.2E
TTRK UTC GS
341.8 13:21:36 309
MERIT GPS ALT MODE/SAT
100M 35000 NAV/5
SELECT
GPS*
<RETURN

GPS DESELECTED

TITLE		B/UP GPS 1, 2 displayed in a white large font.
[1L]		GPS POSITION
Line 2	:	TTRK GPIRS position (latitude/longitude) UTC: Time GS: Ground Speed

Line 3 : MERIT: GPS figure of merit
GPS ALT: GPS altitude
MODE/SAT: Navigation mode and number of tracked satellites. These values are displayed as in the FM GPS page.

[5R] DESELECT/SELECT GPS: The pilot may select and deselect the GPS for navigation Backup function. The default configuration is GPS selected.

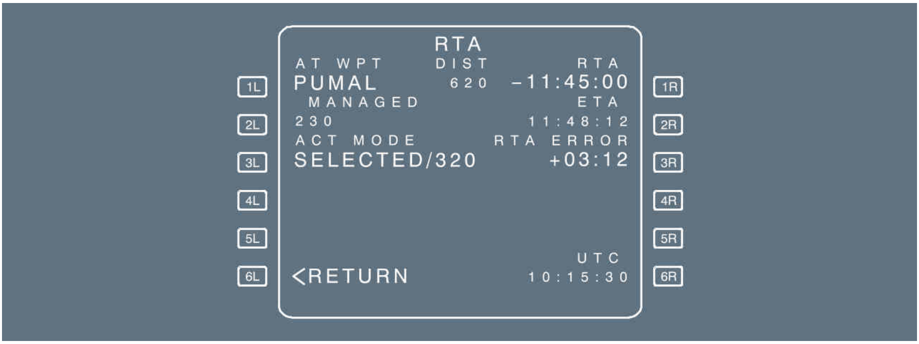
RTA PAGE

Ident.: DSC-22_20-50-10-25-00007390.0003001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Required Time of Arrival (RTA) page allows the entry and display of a waypoint identifier with associated time constraints.

The page also displays the entered or computed Estimated Takeoff Time (ETT) as well as the following data :
- Predicted ETA at the time-constrained waypoint
- Performance adjusted SPD target
- Time error
- Distance to time constrained waypoint
- Active speed mode

The flight crew calls up this page with the RTA prompt from the vertical revision page.



```
                     RTA
 AT WPT             DIST            RTA
PUMAL                620     -11:45:00
  MANAGED                           ETA
230                           11:48:12
ACT MODE                    RTA ERROR
SELECTED/320                   +03:12




                                    UTC
<RETURN                       10:15:30
```

TITLE RTA (large white font)

line 1	This line displays - AT WPT, DIST and RTA when a time constraint can be defined. The identifier of the revised waypoint or the first following waypoint at which the time constraint can be defined, is displayed by default in small blue font - AT WPT, DIST and RTA when a time constraint has already been defined. The associated constrained waypoint identifier is displayed by default in large blue font - AT WPT and white dashes when no time constraint can be defined - AT WPT and blue brackets if a time constraint can only be introduced before the waypoint at which the VERT REV has been initiated. Only when the waypoint identifier has been defined (by the flight crew or by default), blue brackets and a blue start are displayed in [1R] field. The flight crew enters the time constraint as “HHMMSS”, preceded by: “–“ sign for “at or before” “+” sign for “at or after” no sign for “at”.
[2L] MANAGED	This field displays the FMGES-computed ECON speed/Mach (*Refer to DSC-22_20-40-10 Optimization*)
[3L] ACT MODE	This field displays the active speed mode: MANAGED or SELECTED/NNN (NNN is the target speed). The pilot cannot modify it through this field.
[6L] RETURN	The pilot presses this key to revert the display to the VERT REV page.
[2R] ETA	When a required time at arrival has been defined, the 2R field displays the estimated time of arrival as “HHMMSS”.
[3R] RTA ERROR	This field is blank when the RTA is predicted as made. If the RTA is predicted as missed, “RTA ERROR” is displayed in small white font, and the time error between ETA and RTA is displayed in small amber font.
[6R] ETT	The Estimated Takeoff Time (ETT) field is available in the preflight phase. If no ETT is available, the 6R field displays blue brackets and a blue star. Once available, the ETT is displayed in magenta.
UTC	Universal time is displayed in green for takeoff, climb, cruise, descent and approach phases.

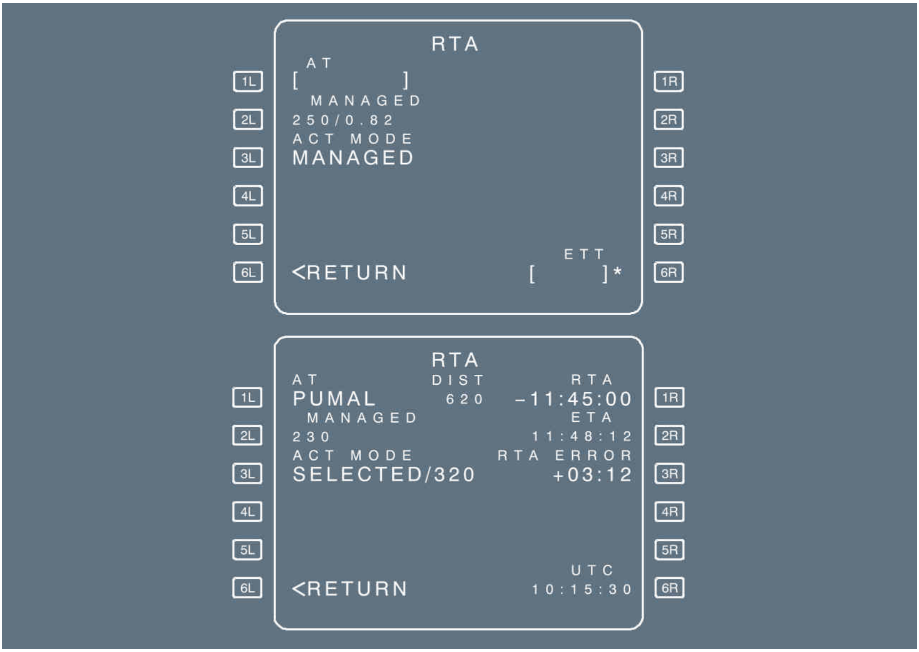
RTA PAGE

Ident.: DSC-22_20-50-10-25-00007390.0001001 / 01 OCT 12
Applicable to: LV-GKO, LV-GKP

The Required Time of Arrival (RTA) page allows the entry and display of a waypoint identifier with associated time constraints. The page also displays the entered or computed.

Estimated Takeoff Time (ETT) as well as the following data :
- Predicted ETA at the time-constrained waypoint ;
- Performance adjusted SPD target ;
- Time error ;
- Distance to time constrained waypoint ;
- Active speed mode ;

The pilot calls up this page with the RTA prompt from the vertical revision page.



```
                RTA
  AT
[            ]
   MANAGED
250/0.82
ACT MODE
MANAGED




                              ETT
<RETURN                   [     ]*
```

```
                RTA
AT              DIST          RTA
PUMAL            620    -11:45:00
   MANAGED                    ETA
230                      11:48:12
ACT MODE            RTA ERROR
SELECTED/320               +03:12




                              UTC
<RETURN                  10:15:30
```

TITLE	RTA (large white font)

line 1	This line displays AT and blue brackets, if no time constraints exist, or AT, DIST and RTA when a time constraint has been defined. The waypoint identifier is displayed in large blue font. If only the waypoint identifier has been defined, blue brackets and a blue star are displayed facing the 1R prompt. The pilot enters the time constraint as “HHMMSS”, preceeded by : – for at or before ; + for at or after ; no sign for at.
[2L] MANAGED	This field displays the FMGES-computed ECON speed/Mach (*Refer to DSC-22_20-10 General*)
[3L] ACT MODE	This field displays the active speed mode : MANAGED or SELECTED/NNN (NNN is the target speed). The pilot cannot modify it through this field.
[6L] RETURN	The pilot presses this key to revert the display to the VERT REV page.
[2R] ETA	When a required time at arrival has been defined, the 2R field displays the estimated time of arrival as “HHMMSS”.
[3R] RTA ERROR	This field is blank when the RTA is predicted as made. If the RTA is predicted as missed, “RTA ERROR” is displayed in small white font, and the time error between ETA and RTA is displayed in small amber font.
[6R] ETT	The Estimated Takeoff Time (ETT) field is available in the preflight phase. If no ETT is available, the 6R field displays blue brackets and a blue star. Once available, the ETT is displayed in magenta.
UTC	Universal time is displayed in green for takeoff, climb, cruise, descent and approach phases.

Intentionally left blank

GENERAL

Ident.: DSC-22_20-50-20-00026040.0001001 / 03 NOV 23
Applicable to: ALL

Two types of MCDU messages exist:
- Type I: Direct result of a flight crew action
- Type II: Information about a situation, or an action request to the flight crew.

Type II messages are stored in a first-in/first-out message queue (5 messages maximum).
They are suppressed, if correct data is entered, or when they no longer apply.
The flight crew can clear all messages by pressing the CLR key on the MCDU console.

A/C POSITION INVALID

Ident.: DSC-22_20-50-20-00026041.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft position is no longer valid. If the flight crew clears the message, the message appears again if the flight crew displays the HOLD at PPOS or the DIR TO page.

ALIGN IRS

Ident.: DSC-22_20-50-20-00026044.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	At least one IRS waits for an alignment position. The flight crew should initiate the alignment via the IRS INIT page in the MCDU.

ALT CSTR ABOVE CRZ FL

Ident.: DSC-22_20-50-20-00026045.0003001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	A flight plan altitude constraint is disregarded because it is above the cruise altitude or a descent step altitude. The message is displayed upon one of the following conditions: - The flight crew modifies the current cruise altitude or enters a new one, or - The flight crew modifies, deletes or creates a descent step altitude, or - The flight crew activates the SEC F-PLN.

AOC XXX F-PLN UPLINK

Ident.: DSC-22_20-50-20-00026452.0005001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	A F-PLN uplink is inserted in the active or secondary F-PLN. XXX corresponds either to ACT for the active F-PLN, or to SEC for the secondary F-PLN.

AREA RNP IS XX.XX

Ident.: DSC-22_20-50-20-00026048.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew entered an RNP value on the PROG page, and the following conditions are applicable: - The manually entered value is more than the default RNP value of the current flight phase - There is no RNP value defined in the navigation database for the active flight leg or route. XX.XX is the current RNP value.

AWY/WPT MISMATCH

Ident.: DSC-22_20-50-20-00026049.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters an airway ident in the VIA field on the AIRWAYS page, but it does not contain the revised point. If the flight crew enters a second airway ident, it must contain the first airway ending point.

BLOCK IGNORES RTA

Ident.: DSC-22_20-50-20-00026050.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The fuel planning function ignores one of the following: - A time constraint that exists at initialization of the F-PLN, or - The entry of a time constraint made after the initialization of the F-PLN.

CABIN RATE EXCEEDED

Ident.: DSC-22_20-50-20-00026051.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is in the cruise phase, at less than 200 NM from the destination, and the cabin rate, that is associated with the theoretical descent profile, is more than the maximum cabin rate. The flight crew can check or change the maximum cabin rate on the PERF CRZ page.

CHECK ALTN WIND

Ident.: DSC-22_20-50-20-00026479.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind data uplink associated with an alternate cruise flight level via uplink that is different from the current FMS alternate cruise flight level.

CHECK APPR SELECTION

Ident.: DSC-22_20-50-20-00026054.0008001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The flight crew manually tuned an ILS/GLS approach on the RADIO NAV page. This manually-tuned landing system does not correspond to the approach that is selected in the F-PLN. The message appears only when the aircraft is: - In cruise, and at less than 100 NM from the T/D, or - In descent, or - In approach, and the altitude is above 700 ft. In approach, pressing the APPR pb arms LOC and G/S modes on the manually-tuned landing system.

CHECK APPR SELECTION

Ident.: DSC-22_20-50-20-00026054.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The flight crew manually tuned an ILS/GLS approach on the RADIO NAV page. This manually-tuned landing system does not correspond to the approach that is selected in the F-PLN. The message appears only when the aircraft is: - In cruise, and at less than 100 NM from the T/D, or - In descent, or - In approach, and the altitude is above 800 ft. In approach, pressing the APPR pb arms APP NAV and FINAL modes.

CHECK CO RTE

Ident.: DSC-22_20-50-20-00026457.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a F-PLN uplink with a company route ident that is different from the company route ident specified in the F-PLN request.

CHECK DATA BASE CYCLE

Ident.: DSC-22_20-50-20-00026055.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The current date disagrees with the validity period of the active navigation database. This message appears when the flight crew enters a FROM/TO airport or a company route.

CHECK DEST DATA

Ident.: DSC-22_20-50-20-00026476.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is in cruise phase and at less than 180 NM from its destination and one of the following conditions occur: - QNH, TEMP, or WIND data are received via a PERF APPR uplink, or - A descent wind uplink is received and creates a conflict with the QNH, TEMP or WIND data already displayed on the PERF APPR page.

CHECK FLT NBR

Ident.: DSC-22_20-50-20-00026458.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a flight number via uplink that is different from the flight number specified in the F-PLN request.

CHECK IRS 1(2)(3)/FM POSITION

Ident.: DSC-22_20-50-20-00026057.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the ADIRS alignment position and the FMS position is more than a threshold that is a function of time.

CHECK IRS/AIRPORT POS

Ident.: DSC-22_20-50-20-00026229.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the ADIRS alignment position and the airport position is 5 NM or more.

CHECK WEIGHT

Ident.: DSC-22_20-50-20-00026059.0020001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	Before engine start: The flight crew activates the SEC F-PLN, and the secondary ZFW/ZFWCG differs from the active ZFW/ZFWCG. After engine start: One of the following conditions occurs: - The difference between the FMS GW and FAC GW is more than 7 t, or - The flight crew activates the SEC F-PLN, and the difference between the ZFW/ZFWCG from SEC INIT FUEL PRED page and from FUEL PRED page is more than 5 t.

CHECK WEIGHT

Ident.: DSC-22_20-50-20-00026059.0011001 / 03 NOV 23
Applicable to: LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	Before engine start: The flight crew activates the SEC F-PLN, and the secondary ZFW/ZFWCG differs from the active ZFW/ZFWCG. After engine start: One of the following conditions occurs: - The difference between the FMS GW and FAC GW is more than 7 t, or - The flight crew activates the SEC F-PLN, and the difference between the ZFW/ZFWCG from SEC INIT B page and from FUEL PRED page is more than 5 t.

CHECK WEIGHT

Ident.: DSC-22_20-50-20-00026059.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS GW and the FAC GW is more than 7 t.

CHECK MIN DEST FOB

Ident.: DSC-22_20-50-20-00026060.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually enters the MIN DEST FOB value, which is below the ALTN + FINAL value.

CHECK NORTH REF

Ident.: DSC-22_20-50-20-00026231.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The position of the NORTH REF pb-sw disagrees with the airport north reference, which is stored in the FMS navigation database. This message appears either for the departure airport (in preflight), or for the destination airport (in arrival or approach).

CHECK ONSIDE P/N

Ident.: DSC-22_20-50-20-00026232.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The part numbers of the FMCs are not compatible. The MCDU automatically displays the P/N STATUS page.

CHECK QFE

Ident.: DSC-22_20-50-20-00026063.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The QFE height and the predicted aircraft altitude differ by more than 100 ft. For this computation, the FMS uses the QNH entry of the PERF APPR page, and the destination airport elevation from the navigation database. This message appears, in descent or approach, when the flight crew changes the barometric reference from QNH(STD) to QFE.

CHECK TAKE OFF DATA

Ident.: DSC-22_20-50-20-00026233.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew already entered the takeoff speeds, and changes the takeoff runway, the flaps setting, or the takeoff shift, the FLEX TO temperature or the Derated Level ◁ .

CLK IS TAKE OFF TIME

Ident.: DSC-22_20-50-20-00026065.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The clock time passed the ETT (either entered by the flight crew or computed by the system).

CLOCK/GPS TIME DIFF

Ident.: DSC-22_20-50-20-00026234.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the aircraft clock time and the GPS time is more than 3 min.

CLOSE RTE REQ FIRST

Ident.: DSC-22_20-50-20-00026483.0007001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew requests an ATC F-PLN for a second time, and the flight crew did not close, nor cancel the first ATC F-PLN request on the DCDU within the two minutes delay period.

CROSSLOAD ABORTED

Ident.: DSC-22_20-50-20-00026070.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	An error of transmission from one FMS to another occurs.

CROSSLOAD COMPLETE

Ident.: DSC-22_20-50-20-00026071.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The database crossload from one FMS to another is successfully completed.

CRZ FL ABOVE MAX FL

Ident.: DSC-22_20-50-20-00026072.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew enters a flight level that is above the recommended maximum flight level.

CSTR DEL ABOVE CRZ FL

Ident.: DSC-22_20-50-20-00026073.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	A F-PLN altitude constraint is deleted because it is at or above the cruise altitude or a step altitude. The message is displayed when one of the following conditions occurs: - The flight crew modifies the current cruise altitude or enters a new one, or - The flight crew modifies, deletes or creates a step altitude.

CSTR DEL UP TO XXXXXXX

Ident.: DSC-22_20-50-20-00026074.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight phase changes from the cruise / descent / approach phase to the go-around phase. As a result, all altitude and speed constraints between the aircraft and the destination airport are automatically deleted. XXXXXXX corresponds to the ident of the waypoint that is after the last down-path waypoint with a descent altitude or speed constraint.

DATABASE CODING ERROR

Ident.: DSC-22_20-50-20-00026235.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS does not recognize an element from the navigation database, nor an element inserted by the flight crew in the F-PLN.

DECELERATE

Ident.: DSC-22_20-50-20-00026236.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The managed speed/Mach control is engaged, the aircraft reaches the T/D, and the FMS does not switch to the descent phase.

DELETING OFFSET

Ident.: DSC-22_20-50-20-00026079.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The system automatically deletes an offset when: - The distance remaining to the end of the offset is too short to be flown, or - The ALTN F-PLN is activated, or - Both the start and end waypoints of the offset are deleted, or - A DIR TO, DIR TO/ABEAM, or DIR TO/INTCPT is inserted beyond the start waypoint.

DELETING OFFSET

Ident.: DSC-22_20-50-20-00026079.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

Message Type	II
Display Type	MCDU
Display Conditions	The system automatically deletes an offset when: - An offset is no longer compatible with the active lateral F-PLN, or - A lateral revision occurs, or - The distance remaining to the end of the offset is too short to be flown.

DELETING SEC OFFSET

Ident.: DSC-22_20-50-20-00026080.0005001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The system automatically deletes a secondary offset when: - The distance remaining to the end of the offset is too short to be flown, or - An ATC F-PLN request is performed.

DEST EFOB BELOW MIN

Ident.: DSC-22_20-50-20-00026081.0004001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	The EFOB at the destination airport of the active F-PLN is below the specified minimum fuel at destination, for more than 2 min. This message appears, only if one of the following applies: - The aircraft is in the approach phase and is above 800 ft AGL, or - The aircraft is in the go-around phase and is above 800 ft AGL, or - The ALT mode is engaged for more than 10 min, or - The aircraft is in the cruise or descent phase.

DEST EFOB BELOW MIN

Ident.: DSC-22_20-50-20-00026081.0001001 / 03 NOV 23
Applicable to: LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The EFOB at the destination airport of the active F-PLN is below the specified minimum fuel at destination, for more than 2 min. This message appears, only if one of the following applies: - The aircraft is in the takeoff phase and is above 800 ft AGL, or - The aircraft is in the approach phase and is above 800 ft AGL, or - The aircraft is in the go-around phase and is above 800 ft AGL, or - The ALT mode is engaged for more than 10 min, or - The aircraft is in the cruise or descent phase.

DEST/ALTN MISMATCH

Ident.: DSC-22_20-50-20-00026082.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a company alternate route, and the departure airport of the company alternate route disagrees with the destination airport of the F-PLN.

DIR TO IN PROCESS

Ident.: DSC-22_20-50-20-00026083.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew requests the display of the vertical or lateral revision page on one MCDU, while the other MCDU displays the DIR TO page.

ENTER DEST DATA

Ident.: DSC-22_20-50-20-00026084.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	All of the following occur: - The flight crew did not enter one or more of the destination data (QNH, OAT, or wind) - The flight phase is: - The cruise phase, and the aircraft is at less than 180 NM from the destination, or - The descent phase, or - The approach phase.

ENTRY OUT OF RANGE

Ident.: DSC-22_20-50-20-00026085.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a value that is not within the acceptable range of the data.

EXTEND SPD BRK

Ident.: DSC-22_20-50-20-00026238.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD
Display Conditions	DES is engaged or FINAL APP is engaged except in CONF 3 or FULL, and the flight crew should extend the speed brakes to comply with an altitude constraint, a speed limit or a speed constraint.

F-G/S BASED ON ISA

Ident.: DSC-22_20-50-20-00026086.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The computation of the F-G/S deviation is based on the ISA temperature at destination, and not corrected with the current temperature at destination. The message appears when all of the following occur: - The FLS guidance is selected - The flight crew did not enter the temperature at destination (OAT) on the PERF APPR page - The LS pb is pressed on the EFIS control panel - The descent or the approach phase is activated.

F-PLN DATALINK IN PROG

Ident.: DSC-22_20-50-20-00026455.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to modify the F-PLN before the uplink of a F-PLN INIT is complete.

F-PLN ELEMENT RETAINED

Ident.: DSC-22_20-50-20-00026268.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to delete flight crew-stored navaids, waypoints or runways that are currently used by the FMS. The message informs the flight crew that the elements that are still used by the FMS are not deleted.

F-PLN FULL

Ident.: DSC-22_20-50-20-00026089.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The F-PLN data memory is exceeded.

F-PLN UPLINK -XX REJ

Ident.: DSC-22_20-50-20-00026487.0002001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects XX elements of the ATC F-PLN. XX corresponds to the number of elements rejected by the FMS. The ATC REJ INFO page displays the rejected elements.

FLS ◁ SEL: UPDATE MINIMA

Ident.: DSC-22_20-50-20-00026301.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew deselects the SLS ◁ in RADIO NAV page and the guidance mode reverts to FLS ◁ . LP or LPV minima can no longer be used. The flight crew should modify the approach minima to LNAV/VNAV or LNAV, if available, or select another adequate approach.

FLT NBR UPLINK

Ident.: DSC-22_20-50-20-00026459.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a flight number not requested by the flight crew as part of the F-PLN data uplink.

FM DATALINK UNAVAIL

Ident.: DSC-22_20-50-20-00026484.0002001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The communication between the ATSU and both FMS is not available.

FMS SETTING SPD/RTA

Ident.: DSC-22_20-50-20-00026091.0003001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	The system updates the managed speed target to satisfy the RTA constraints. The managed speed target is frozen during the update.

FMS1/FMS2 A/C STS DIFF

Ident.: DSC-22_20-50-20-00026093.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	At power-up, the critical aircraft status data is not identical between FMS1 and FMS2. The critical aircraft status data is: - Navigation database - Performance database - Magnetic variation database - AMI file - FM operational program - Aircraft and airline program pins.

FMS1/FMS2 GW DIFF

Ident.: DSC-22_20-50-20-00026095.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS1 GW and the FMS2 GW is 1.5 t or more.

FMS1/FMS2 PGM PIN DIFF

Ident.: DSC-22_20-50-20-00026096.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The program pins are not identical between FMS1 and FMS2.

FMS1/FMS2 POS DIFF

Ident.: DSC-22_20-50-20-00026094.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS1 position and the FMS2 position is 0.5 NM or more. It is 5 NM when the GPS is not installed.

FMS1/FMS2 SPD TGT DIFF

Ident.: DSC-22_20-50-20-00026097.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The difference between the FMS1 speed target and the FMS2 speed target is 5 kt or more.

FORMAT ERROR

Ident.: DSC-22_20-50-20-00026098.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The format of the value, entered by the flight crew, is not correct (*Refer to DSC-22_20-50-30 MCDU Data Format List*).

GPS ◁ IS DESELECTED

Ident.: DSC-22_20-50-20-00026101.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually deselected the GPS, and: - The aircraft is at 80 NM from the T/D, or - The aircraft is in the approach phase.

GPS PRIMARY ◁

Ident.: DSC-22_20-50-20-00026102.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	For the computation of the aircraft position, at least one of the following conditions was no longer achieved, and both conditions are now achieved again: - The navigation mode is IRS/GPS - The navigation accuracy is HIGH.

GPS PRIMARY ◁ LOST

Ident.: DSC-22_20-50-20-00026103.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	For the computation of the aircraft position, at least one of the following conditions is applicable: - The navigation mode is not IRS/GPS - The navigation accuracy is not HIGH.

INDEPENDENT OPERATION

Ident.: DSC-22_20-50-20-00026104.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	FMS1 and FMS2 operate in independent mode (*Refer to DSC-22_10-30 Independent Mode*).

INITIALIZE ZFW/ZFWCG

Ident.: DSC-22_20-50-20-00026299.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	At engine start, the flight crew has not entered a ZFW or ZFWCG value on the INIT B/INIT FUEL PRED page. The flight crew can enter the ZFW or ZFWCG on the FUEL PRED page to clear the message, since the INIT B/INIT FUEL PRED page is no longer accessible.

INVALID ATC UPLINK

Ident.: DSC-22_20-50-20-00026485.0002001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects an ATC F-PLN uplink because it is invalid.

INVALID F-PLN UPLINK

Ident.: DSC-22_20-50-20-00026454.0002001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a F-PLN uplink because it is not valid.

INVALID FLT NBR UPLINK

Ident.: DSC-22_20-50-20-00026460.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a flight number that is part of the F-PLN data uplink because it is not valid.

INVALID PERF UPLINK

Ident.: DSC-22_20-50-20-00026464.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a performance initialization uplink because it is not valid.

INVALID TAKEOFF UPLINK

Ident.: DSC-22_20-50-20-00026469.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a takeoff data uplink because it is not valid.

INVALID WIND UPLINK

Ident.: DSC-22_20-50-20-00026472.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS rejects a wind data uplink because it is not valid.

LARGE NDB NOT ALLOWED

Ident.: DSC-22_20-50-20-00026109.0003001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	Then navigation database, that is loaded, is larger than the size supported by the FMS. The FMS is locked at power-up. The MCDU remains locked on the P/N STATUS page or the AIRCRAFT STATUS page with the following displays: - LARGE NDB NOT ALLOWED on the MCDU scratchpad - INCOMPLETE on the P/N line (on the P/N STATUS page).

LAT DISCONT HEAD

Ident.: DSC-22_20-50-20-00026110.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is at 30 s or less from flying a flight plan discontinuity.

LIST OF 10 IN USE

Ident.: DSC-22_20-50-20-00026111.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The number of flight crew-stored runways, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 10, and the FMS rejects the attempt to create a new runway in the NEW RUNWAY page.

LIST OF 20 IN USE

Ident.: DSC-22_20-50-20-00026243.0003001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	I
Display Type	MCDU
Display Conditions	The number of flight crew-stored NAVAIDs or the number of flight crew-stored waypoints, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 20, and the FMS rejects the attempt to create a new NAVAID or a new waypoint.

Message Type	II
Display Type	MCDU
Display Conditions	The number of flight crew-stored waypoints, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 20, and the FMS rejects the additional waypoints received via uplink.

LIST OF 20 IN USE

Ident.: DSC-22_20-50-20-00026243.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	I
Display Type	MCDU
Display Conditions	The number of flight crew-stored NAVAIDs, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 20, and the FMS rejects the attempt to create a new NAVAID.

LIST OF 99 IN USE

Ident.: DSC-22_20-50-20-00026246.0006001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	I
Display Type	MCDU
Display Conditions	The number of flight crew-stored waypoints, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 99, and the FMS rejects the attempt to create a new waypoint.

Message Type	II
Display Type	MCDU
Display Conditions	The number of flight crew-stored waypoints, that are currently used by the FMS (in the F-PLN or in flight crew-stored routes), already reached the limit of 99, and the FMS rejects the additional waypoints received via uplink

MACH SEGMENT DELETED

Ident.: DSC-22_20-50-20-00026069.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The Constant Mach Segment (CMS) is automatically deleted in the active F-PLN, when one of the following occurs: - The flight crew activates the SEC F-PLN, or - An engine-out is detected, or - The flight phase changes from the cruise phase to another flight phase, or - The flight crew enters a lateral revision of the F-PLN which deletes the CMS.

MCDU OVERHEATED

Ident.: DSC-22_20-50-20-00026248.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The MCDU temperature exceeds the normal operating conditions. The MCDU displays a blank screen when idle, as it is in power saving mode.

NAV ACCUR DOWNGRAD

Ident.: DSC-22_20-50-20-00026117.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The navigation accuracy changed from HIGH to LOW. For more information, *Refer to DSC-22_20-20-20 Estimated Position Uncertainty*.

NAV ACCUR UPGRAD

Ident.: DSC-22_20-50-20-00026118.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The navigation accuracy changed from LOW to HIGH. For more information, *Refer to DSC-22_20-20-20 Estimated Position Uncertainty*.

NEW ACC ALT - HHHH

Ident.: DSC-22_20-50-20-00026249.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	On a climb waypoint, the flight crew enters an AT or AT OR BELOW altitude constraint. As a result, the FMS considers that the aircraft levels off below the acceleration altitude. The constraint altitude becomes the new acceleration altitude. HHHH corresponds to the altitude of the altitude constraint.

NEW CRZ ALT - HHHHH

Ident.: DSC-22_20-50-20-00026251.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The cruise flight level (on the INIT page or the PROG page) is automatically updated when the flight crew enters a new cruise altitude. HHHHH corresponds to the new cruise flight level.

NEW THR RED ALT - HHHH

Ident.: DSC-22_20-50-20-00026253.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	On a climb waypoint, the flight crew enters an AT or AT OR BELOW altitude constraint. As a result, the FMS considers that the aircraft levels off below the thrust reduction altitude. The constraint altitude becomes the new thrust reduction altitude. HHHH corresponds to the altitude of the altitude constraint.

NO ANSWER TO REQUEST

Ident.: DSC-22_20-50-20-00026481.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The FMS receives no answer to a datalink request that the flight crew sent more than four minutes ago.

NO FLS FOR THIS APPR

Ident.: DSC-22_20-50-20-00026263.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS does not compute the FLS beam for the approach that the flight crew selected. The FLS function is not available.

NO INTERSECTION FOUND

Ident.: DSC-22_20-50-20-00026255.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The FMS can neither find a shared waypoint nor an intersection during: - The addition of a VIA in the AIRWAYS page, or - The addition of a LAT/LONG crossing waypoint in the LAT REV page (LL XING / INCR/ NO).

NO NAV INTERCEPT

Ident.: DSC-22_20-50-20-00026127.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	HDG(TRK) mode is engaged, and NAV mode is armed. NAV mode cannot engage, because the current aircraft trajectory does not intersect the FMS F-PLN before the TO waypoint.

NO SLS FOR THIS APPR

Ident.: DSC-22_20-50-20-00026302.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	All of the following conditions occur: - SBAS mode is selected in the SELECTED NAVAIDS page in the MCDU - The MMRs cannot decode the Final Approach Segment data block.

NO SLS ◁ MAN TUNING

Ident.: DSC-22_20-50-20-00026303.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew tries to tune the SLS ◁ manually.

NO SLS ◁ : SBAS DESELECTED

Ident.: DSC-22_20-50-20-00026304.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew selects the SLS ◁ in the RADIO NAV page while SBAS ◁ is deselected on the SELECTED NAVAIDS page in the MCDU.

NON UNIQUE ROUTE IDENT

Ident.: DSC-22_20-50-20-00026129.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	On the NEW ROUTE page, the flight crew attempts to enter a company route ident that already exists in the navigation database or in the flight crew-stored elements database.

NOT ALLOWED

Ident.: DSC-22_20-50-20-00026130.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The data entry or the data selection is not permitted.

NOT ALLOWED IN NAV

Ident.: DSC-22_20-50-20-00026256.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	NAV mode is engaged and the flight crew attempts to modify the TO waypoint.

NOT IN DATABASE

Ident.: DSC-22_20-50-20-00026132.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters the ident of an element that is neither in the navigation database, nor in the flight crew-stored elements database. The entered element can be one of the following: - A company route identifier - A FROM/TO waypoint - A place (airport, runway, waypoint, NAVAID) - A NAVAID frequency.

NOT XMITTED TO ACARS

Ident.: DSC-22_20-50-20-00026480.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually sends a downlink message through an MCDU page and the communication fails during the data transfer.

ONLY SPD ENTRY ALLOWED

Ident.: DSC-22_20-50-20-00026135.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The aircraft is not in the climb phase, and the flight crew attempts to enter a MACH value in the PRESEL field of the PERF CLB page.

PAGE UPDATE IN PROCESS

Ident.: DSC-22_20-50-20-00026137.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The update of the predictions is in progress, and the flight crew presses a key on the F-PLN page.

PERF DATA UPLINK

Ident.: DSC-22_20-50-20-00026461.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives performance initialization data, as part of a F-PLN uplink.

PLACE/D IN TRANSITION

Ident.: DSC-22_20-50-20-00026259.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	I
Display Type	MCDU
Display Conditions	The FMS rejects the flight crew entry, defined as a place/distance waypoint within a planned fixed-turn-radius transition between two flight legs.

PLEASE WAIT

Ident.: DSC-22_20-50-20-00026142.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The synchronization between both FMS is in progress.

PRINTER NOT AVAILABLE

Ident.: DSC-22_20-50-20-00026482.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	Communication with the printer is interrupted while printing a report.

PROCEDURE RNP IS XX.XX

Ident.: DSC-22_20-50-20-00026262.0007001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually enters an RNP value on the PROG page, and the entered value is more than the RNP value, defined in the navigation database for the active leg or route. XX.XX is the RNP value defined in the navigation database.

PROCEDURE RNP IS XX.XX

Ident.: DSC-22_20-50-20-00026262.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually enters an RNP value on the PROG page, and the entered value is more than or equal to the RNP value, defined in the navigation database for the active leg or route. XX.XX is the RNP value defined in the navigation database.

RADIONAV IS DESELECTED

Ident.: DSC-22_20-50-20-00026270.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually deselected the radio NAVAIDS on the SELECTED NAVAIDS page, and: - The aircraft is at 80 NM from the T/D, or - The aircraft is in the approach phase.

REENTER WEIGHT/CG

Ident.: DSC-22_20-50-20-00026298.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew enters a ZFW/ZFWCG that differs from the ZFW/ZFWCG received from the FCMC differ by more than 0.1 t (0.2 klb) or 0.1 %. The flight crew should enter again the ZFW and ZFWCG values.

REENTER ZFW/ZFWCG

Ident.: DSC-22_20-50-20-00026297.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew enters a ZFW/ZFWCG that differs from the ZFW/ZFWCG received from the FCMC differ by more than 0.1 t (0.2 klb) or 0.1 %. The flight crew should enter again the ZFW and ZFWCG values.

REF/GPS POS DIFF ◁

Ident.: DSC-22_20-50-20-00026146.0003001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a reference position on the IRS INIT page, which differs with the GPS position.

REF/LAST IRS POS DIFF

Ident.: DSC-22_20-50-20-00026271.0003001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew enters a reference position on the IRS INIT page, which differs with the last stored IRS position.

RESET IRS TO NAV

Ident.: DSC-22_20-50-20-00026148.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew modified the aircraft position on the INIT A page after the IRS alignment. In order to align the IRS with the modified position, the flight crew must reset the IRS to NAV mode.

RETRACT SPD BRK

Ident.: DSC-22_20-50-20-00026300.0005001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU and PFD
Display Conditions	Speedbrakes are extended, DES mode or FINAL APP mode is engaged, and one of the following occurs: - The aircraft is below the path and back on speed target, or - The aircraft is below the path.

RETRACT SPD BRK

Ident.: DSC-22_20-50-20-00026300.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU and PFD
Display Conditions	Speedbrakes are extended, DES mode or FINAL APP mode is engaged, and one of the following occurs: - ALT* or ALT CST* or ALT CRZ* or ALT or ALT CST or ALT CRZ mode engages, or - The aircraft is below the path, or - The flaps configuration becomes CONF 3 or FULL.

REVISIONS NOT STORED

Ident.: DSC-22_20-50-20-00026269.0002001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew stores an active or a SEC F-PLN as a NEW ROUTE. This message indicates that the following elements of the F-PLN are not stored: - Flight crew-entered holds - Offsets - Modifications to terminal area procedures - Flight crew-entered constraints - Pseudo waypoints - Step at optimum - Flight crew-entered Constant Mach Segment.

RTA DELETED

Ident.: DSC-22_20-50-20-00026151.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	A time constraint is automatically deleted from the active F-PLN, if one of the following occurs: - The FMGS detects an engine out condition - The aircraft enters a holding pattern - The flight crew inserts a second RTA in the same F-PLN at a different waypoint - The flight crew activates the ALTN F-PLN - The flight crew performs a DIR TO/ABEAM, and the time constrained waypoint is projected as an ABEAM point - The flight phase changes from descent or approach to climb or cruise - The UTC time is no longer valid.

RTA EXISTS

Ident.: DSC-22_20-50-20-00026275.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	I
Display Type	MCDU
Display Conditions	Before takeoff: The flight crew attempts to delete the FMS-computed ETT, while an RTA exists. In the descent phase: An RTA is already defined in the F-PLN, and the flight crew attempts to modify the managed speed in the PERF DES page.

RTA EXISTS

Ident.: DSC-22_20-50-20-00026275.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to delete the FMS-computed ETT, while an RTA exists.

RTA MISSED AT XXXXXXX

Ident.: DSC-22_20-50-20-00026276.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU and ND
Display Conditions	A waypoint is defined in the active F-PLN, and the RTA for this waypoint is predicted as not satisfied. XXXXXXX corresponds to the ident of the waypoint for which the RTA constraint will not be satisfied. In the case of an Enhanced RTA ◁ , the message is also displayed on the ND.

RWY/LS MISMATCH

Ident.: DSC-22_20-50-20-00026278.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	In the preflight or takeoff phase: The flight crew manually tunes an LS frequency in the RADIO NAV page, and this landing system disagrees with the selected takeoff runway in the F-PLN. In the climb, cruise, descent, ILS/GLS approach or go-around phase: The flight crew manually tunes an LS frequency in the RADIO NAV page, and this landing system disagrees with the selected destination runway in the F-PLN.

SELECT DESIRED SYSTEM

Ident.: DSC-22_20-50-20-00026161.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew can select a system on the displayed MCDU page.

SELECT TRUE

Ident.: DSC-22_20-50-20-00026281.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The NORTH REF pb-sw is set to MAG, while the IRS can no longer provide magnetic heading.

SET GREEN DOT SPEED

Ident.: DSC-22_20-50-20-00026283.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD

Display Conditions	All of the following conditions occur:
	- The FMGS detects an engine out condition
	- The flight crew selects a speed target which is:
	  - Equal to or above Green Dot +10 kt when ALT* or ALT are not engaged
	  - Equal to or below Green Dot -10 kt .

SET HOLD SPEED

Ident.: DSC-22_20-50-20-00026167.0008001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The selected speed/Mach control is engaged. The flight crew inserts a hold in the F-PLN, and all of the following occur: - The difference between the selected speed and the hold speed is more than 5 kt - The aircraft enters the deceleration zone.

SET HOLD SPEED

Ident.: DSC-22_20-50-20-00026167.0002001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The selected speed/Mach control is engaged. The flight crew inserts a hold in the F-PLN, and all of the following occur: - The difference between the selected speed and the hold speed is more than 5 kt - The aircraft is at 30 s or less from the deceleration zone.

SET MANAGED SPEED

Ident.: DSC-22_20-50-20-00026284.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and PFD
Display Conditions	One of the following occurs: - At the transition to the cruise phase, the speed target is selected, and the flight crew did not enter a pre-selected speed, or - At the transition to the descent phase, the speed target is selected.

SETTING SPD/RTA

Ident.: DSC-22_20-50-20-00026092.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The system updates the managed speed target to satisfy the RTA constraints. The managed speed target is frozen during the update.

SPD ERROR AT XXXXXXX

Ident.: DSC-22_20-50-20-00026174.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	In managed lateral guidance, the FMS predicts that the aircraft speed will not satisfy a speed constraint by more than 10 kt. The message disappears when the aircraft speed satisfies the speed constraint by less than 5 kt. XXXXXXX corresponds to the ident of the waypoint for which the speed constraint will not be satisfied.

SPD LIM EXCEEDED

Ident.: DSC-22_20-50-20-00026175.0008001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	All of the following occur: - The aircraft speed is more than 10 kt over the speed limit or the Green Dot speed whichever is higher - The aircraft altitude is more than 150 ft below the speed limit altitude.

SPD LIM EXCEEDED

Ident.: DSC-22_20-50-20-00026175.0002001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

Message Type	II
Display Type	MCDU
Display Conditions	All of the following occur: - The aircraft speed is more than 10 kt over the speed limit - The aircraft altitude is more than 150 ft below the speed limit altitude.

SPECIF NDB UNAVAIL

Ident.: DSC-22_20-50-20-00026176.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The NDB (defined for an NDB approach) is deselected or not available.

SPECIF VOR-D UNAVAIL

Ident.: DSC-22_20-50-20-00026177.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU and ND
Display Conditions	The VOR or VOR/DME (defined for a RNAV or VOR approach) is deselected or not available.

STEP ABOVE MAX FL

Ident.: DSC-22_20-50-20-00026178.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The entered step altitude is above the recommended maximum flight level. For information about the recommended maximum flight level, *Refer to DSC-22_20-40-30 Other Computations - Recommended Maximum Altitude (REC MAX)*.

STEP AHEAD

Ident.: DSC-22_20-50-20-00026264.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft is at less than 20 NM from the start waypoint of a step climb or a step descent.

STEP DELETED

Ident.: DSC-22_20-50-20-00026180.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS deleted or sequenced a step climb or a step descent.

STORED ROUTES FULL

Ident.: DSC-22_20-50-20-00026139.0002001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The number of routes, that are currently stored in the FMS (in the flight crew-stored routes), already reached the limit of 5 and the flight crew attempts to create a new route. The new route creation is rejected.

T/D REACHED

Ident.: DSC-22_20-50-20-00026237.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU and PFD
Display Conditions	The managed speed/Mach control is engaged, the aircraft reaches the T/D, and the FMS does not switch to the descent phase.

TAKE OFF DATA UPLINK

Ident.: DSC-22_20-50-20-00026466.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a takeoff data uplink. The flight crew can review the takeoff data and insert it in the active F-PLN via the UPLINK MAX TO DATA or the UPLINK FLX (or DRT) TO DATA pages.

TEMPORARY F-PLN EXISTS

Ident.: DSC-22_20-50-20-00026287.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	One MCDU displays a TMPY F-PLN, and the flight crew attempts one of the following: - To select any key (except the ERASE or the INSERT key), or - To activate the SEC F-PLN.

TIME ERROR AT XXXXXXX

Ident.: DSC-22_20-50-20-00026289.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	In managed lateral guidance, the FMS predicts that the aircraft speed will not satisfy a time constraint. XXXXXXX corresponds to the ident of the waypoint for which the time constraint will not be satisfied.

TIME MARKER LIST FULL

Ident.: DSC-22_20-50-20-00026185.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The F-PLN time markers already reached the limit of 4, and the flight crew attempt to insert a new time marker.

TIME TO EXIT

Ident.: DSC-22_20-50-20-00026186.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft must immediately leave the holding pattern in order to comply with the fuel reserve requirements. The fuel reserve requirements consider that the extra fuel is equal to 0 at landing at the destination airport.

TMPY UPLINK DELETED

Ident.: DSC-22_20-50-20-00026488.0005001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	An ATC F-PLN is uplinked and prefilled data that is pending insertion in the active F-PLN is deleted because any of the following conditions occur: - The flight crew displays a different page, or - A prefilled waypoint is already sequenced.

TO SPEEDS TOO LOW

Ident.: DSC-22_20-50-20-00026239.0005001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

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Message Type	II
Display Type	MCDU
Display Conditions	The flight crew inserts at least one takeoff speed (V1, VR or V2) that is below the corresponding minimum speed determined by the FMS, based on VMCG, VMCA and VS1G. Associated with an ECAM alert.

TOO STEEP PATH AHEAD

Ident.: DSC-22_20-50-20-00026290.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	In NAV mode, the FMS detects a too steep path in the vertical descent profile, in one of the following flight phases: - The cruise phase at less of 150 NM of the destination, or - The descent phase, or - The approach phase.

TUNE BBB FFF.FF

Ident.: DSC-22_20-50-20-00026191.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The flight crew manually selected a NAVAID, and the FMS cannot automatically tune the desired NAVAID. BBB corresponds to the NAVAID ident. FFF.FF corresponds to the associated frequency.

TURN AREA EXCEEDANCE

Ident.: DSC-22_20-50-20-00026292.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	In NAV mode, the aircraft is at 1.5 min before the entrance in a procedure turn leg, and the lateral path in the leg exceeds the protection envelope defined in the navigation database.

UNKNOWN PROGRAM PIN

Ident.: DSC-22_20-50-20-00026193.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The aircraft pin program combination (aircraft type, engine type, VMO/MMO parity) is not compatible or not defined in the FMGEC software. The system is then not able to initialize.

UPLINK INSERT IN PROG

Ident.: DSC-22_20-50-20-00026456.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The FMS displays this message during the insertion of a F-PLN uplink.

UPLINK INSERTED IN SEC

Ident.: DSC-22_20-50-20-00026489.0007001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	An ATC uplink message is successfully loaded in the SEC F-PLN.

UPLINK INSERTED IN TMPY

Ident.: DSC-22_20-50-20-00026490.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	An ATC uplink message is successfully loaded in a prefilled page or in the TMPY F-PLN.

USING COST INDEX-NNN

Ident.: DSC-22_20-50-20-00026194.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	I
Display Type	MCDU
Display Conditions	One of the following occurs: - The FMS uses the CI value entered during the previous flight, because for the current flight, the flight crew entered the ZFW or the GW only, and did not define the new CI previously, or - The flight crew activates the ALTN F-PLN and the current CI is not equal to 0, then the FMS sets the CI of the ACTIVE F-PLN to 0. NNN corresponds to the CI value used by the FMS.

USING COST INDEX-NNN

Ident.: DSC-22_20-50-20-00026194.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

Message Type	I
Display Type	MCDU
Display Conditions	The FMS uses the CI value entered during the previous flight, because for the current flight, the flight crew entered the ZFW or the GW only, and did not define the new CI previously. NNN corresponds to the CI value used by the FMS.

V1/VR/V2 DISAGREE

Ident.: DSC-22_20-50-20-00026196.0002001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	V1, VR, and V2 do not satisfy the condition V1 ≤ VR ≤ V2.

WAIT FOR SYSTEM RESPONSE

Ident.: DSC-22_20-50-20-00026197.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	After a system selection in the MCDU MENU Page, the system page is not immediately displayed.

WIND DATA UPLINK

Ident.: DSC-22_20-50-20-00026470.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind data uplink. The flight crew may review the wind data in the ACTIVE or the SEC F-PLN page.

WIND UPLINK EXISTS

Ident.: DSC-22_20-50-20-00026477.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts to modify the winds in the active or secondary F-PLN while a wind data uplink is pending insertion.

WIND UPLINK PENDING

Ident.: DSC-22_20-50-20-00026474.0001001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind data uplink while the DIR TO page is displayed or a TMPY F-PLN exists. The flight crew can insert the wind data after the DIR TO is performed or cancelled or after the TMPY F-PLN is inserted or cancelled.

WIND/TEMP UPLK PENDING

Ident.: DSC-22_20-50-20-00026475.0008001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Message Type	II
Display Type	MCDU
Display Conditions	The FMS receives a wind and temperature data uplink while the DIR TO page is displayed or a TMPY F-PLN exists. The flight crew can insert the wind and temperature data after the DIR TO is performed or cancelled or after the TMPY F-PLN is inserted or cancelled.

XXXX IS DESELECTED

Ident.: DSC-22_20-50-20-00026294.0001001 / 03 NOV 23
Applicable to: ALL

Message Type	I
Display Type	MCDU
Display Conditions	The flight crew attempts one of the following: - To deselect a NAVAID (via the SELECTED NAVAID page) already deselected, or - To manually tune a NAVAID (via the RADIO NAV page) already deselected. XXXX corresponds to the ident of the deselected NAVAID.

MCDU DATA FORMAT LIST

Ident.: DSC-22_20-50-30-00001244.0025001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The following chart lists all the data the flight crew may enter on the MCDU.
It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.

The following codes are used to indicate various data formats:

A : letters
N : numbers
X : letters and numbers

DATA NAME	FORMAT		UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF GO AROUND
ALT	NNNN or NNNNN (Leading zeros must be included)	MAX ALT = 41 500 Entry is rounded to the nearest 10 ft.	ft (MSL)	F-PLN A VERT REV SEC F-PLN A STEP ALTS PERF CLB PERF DES CLIMB WIND CRUISE WIND DESCENT WIND PROG INIT A SEC INIT A SEC F-PLN A
ALTN	Same as ARPT.	Same as ARPT.		INIT A
ALTN FUEL	NNN.N (Leading zeros must be included)	Same as BLOCK.		INIT FUEL PRED FUEL PRED SEC INIT FUEL PRED
ALTN RTE	Same as CO RTE.	Same as CO RTE.	N/A	INIT A
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the data base airport file New Runway page is displayed.		INIT A LAT REV ALTERNATE F-PLN A and B SEC F-PLN A and B
AIRWAYS (VIA)	XXXXX	If not in database, NOT IN DATA BASE is displayed.	N/A	AIRWAYS

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
BARO	NNNNN leading zeros may be omitted.	Min: Landing elevation or, 0 ft. Max: Landing elevation +5 000 ft.	ft (MSL) or ft (AGL) according to FCU Baro setting.	APPROACH
BLOCK FUEL	NNN.N leading zeros may be omitted.	0-250.0 thousands of kg. 0-551.2 thousands of lbs.	Thousands of kg or lbs (pin program).	INIT FUEL PRED
CABIN RATE	NNN or -NNN	100 to 900 or -999 to 100 in 1 ft/min increments	ft/min	PERF CRZ
CATEGORY	N	0-3	N/A	NEW NAVAID
CG	NN.N	8.0-50.0	% MAC	FUEL PRED
CHANNEL	NNN	500-699		NEW NAVAID RADIO NAV
CHG CODE	XXX		N/A	A/C STATUS
CLASS (NAVAID)	AAAAAA (refer to range for exact inputs allowed)	VOR DME VOR-D VORTAC LOC, ILS NDB MLS TACAN	N/A	NEW NAVAID
CO RTE	XXXXXXXXX Up to 10 alphanumeric characters may be entered.	If not in the NAV data base, a message will be displayed.	N/A	ROUTE NEW ROUTE INIT A
COST INDEX	NNN may be entered as 1-3 digits; leading zeros may be omitted.	0-999	Kg/Mn or 100 lb/h according to Lb/Kg pin program	INIT A SEC INIT A PERF CLB PERF CRZ PERF DES
CRS	NNN leading zeros may be omitted Entry of 360=0	0-360	Degrees	RADIO NAV NEW NAVAID
CRZ FL	Must be entered as flight level.	Maximum: FL 415	FL (MSL)	INIT A SEC INIT A PROG
CRZ TEMP	±NN If no sign, – assumed Leading zeros may be omitted.	±99	Degree celsius	INIT A SEC INIT A FUEL PREDICTION

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
DH	NNN "NO" may be entered.	0-700	ft	APPROACH
DIST	NN.N (leading and trailing zeros may be omitted)	0-99.9 in 1 NM increments	NM	HOLD
DIST	NNNN	0-9 999 in 1 NM increments	NM	ALTERNATE
DRT CLB	XX	D1 or D2	N/A	PERF CLIMB
DRT TO	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND	±NNN "+" may be entered as "T" or "TL" "-" may be entered as "H" or "HD" Leading zeros may be omitted. If no sign is input, "+" is taken.	0-250	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INIT A
ELV	± NNNN if + or - is not input, assume +; leading zeros may be omitted.	-2 000 to +20 470	ft (MSL)	NEW NAVAID NEW WAYPOINT
EO ACC ALT	Same as ALT.		ft (MSL)	PERF TAKEOFF GO AROUND
ETT	HHMM or HHMMSS	0-23 0-59 0-59	HOUR HH Min MM Sec SS	RTA
ETA	See GMT	See GMT	HHMM	PGPS
FIG OF MERIT	N	0-3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. To input FINAL enter NNN.N to input TIME enter/NNNN	FINAL = 0-100 Time = 0-01 h 30 with HH: 00-01 MM: 00-59	Thousands of kg or lbs (pin pgm) minutes	INIT FUEL PRED SEC INIT FUEL PRED FUEL PREDICTION
FLAPS	N	0,1, 2, or 3	N/A	TAKEOFF
FLEX TO TEMP	1. If Derated TO option not implemented: same as TEMP 2. If Derated TO option is implemented: F NN		NN in degrees centigrade	TAKEOFF

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted.	Maximum FL 415	Hundreds of ft (MSL)	F-PLN A PROG VERT REV INIT A SEC INIT A SEC F-PLN A STEP ALTS PERF CLB PERF DES CLIMB WIND CRUISE WIND DESCENT WIND
FLT NBR	XXXXXXXXXX Up to 10 alphanumeric characters may be entered.		N/A	INIT A
FREQ	NNN.NN point may be omitted if no decimal part.	108.00-117.95	MHz	PROG RADIO NAV NEW NAVAID
FREQ (ADF)	NNNN.N point may be omitted if no decimal part, leading zeroes may be omitted.	190.0-1 750.0	KHz	RADIO NAV
FROM/TO	AAAA /AAAA See ARPT	AAAA must be in database.	N/A	INIT A, SEC INIT A, ROUTE
GMT	HHMM Where HH are hours and MM are minutes Leading zeros may be omitted. 1 or 2 digit entry is interpreted as minutes.	HH: 0-23 MM: 0-59	Hours minutes	
GND TEMP	±NN (if no sign, assume +)		See TEMP	INIT A, SEC INIT A
GW	NNN.N Leading and trailing zeros may be omitted.	35.0-450.0	Thousands of kg or lbs (pin program).	FUEL PREDICTION
IDLE FACTOR	±N.N Leading and trailing zeros may be omitted.	-9.9 -+9.9	%	A/C STATUS

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	0-360	Degrees	HOLD
INCR	NN	1-20	Degrees	LAT REV
JET GW ◁	NNN.N Leading and trailing zeros may be omitted.	- 350.0	Thousands of kg or lbs (pin program).	FUEL PREDICTION
LAT	DDMM.MB or BDDMM.M DD-degrees, MM.M-minutes, B-direction. Leading zeros may be omitted but the direction (B) is necessary. Latitude is displayed as DDMM.MB.	B: N or S O, DD ≤ 90 O, MM.M, 59.9	Degree minutes tenths of minutes	INIT A
LAT crossing	DDB or BDD DD: degrees B: direction Leading zeros may be omitted but the direction (B) is necessary.	B: N or S DD: 0-90	Degrees	LAT REV
LAT/LONG	LAT/LONG Same as LAT and LONG except both must be entered with/in between.	Same as LAT and LONG.	Same as LAT and LONG.	PROG F-PLN A and B NEW WAYPOINT NEW NAVAID SEC F-PLN A and B DIR TO LAT REV NEW RUNWAY
LENGTH	NNNNN Leading zeros may be omitted.	1 000-8 000 m 3 300-26 300 ft	Meters or ft (pin program)	NEW RUNWAY

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
LONG	DDDMM.MB or BDDDMM.M DDD-degrees o MM.M-minutes B-direction. Leading zeros may be omitted but the direction (B) is necessary Longitude is displayed as DDDMM.MB	B: E or W 0 ≤ DDD ≤180 0 ≤ MM.M ≤ 59	Degrees minutes tenths of minutes	INIT A
LONG Crossing	DDDB or BDDD DDD: degrees B: direction Leading zeros may be omitted but the direction (B) is necessary.	B: E or W DDD: 0-180	Degrees	LAT REV
MACH	.NN The decimal point is necessary. Trailing zeros are not necessary.	MAX = MMO	Mach Number	PERF CRZ PERF DES
MACH for Constant Mach	Same as MACH.	0.3 MMO - ΔMMO	Same as Mach.	VERT REV
MACH/SPD	MACH and SPD must be entered with/between (See MACH and See SPD format).	Same as MACH and SPD.	Same as MACH and SPD.	PERF DES
MDA	NNNNN (leading zeros may be omitted)	Landing elevation-Landing elevation +5 000 ft	ft (MSL)	APPROACH
MDH	Same as MDA.	0-5 000	ft (AGL)	APPROACH
MIN DEST FOB	NNN.N Leading zeros may be omitted.	0-250.0	Thousands of kg or lb (pin program).	INIT FUEL PRED FUEL PRED SEC INIT FUEL PRED
NAVAID	XXXX Up to 4 alphanumeric characters may be entered.	Any alphanumeric	N/A	NAVAID NEW NAVAID NEW RUNWAY RADIO NAV SELECTED NAVAIDS
NO	NN number of LAT/LONG crossing points.	1-99	N/A	LAT REV

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
OFST	NNB or BNN NN-offset distance B-direction Leading zero on distance may be omitted. OFST will always be displayed as BNN.	B: L or R 1 < NN < 50	NM	OFFSET
PAX NBR	NNN Leading zeros may be omitted.	0-999	N/A	INIT A SEC INIT A
PLACE/BRG/DIST	PLACE: can be any data base (or pilot defined) ARPT, RWY NAVAID, or WAYPOINT entry, without decimal digit. An entry of BRG = 360 is displayed as 0. Note : True/MAG ref. TBD	PLACE-If not in data base, a message NOT IN DATA BASE is displayed - BRG: must be a 3 digits BRG = 000-360	N/A degrees	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT PROG DIR TO
	DIST: is NNN.N where leading zeros may be omitted; all 3 parameters must be entered with "/" between entries.	DIST = 0-999.9	NM	
PERF FACTOR	±N.N (leading or trailing zero may be omitted)	-9.9 to+9.9	%	A/C STATUS
PLACE-BRG/ PLACE-BRG	Same as for PLACE/BRG/DIST A PLACE-BRG couple is entered with a dash in the middle. 2 couples have to be entered with "/" between.	Same as for PLACE/BRG/DIST except for PLACE: in each of couple, PLACE is limited to 5 characters. couples	Same as for PLACE/BRG/DIST	Same as for PLACE/BRG/DIST
PLACE/DIST	PLACE: same as for PLACE/BRG/DIST DIST: same as for PLACE/BRG/DIST	PLACE: same as for PLACE/BRG/DIST DIST: -999.9 to +999.9	N/A NM	F-PLN A and B SEC F-PLN A and B WAYPOINT STORED WAYPOINT STEP ALTS
QFE	NNNN (leading or trailing zero may be omitted).	745.0-1 050.0	Hecto Pascals	UPLINK TO DATA
	NNNN (leading or trailing zeros may be omitted).	22.00-31.01	In. Hg	

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
QNH	NNNN (leading or trailing zero may be omitted).	745.0-1 100.0	Hecto Pascals	PERF APPR SEC PERF APPR
	NN.NN (leading or trailing zeros may be omitted).	22.00-32.48	In. Hg	
RADIAL IN	NNN(T) 3 digits entry with True/MAG reference.	000-360	Degrees	DIR TO
RADIAL OUT	NNN(T) 3 digits entry with True/MAG reference.	000-360	Degrees	DIR TO FIX INFO 1 and 2
RADIO	NNN or “NO”, “NO DH” or “NODH”	0-700 “NO”, “NO DH”, “NO DH”	ft	APPROACH
RADIUS	DNNN 3 digits entry D is the identifiant of the circle radius.	000-256	NM	FIX INFO 1 to 4
RTE RSV RTE RSV%	Only one may be entered at a time To input RTE RSV enter/NNN.N	RTE RSV = 0-10 000 kg	Thousands of kg or lbs (pin program).	INIT FUEL PRED FUEL PREDICTION
	To input RTE RSV % enter/NN.N	RTE RSV % = 0-15 %	%	
REQUIRED (navigation accuracy)	NN.NN (leading or trailing zeros may be omitted)	0.01-20.00	NM	PROG
RWY	AAAANND Where AAAA is same as ARPT NN is runway number (2 digits must be entered) D is L or R or C if there is more than one runway with the same number at the airport. D is not included unless there is more than one runway with the same number at AAAA.			RUNWAY NEW RUNWAY NEW NAVAID

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
RWY INTERSECTION	NNDAAA Where NN is runway number (2 digits must be entered). D is L or R or C, depending on the runway AAA are 3 alphanumerics.			UPLINK TAKEOFF DATA
SATELLITE NUMBER	NN (leading zero may be omitted)	1-99	N/A	PREDICTIVE GPS
SAT/ALT	TEMP/ALT	See TEMP and See ALT	N/A	CRUISE WIND
SET HDG	NNN.N (leading and trailing zeros may be omitted) will always be displayed as NNN.N	000.0-360.0	Degrees	IRS MONITOR
SLOPE	N.N	0.0-9.0	Degrees	NEW NAVAID
STATION DEC	NNND Where NNN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination "TO" or "OT" for a true referenced VOR station if polar navigation option is activated.	NN: 00-180 D: E or W	Degrees	NEW NAVAID
STEP ALT	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted.	Same as Flight Level or ALT.	Same as Flight Level or ALT.	F-PLN A SEC F-PLN A STEP ALTS pages SEC STEP ALTS pages
SPD	NNN (must be 3 numerics)	MAX VMO MIN = 90 kt	kt (CAS)	F-PLN A SEC F-PLN A VERT REV PERF CLB PERF CRZ PERF DES

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
SPD LIM	SSS/NNNNN SSS is a speed NNNNNN is an ALT or FLIGHT LEVEL (See ALT and See FLIGHT LEVEL)	SSS same as SPD.	kt/ft (MSL) or kt/FL	VERT REV F-PLN A
SPD/MACH	See MACH/SPD	Same as MACH and SPD.	Same as MACH and SPD.	PERF DES
TAXI	N.N Leading or trailing zeros may be omitted.	0-9.9	Thousands of kg or lbs (pin program).	INIT FUEL PRED
TEMP	±NN If no sign, assume + Leading zeros may be omitted.		Degrees centigrade	PERF TAKEOFF PERF APPR UPLINK TO DATA REQ
THR RED ALT	Same as ALT.	400 ft AGL mini	ft (MSL)	TAKEOFF GO AROUND
THS	AAN.N or N.NAA where AA is UP or DN. Trailing zeros may be omitted.	MAX UP = 9.9 MAX DN = 5.0 MIN UP and DN is 0.0 the increment value is 0.1	Degrees	TAKEOFF
TIME	N.N	0-9.9	Minutes	HOLD
TIME MARK	See GMT	See GMT	Hours Minutes	F-PLN A and B
TO LIMIT	NNNNN	1-Length of origin runway.	m or ft (pin program)	UPLINK TO DATA REQ
T.O. SHIFT	NNNNN	1-Length of origin runway.	m or ft (pin program)	TAKEOFF
TRANS ALT	Same as ALT.		ft (MSL)	TAKEOFF APPROACH
TRANS FL	See FLIGHT LEVEL			
TRIP WIND	See EFF WIND		kts	INIT FUEL PRED SEC INIT FUEL PRED
TROPO	An entry of NNNN or NNNNN is considered as an altitude. An entry of NNN or NN is considered as a FLIGHT LEVEL.	ALT:1 000-99 990 (Altitude entry is rounded to the nearest 10 ft) FL: 10-999	Same as ALT or FLIGHT LEVEL.	FUEL PREDICTION INIT A SEC INIT A
UPDATE AT	Same as WAYPOINT.	Same as WAYPOINT.	N/A	PROG
V1	Same as SPD.		kt (CAS)	TAKEOFF
V2	Same as SPD.		kt (CAS)	TAKEOFF

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
VR	Same as SPD.		kt (CAS)	TAKEOFF
VAPP	Same as SPD.		kt (CAS)	APPROACH
WAYPOINT	XXXXXXXX-may be from 1-7 characters for waypoint. Acceptable as waypoint Ident: SEC ARPT NAVAID WAYPOINT LAT/LONG PLACE.BRG/ PLACE.BRG PLACE.BRG/DIST PLACE/DIST may be entered to define a waypoint.			WAYPOINT NEW WAYPOINT F-PLN A and B SEC F-PLN A and B LAT REV PROG DIR TO FIX INFO 1 and 2 EQUI-TIME POINT STEP ALTS PREDICTIVE GPS VERT REV
WIND DIR/ WIND MAG	NNN/NNN Both must be entered; leading zeros may be omitted.	WIND DIR: 0-360	Degrees	PERF APPR CLIMB WIND CRUISE WIND DESCENT WIND EQUI-TIME POINT
	An entry of WIND DIR = 360 is displayed as 0.	WIND MAG: 0-250	Kt	
WIND DIR/ WIND/MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN NNN	WIND DIR 0-360	Degrees	CLIMB WIND CRUISE WIND DESCENT WIND
	NNN-leading zero not necessary. An entry of Wind DIR = 360 is displayed as 0. ALT or FLIGHT LEVEL or "GRND"	WIND MAG 0-250 same as ALT and FL except that range min = 0	/kt /ft MSL or/Hundreds of the (MSL)	
ZFW	NNN.N Leading and trailing zeros may be omitted.	MIN ZFW (1)- MAX ZFW (1)	Thousands of kg or Lbs.	INIT FUEL PRED FUEL PRED
ZFWCG	Same as CG.	Same as CG.	Same as CG.	INIT FUEL PRED FUEL PRED

(1) *As defined in the Performance Data Base*

MCDU DATA FORMAT LIST

Ident.: DSC-22_20-50-30-00001244.0017001 / 21 MAR 17
Applicable to: LV-KHT, LV-KHU

The following chart lists all the data the pilot may enter on the MCDU.
It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.

The following codes are used to indicate various data formats:

A : letters
N : numbers
X : letters and numbers

DATA NAME	FORMAT		UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF GO AROUND
ALT	NNNN or NNNNN (Leading zeros must be included)	MAX ALT = 41 500 Entry is rounded to the nearest 10 ft	ft (MSL)	F-PLN A VERT REV SEC F-PLN A STEP ALTS PERF CLB PERF DES CLIMB WIND CRUISE WIND DESCENT WIND PROG INIT A SEC INIT A SEC F-PLN A
ALTN	Same as ARPT	Same as ARPT		INIT A
ALTN FUEL	NNN.N (Leading zeros must be included)	Same as BLOCK		INIT B FUEL PRED SEC INIT B
ALTN RTE	Same as CO RTE	Same as CO RTE	N/A	INIT A
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the data base airport file New Runway page is displayed		INIT A LAT REV ALTN F-PLN A and B SEC F-PLN A and B
AIRWAYS (VIA)	XXXXX	If not in data base, "NOT IN DATA BASE" is displayed	N/A	AIRWAYS

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
BARO	NNNNN leading zeros may be omitted	Min: Landing elevation or, 0ft Max: Landing elevation +5000 ft	ft (MSL) or ft (AGL) according to FCU Baro setting	APPROACH
BLOCK FUEL	NNN.N leading zeros may be omitted.	0-250.0 thousands of kg 0-551,2 thousands of lbs	Thousands of Kg or lbs (pin program)	INIT B
CABIN RATE	NNN or -NNN	100 to 900 or -999 to 100 in 1 ft/min increments	ft/min	PERF CRZ
CATEGORY	N	0-3	N/A	NEW NAVAID
CG	NN.N	8.0-50.0	% MAC	FUEL PRED
CHANNEL	NNN	500-699		NEW NAVAID RAD NAV
CHG CODE	XXX		N/A	A/C STATUS
CLASS (NAVAID)	AAAAAA (refer to range for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB MLS TACAN	N/A	NEW NAVAID
CO RTE	XXXXXXXXX Up to 10 alphanumeric characters may be entered	If not in the NAV data base, a message will be displayed	N/A	ROUTE NEW ROUTE INIT A
COST INDEX	NNN may be entered as 1-3 digits; leading zeros may be omitted	0-999	Kg/Mn or 100 lb/h according to Lb/Kg pin program	INIT A SEC INIT A PERF CLB PERF CRZ PERF DES
CRS	NNN leading zeros may be omitted Entry of 360=0	0-360	Degrees	RADIO NAV NEW NAVAID
CRZ FL	Must be entered as flight level	Maximum: FL 415	FL (MSL)	INIT A SEC INIT A PROG
CRZ TEMP	±NN If no sign, – assumed Leading zeros may be omitted	±99	Degree celsius	INIT A SEC INIT A FUEL PREDICTION

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
DH	NNN "NO" may be entered	0-700	ft	APPROACH
DIST	NN.N (leading and trailing zeros may be omitted)	0-99.9 in 1 NM increments	NM	HOLD
DIST	NNNN	0-9 999 in 1 NM increments	NM	ALTN
DRT CLB	XX	D1 or D2	N/A	PERF CLIMB
DRT TO	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND	±NNN "+" may be entered as "T" or "TL" “-" may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0-250	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INIT A
ELV	± NNNN if + or - is not input, assume +; leading zeros may be omitted	-2 000 to +20 470	ft (MSL)	NEW NAVAID NEW WAYPOINT
EO ACC ALT	Same as ALT		ft (MSL)	PERF TAKEOFF GO AROUND
ETT	HHMM or HHMMSS	0-23 0-59 0-59	HOUR HH Min MM Sec SS	RTA
ETA	See GMT	See GMT	HHMM	PGPS
FIG OF MERIT	N	0-3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. To input FINAL enter NNN.N to input TIME enter/NNNN	FINAL = 0-100 Time = 0-01 h 30 with HH: 00-01 MM: 00-59	Thousands of kg or Lbs (pin pgm) minutes	INIT B SEC INIT B FUEL PREDICTION
FLAPS	N	0,1, 2, or 3	N/A	TAKEOFF
FLEX TO TEMP	1. If Derated TO option not implemented: same as TEMP 2. If Derated TO option is implemented: F NN		NN in degrees centigrade	TAKEOFF

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Maximum FL 415	Hundreds of ft (MSL)	F-PLN A PROG VERT REV INIT A SEC INIT A SEC F-PLN A STEP ALTS PERF CLB PERF DES CLIMB WIND CRUISE WIND DESCENT WIND
FLT NBR	XXXXXXXXXX Up to 10 alphanumeric characters may be entered		N/A	INIT A
FREQ	NNN.NN point may be omitted if no decimal part.	108.00-117.95	MHz	PROG RADIO NAV NEW NAVAID
FREQ (ADF)	NNNN.N point may be omitted if no decimal part, leading zeroes may be omitted.	190.0-1 750.0	KHz	RADIO NAV
FROM/TO	AAAA /AAAA See ARPT	AAAA must be in data base	N/A	INIT A, SEC INIT A, ROUTE
GMT	HHMM Where HH are hours and MM are minutes Leading zeros may be omitted. 1 or 2 digit entry is interpreted as minutes.	HH: 0-23 MM: 0-59	Hours minutes	
GND TEMP	±NN (if no sign, assume +)		See TEMP	INIT A, SEC INIT A
GW	NNN.N Leading and trailing zeros may be omitted	35.0-450.0	Thousands of kg or Lbs (pin program)	FUEL PREDICTION
IDLE FACTOR	±N.N Leading and trailing zeros may be omitted	-9.9 -+9.9	%	A/C STATUS

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	0-360	Degrees	HOLD
INCR	NN	1-20	Degrees	LAT REV
JET GW	NNN.N Leading and trailing zeros may be omitted	- 350.0	Thousands of kg or Lbs (pin program)	FUEL PREDICTION
LAT	DDMM.MB or BDDMM.M DD-degrees, MM.M-minutes, B-direction. Leading zeros may be omitted but the direction (B) is necessary. Latitude is displayed as DDMM.MB	B: N or S O, DD ≤ 90 O, MM.M, 59.9	Degree minutes tenths of minutes	INIT A
LAT crossing	DDB or BDD DD: degrees B: direction Leading zeros may be omitted but the direction (B) is necessary	B: N or S DD: 0-90	Degrees	LAT REV
LAT/LONG	LAT/LONG Same as LAT and LONG except both must be entered with/in between	Same as LAT and LONG	Same as LAT and LONG	PROG F-PLN A and B NEW WAYPOINT NEW NAVAID SEC F-PLN A and B DIR TO LAT REV NEW RUNWAY
LENGTH	NNNNN Leading zeros may be omitted	1 000-8 000 m 3 300-26 300 ft	Meters or ft (pin program)	NEW RUNWAY

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
LONG	DDDMM.MB or BDDDMM.M DDD-degrees o MM.M-minutes B-direction. Leading zeros may be omitted but the direction (B) is necessary Longitude is displayed as DDDMM.MB	B: E or W 0 ≤ DDD ≤180 0 ≤ MM.M ≤ 59	Degrees minutes tenths of minutes	INIT A
LONG Crossing	DDDB or BDDD DDD: degrees B: direction Leading zeros may be omitted but the direction (B) is necessary	B: E or W DDD: 0-180	Degrees	LAT REV
MACH	.NN The decimal point is necessary. Trailing zeros are not necessary.	MAX = MMO	Mach Number	PERF CRZ PERF DES
MACH for Constant Mach	Same as MACH	0.3 MMO - ΔMMO	Same as Mach	VERT REV
MACH/SPD	MACH and SPD must be entered with/between (See MACH and See SPD format)	Same as MACH and SPD	Same as MACH and SPD	PERF DES
MDA	NNNNN (leading zeros may be omitted)	Landing elevation-Landing elevation +5 000 ft	ft (MSL)	APPROACH
MDH	Same as MDA	0-5 000	ft (AGL)	APPROACH
MIN DEST FOB	NNN.N Leading zeros may be omitted	0-250.0	Thousands of kg or lb. (pin program)	INIT B FUEL PRED SEC INIT B
NAVAID	XXXX Up to 4 alphanumeric characters may be entered	Any alphanumeric	N/A	NAVAID NEW NAVAID NEW RUNWAY RADIO NAV SELECTED NAVAID
NO	NN number of LLXING	1-99		LAT REV

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
OFST	NNB or BNN NN-offset distance B-direction Leading zero on distance any be omitted. OFST will always be displayed as BNN	B: L or R 1 < NN < 50	NM	OFFSET
PAX NBR	NNN Leading zeros may be omitted	0-999	N/A	INIT A SEC INIT A
PLACE/BRG/DIST	PLACE: can be any data base (or pilot defined) ARPT, RWY NAVAID, or WAYPOINT entry, without decimal digit. An entry of BRG = 360 is displayed as 0. Note : True/MAG ref. TBD	PLACE-If not in data base, a message "NOT IN DATA BASE" is displayed - BRG : must be a 3 digits BRG = 000-360	N/A degrees	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT PROG DIR TO
	DIST: is NNN.N where leading zeros may be omitted; all 3 parameters must be entered with "/" between entries	DIST = 0-999.9	NM	
PERF FACTOR	±N.N (leading or trailing zero may be omitted)	-9.9 -+9.9	%	A/C STATUS
PLACE-BRG/ PLACE-BRG	Same as for PLACE/BRG/DIST A PLACE-BRG couple is entered with a dash in the middle. 2 couples have to be entered with "/" between	Same as for PLACE/BRG/DIST except for PLACE: in each of couple, PLACE is limited to 5 characters. couples	Same as for PLACE/BRG/DIST	Same as for PLACE/BRG/DIST
PLACE/DIST	PLACE: same as for PLACE/BRG/DIST DIST: same as for PLACE/BRG/DIST	PLACE: same as for PLACE/BRG/DIST DIST: -999.9 to +999.9	N/A NM	F-PLN A and B SEC F-PLN A and B WPT PILOT WPT STEP ALTS
QFE	NNNN (leading or trailing zero may be omitted).	745.0-1 050.0	Hecto Pascals	UPLINK TO DATA
	NNNN (leading or trailing zeros may be omitted).	22.00-31.01	In. Hg	

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
QNH	NNNN (leading or trailing zero may be omitted).	745.0-1 100.0	Hecto Pascals	APPROACH SEC APPROACH
	NN.NN (leading or trailing zeros may be omitted).	22.00-32.48	In. Hg	
RADIAL IN	NNN(T) 3 digits entry with True/MAG reference.	000-360	Degrees	DIR TO
RADIAL OUT	NNN(T) 3 digits entry with True/MAG reference.	000-360	Degrees	DIR TO FIX INFO 1 and 2
RADIO	NNN or “NO”, “NO DH” or “NODH”	0-700 “NO”, “NO DH”, “NO DH”	ft	APPROACH
RADIUS	DNNN 3 digits entry D is the identifiant of the circle radius	000-256	NM	FIX INFO 1 to 4
RTE RSV RTE RSV%	Only one may be entered at a time To input RTE RSV enter/NNN.N	RTE RSV = 0-10 000 kg	Thousands of KG or Lbs (pin pgm)	INIT B FUEL PREDICTION
	To input RTE RSV % enter/NN.N	RTE RSV % = 0-15 %	%	
REQUIRED (navigation accuracy)	NN.NN (leading or trailing zeros may be omitted)	0.01-20.00	NM	PROG
RWY	AAAANND Where AAAA is same as ARPT NN is runway number (2 digits must be entered) D is L or R or C if there is more than one runway with the same number at the airport. D is not included unless there is more than one runway with the same number at AAAA.			RUNWAY NEW RUNWAY NEW NAVAID

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
RWY INTERSECTION	NNDAAA Where NN is runway number (2 digits must be entered). D is L or R or C, depending on the runway AAA are 3 alphanumerics.			UPLINK TAKEOFF DATA
SATELLITE NUMBER	NN (leading zero may be omitted)	1-99	N/A	PREDICTIVE GPS
SAT/ALT	TEMP/ALT	See TEMP andSee ALT	N/A	CRUISE WIND
SET HDG	NNN.N (leading and trailing zeros may be omitted) will always be displayed as NNN.N	000.0-360.0	Degrees	IRS MONITOR
SLOPE	N.N	0.0-9.0	Degrees	NEW NAVAID
STATION DEC	NNND Where NNN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination "TO" or "OT" for a true referenced VOR station if Polar Navigation option is activated	NN: 00-180 D: E or W	Degrees	NEW NAVAID
STEP ALT	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	Same as Flight Level or ALT	Same as Flight Level or ALT	F-PLN A SEC F-PLN A STEP ALTS pages SEC STEP ALTS pages
SPD	NNN (must be 3 numerics)	MAX VMO MIN = 90 kt	kt (CAS)	F-PLN A SEC F-PLN A VERT REV PERF CLB PERF CRZ PERF DES

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
SPD LIM	SSS/NNNNN SSS is a speed NNNNNN is an ALT or FLIGHT LEVEL (See ALT and See FLIGHT LEVEL)	SSS same as SPD	kt/ft (MSL) or kt/FL	VERT REV F-PLN A
SPD/MACH	See SPD/MACH	Same as MACH and SPD	Same as MACH and SPD	PERF DES
TAXI	N.N Leading or trailing zeros may be omitted	0-9.9	Thousands of kg or Lbs (pin program)	INIT B
TEMP	±NN If no sign, assume + Leading zeros may be omitted		Degrees centigrade	PERF TAKEOFF PERF APPR UPLINK TO DATA REQ
THR RED ALT	Same as ALT	400 ft AGL mini	ft (MSL)	TAKEOFF GO AROUND
THS	AAN.N or N.NAA where AA is UP or DN (DOWN) Trailing zeros may be omitted	MAX UP = 9.9 MAX DN = 5.0 MIN UP and DN is 0.0 the increment value is 0.1	Degrees	TAKEOFF
TIME	N.N	0-9.9	Minutes	HOLD
TIME MARK.	See GMT	See GMT	Hours Minutes	F-PLN A and B
TO LIMIT	NNNNN	1-Length of origin runway	m or ft (pin program)	UPLINK TO DATA REQ
T.O. SHIFT	NNNNN	1-Length of origin runway	m or ft (pin program)	TAKEOFF
TRANS ALT	Same as ALT		ft (MSL)	TAKEOFF APPROACH
TRANS FL	See FLIGHT LEVEL			
TRIP WIND	See EFF WIND		kts	INIT B SEC INIT B
TROPO	An entry of NNNN or NNNNN is considered as an altitude. An entry of NNN or NN is considered as a FLIGHT LEVEL	ALT:1 000-99 990 (Altitude entry is rounded to the nearest 10 ft) FL: 10-999	Same as ALT or FLIGHT LEVEL	FUEL PREDICTION INIT A SEC INIT A
UPDATE AT	Same as WAYPOINT	Same as waypoint	N/A	PROG
V1	Same as SPD		kt (CAS)	TAKEOFF
V2	Same as SPD		kt (CAS)	TAKEOFF

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DATA NAME	FORMAT		UNITS	DISPLAY PAGE
VR	Same as SPD		kt (CAS)	TAKEOFF
VAPP	Same as SPD		kt (CAS)	APPROACH
WAYPOINT	XXXXXXXX-may be from 1-7 characters for waypoint. Acceptable as waypoint Ident: SEC ARPT NAVAID WAYPOINT LAT/LONG, PLACE.BRG/ PLACE.BRG PLACE.BRG/DIST PLACE/DIST may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F-PLN A and B SEC F-PLN A and B LAT REV PROG DIR TO FIX INFO 1 and 2 EQUI TIME PT STEP ALTS PREDICTIVE GPS VERT REV
WIND DIR/ WIND MAG	NNN/NNN Both must be entered; leading zeros may be omitted.	WIND DIR: 0-360	Degrees	PERF APPR CLIMB WIND CRUISE WIND DESCENT WIND EQUI TIME PT
	An entry of WIND DIR = 360 is displayed as 0.	WIND MAG: 0-250	Kt	
WIND DIR/ WIND/MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN NNN	WIND DIR 0-360	Degrees	CLIMB WIND CRUISE WIND DESCENT WIND
	NNN-leading zero not necessary. An entry of Wind DIR = 360 is displayed as 0. ALT or FLIGHT LEVEL or "GRND"	WIND MAG 0-250 same as ALT and FL except that range min = 0	/kt /ft MSL or/Hundreds of the (MSL)	
ZFW	NNN.N Leading and trailing zeros may be omitted	Min ZFW (1)- Max ZFW (1)	Thousands of kg or Lbs	INIT B FUEL PRED
ZFWCG	Same as CG	Same as CG	Same as CG	INIT B FUEL PRED

(1) *As defined in the Performance Data Base*

MCDU DATA FORMAT LIST

Ident.: DSC-22_20-50-30-00001244.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

The following chart lists all the data the pilot may enter on the MCDU.
It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.

The following codes are used to indicate various data formats:

A : letters
N : numbers
X : letters and numbers

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF GO AROUND
ALT	NNNN or NNNNN (Leading zeros must be included)	MAX ALT = 41 000 Entry is rounded to the nearest 10 ft	ft (MSL)	F-PLN A VERT REV SEC F-PLN A STEP ALTS PERF CLB PERF DES CLIMB WIND CRUISE WIND DESCENT WIND PROG INIT A SEC INIT A SEC F-PLN A
ALTN	Same as ARPT	Same as ARPT		INIT A
ALTN RTE	Same as CO RTE	Same as CO RTE	N/A	INIT A
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the data base airport file New Runway page is displayed		INIT A LAT REV ALTN F-PLN A and B SEC F-PLN A and B WAYPOINT DIR TO PROG
AIRWAYS (VIA)	XXXXX	If not in data base, "NOT IN DATA BASE" is displayed	N/A	AIRWAYS

Continued on the following page

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
BLOCK FUEL	NNN.N leading zeros may be omitted.	0-150.0 thousands of kg 0-330,7 thousands of lbs	Thousands of Kg or lbs (pin program)	INIT B
CABIN RATE	NNN	100-999 in 1 ft/min increments	ft/min	PERF CRZ
CG	NN.N	8.0-50.0	% MAC	FUEL PRED
CHANNEL	NNN	500-699		NEW NAVAID RAD NAV
CLASS (NAVAID)	AAAAAA (refer to range for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB MLS TACAN	N/A	NEW NAVAID
CO RTE	XXXXXXXXX Up to 10 alphanumeric characters may be entered	If not in the NAV data base, a message will be displayed	N/A	ROUTE NEW ROUTE INIT A
COST INDEX	NNN may be entered as 1-3 digits; leading zeros may be omitted	0-999	Kg/Mn or 100 lb/h according to Lb/Kg pin program	INIT A PERF CLB PERF CRZ PERF DES
CRS	NNN leading zeros may be omitted Entry of 360 = 0	0-360	Degrees	RADIO NAV NEW NAVAID
CRZ FL	Must be entered as flight level	Maximum: FL 450	FL (MSL)	INIT A SEC INIT A PROG
CRZ TEMP	See TEMP		See TEMP	INIT A FUEL PREDICTION SEC INIT A
DH	NNN "NO" may be entered	0-700	ft	APPROACH
DIST	NN.N (leading and trailing zeros may be omitted)	0-99.9 in 1 NM increments	NM	HOLD

Continued on the following page

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
DIST	NNNN	0-9 999 in 1 NM increments	NM	ALTN
DRT TO	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND	± NNN "+" may be entered as "T" or "TL" "-" may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0-500	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INIT A
ELV	± NNNN if + or - is not input, assume +; leading zeros may be omitted	-1 000-+20 470	ft (MSL)	NEW NAVAID (NAVAID) NEW WAYPOINT
EO ACC ALT	Same as ALT		ft (MSL)	PERF TAKEOFF/ GO AROUND
ETT	Estimated takeoff time same as UTC/TIME	0000-9959	HOUR: (2 first N) MIN: (2 last N)	VERT REV F-PLN
ETT/RTA	HH:MM:SS	00:00:00 to 23:59:59	Hour HH Min MM Sec SS	RTA
EXTRA/TIME	± NNN.N/NNNN	± MAX. Block/GMT		INIT B SEC INIT B FUEL PRED
FIG OF MERIT	N	0-3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. To input FINAL enter NNN.N to input TIME enter/NNNN	FINAL = 0-100 Time = 0-90 min	Thousands of kg or Lbs (pin pgm) minutes	INIT B FUEL PREDICTION SEC INIT B
FLAPS	N	0,1, 2, or 3		TAKEOFF

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
FLEX TO TEMP	1. If same as TEMP Derated TO option not implemented 2. If F NN Derated TO option is implemented		NN in degrees centigrade	TAKEOFF
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Maximum FL 450	Hundreds of ft (MSL)	F-PLN A PROG VERT REV INIT A SEC INIT A SEC F-PLN A STEP ALTS PERF CLB PERF DES CLIMB WIND CRUISE WIND DESCENT WIND
FLT NBR	XXXXXXXXXX Up to 10 alphanumeric characters may be entered			INIT A
FREQ	NNN.NN point may be omitted if no decimal part.	108.00-117.95	MHz	PROG RADIO NAV NEW NAVAID
FREQ (ADF)	NNNN.N point may be omitted if no decimal part, leading zeroes may be omitted.	190.0-1 750.0	KHz	RADIO NAV
FROM/TO	AAAA /AAAA See ARPT	AAAA must be in data base	N/A	INIT A

Continued on the following page

Continued from the previous page

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
GMT	HHMM Where HH are hours and MM are minutes Leading zeros may be omitted. 1 or 2 digit entry is interpreted as minutes.	HH : 0-23 MM : 0-59	Hours minutes	VERT REV
GW	NNN.N Leading and trailing zeros may be omitted	35.0-350.0	Thousands of kg or Lbs (pin program)	FUEL PREDICTION
IDLE FACTOR	±N.N Leading and trailing zeros may be omitted	-9.9-+9.9	%	A/C STATUS
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	0-360	Degrees	HOLD
INCR	NN	1-20	Degrees	LAT REV
JET GW	NNN.N Leading and trailing zeros may be omitted	- 350.0	Thousands of kg or Lbs (pin program)	FUEL PREDICTION
LAT	DDMM.MB or BDDMM.M DD-degrees, MM.M-minutes, B-direction. Leading zeros may be omitted but the direction (B) is necessary. Latitude is displayed as DDMM.MB	B : N or S O, DD ≤ 90 O, MM.M, 59.9	Degree minutes tenths of minutes	INIT A
LAT/LONG	LAT/LONG Same as LAT and LONG except both must be entered with/in between	Same as LAT and LONG	Same as LAT and LONG	PROG F-PLN A and B NEW WAYPOINT NEW NAVAID SEC F-PLN A and B DIR TO LAT REV NEW RUNWAY
LENGTH	NNNNN Leading zeros may be omitted	1 000-8 000 m 3 282-26 347 ft	Meters or ft (pin program)	NEW RUNWAY

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
LONG	DDDMM.MB or BDDDMM.M DDD-degrees o MM.M-minutes B-direction. Leading zeros may be omitted but the direction (B) is necessary Longitude is displayed as DDDMM.MB	B : E or W 0 ≤ DDD ≤180 0 ≤ MM.M ≤ 59	Degrees minutes tenths of minutes	INIT A
MACH	.NN The decimal point is necessary. Trailing zeros are not necessary	MAX = MMO	Mach Number	PERF CLB PERF CRZ PERF DES
MACH/SPD	MACH and SPD must be entered with/between (See MACH and See SPD format)	Same as MACH and SPD	Same as MACH and SPD	PERF DES PERF CLB
MDA	NNNNN (leading zeros may be omitted)	Landing elevation-Landing elevation +5 000 ft	ft (MSL)	APPROACH
MDH	±NNNNN	0-5 000	ft (AGL)	APPROACH
NAVAID	XXXX Up to 4 alphanumeric characters may be entered	Any alphanumeric	N/A	PROG NEW NAVAID NAVAID F-PLN A and B LAT REV SEC F-PLN A and B DIR TO RADIO NAV SELECTED NAVAID
NO	NN number of LLXING	1-99		LAT REV
OFST	NNB or BNN NN-offset distance B-direction Leading zero on distance any be omitted. OFST will always be displayed as BNN	B : L or R 1 < NN < 50	NM	LAT REV

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
PLACE/BRG/DIST	PLACE : can be any data base (or pilot defined) ARPT, RWY NAVAID, or WAYPOINT entry, without decimal digit. An entry of BRG = 360 is displayed as 0. Note : True/MAG ref. TBD	PLACE-If not in data base, a message "NOT IN DATA BASE" is displayed - BRG: must be a 3 digits BRG = 000-360	N/A degrees	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT PROG DIR TO STEP ALTS
	DIST : is NNN.N where leading zeros may be omitted; all 3 parameters must be entered with "/" between entries	DIST = 0-999.9	NM	
PERF FACTOR	±N.N (leading or trailing zero may be omitted)	-9.9-+9.9	%	A/C STATUS
PLACE-BRG/PLACE-BRG	Same as for PLACE/BRG/DIST A PLACE-BRG couple is entered with a dash in the middle. 2 couples have to be entered with "/" between	Same as for PLACE/BRG/DIST except for PLACE : in each of couple, PLACE is limited to 5 characters. couples	Same as for PLACE/BRG/DIST	Same as for PLACE/BRG/DIST
PLACE/DIST	PLACE : same as for PLACE/BRG/DIST DIST : same as for PLACE/BRG/DIST	PLACE : same as for PLACE/BRG/DIST DIST : 0-999.9	N/A NM	F-PLN A and B SEC F-PLN A and B LAT REV NEW WAYPOINT DIR TO STEP ALTS
QNH	NNNN (leading or trailing zero may be omitted).	745.0-1 050.0	Hecto Pascals	APPROACH VERT REV
	NN.NN (leading or trailing zeros may be omitted).	22.00-31.00	In. Hg	
RADIAL IN	NNN(T) 3 digits entry with True/Mag reference.	000-360	Degrees	DIR TO
RADIAL OUT	NNN(T) 3 digits entry with True/Mag reference	000-360	Degrees	DIR TO FIX INFO 1 and 2

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
RTE RSV RTE RSV %	Only one may be entered at a time To input RTE RSV enter/NNN.N To input RTE RSV enter/NN.N	RTE RSV = 0-25 600 kg RTE RSV % = 0- 15 %	Thousands of KG or Lbs (pin pgm) %	INIT B FUEL PREDICTION
REQUIRED (navigation accuracy)	NN.NN (leading or trailing zeros may be omitted)	0.01-200	NM	PROG
RWY	AAAANND Where AAAA is same as ARPT NN is runway number (2 digits must be entered) D is L or R or C if there is more than one runway with the same number at the airport. D is not included unless there is more than one runway with the same number at AAAA.			RUNWAY NEW RUNWAY
SATELLITE NUMBER	NN (leading zero may be omitted)	1-99	N/A	PREDICTIVE GPS
SAT/ALT	TEMP/ALT	See TEMP and See ALT	N/A	CRUISE WIND
SET HDG	NNN/N (leading and trailing zeros may be omitted) will always be displayed as NNN/N	000.0-360.0	Degrees	IRS MONITOR
SLOPE	NN.N	00.0-90.0	Degrees	NEW NAVAID
STATION DEC	NNND Where NNN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination	NN : 00-180 D : E or W	Degrees	NEW NAVAID

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
STEP ALT	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	Same as Flight Level or ALT	Same as Flight Level or ALT	F-PLN A
SPD	NNN (must be 3 numerics)	MAX VMO MIN = 100 kt	kt (CAS)	F-PLN A SEC F.PLN A VERT REV PERF CLB PERF CRZ PERF DES
SPD LIM	SSS/NNNNN SSS is a speed NNNNNN is an ALT or FLIGHT LEVEL (See ALT and See FLIGHT LEVEL)	SSS same as SPD	kt/ft (MSL) or kt/FL	VERT REV
SPD/MACH	See MACH/SPD	Same as MACH and SPD	Same as MACH and SPD	PERF CLB PERF DES
TAXI	N.N Leading or trailing zeros may be omitted	0-9.9	Thousands of kg or Lbs	INIT B
TEMP	±NN If no sign, assume +		Degrees centigrade	APPROACH
THR RED ALT	Same as ALT	400 ft AGL mini	ft (MSL)	TAKEOFF GO AROUND
THS	AAN.N or N.NAA where AA is UP or DN (DOWN)	MAX UP = 7.0 MAX DN = 5.0 MIN UP and DN is 0.0 the increment value is 0.1	Degrees	TAKEOFF
TIME	N.N	0-9.9	Minutes	HOLD
TIME MARK.	See GMT	See GMT	Hours Minutes	F-PLN A and B
T.O. SHIFT	NNNNN	1-Length of origin runway	m or ft	TAKEOFF
TRANS ALT	Same as ALT	400 ft AGL MIN	ft (MSL)	TAKEOFF APPROACH
TRIP WIND	See EFF WIND		kts	INIT A SEC INIT A
TROPO	Same as ALT	Same as ALT	ft	FUEL PREDICTION

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DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
UPDATE AT	Same as WAYPOINT	Same as WAYPOINT	N/A	PROG
UTC/TIME	NNN	0000-9 959	Hour (2 first N) Min. (2 last N)	HOLD VERT REV PREDICTIVE GPS
V1	Same as SPD		kt (CAS)	TAKEOFF
V2	Same as SPD		kt (CAS)	TAKEOFF
VR	Same as SPD		kt (CAS)	TAKEOFF
VAPP	Same as SPD		kt (CAS)	APPROACH
WAYPOINT	XXXXXXXX - may be from 1-7 characters for waypoint. Acceptable as waypoint Ident: SEC ARPT NAVAID WAYPOINT LAT/LONG, PLACE.BRG/ PLACE.BRG PLACE.BRG/DIST PLACE/DIST may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F-PLN A and B F-PLN A and B LAT REV PROG DIR TO FIX INFO 1 and 2 EQUI TIME PT STEP ALTS PREDICTIVE GPS
WIND DIR/ WIND MAG	NNN/NNN Both must be entered; leading zeros may be omitted.	WIND DIR : 0-360	Degrees	PERF APPR CLIMB WIND CRUISE WIND DESCENT WIND
	An entry of WIND DIR = 360 is displayed as 0.	WIND MAG : 0-500	Kt	
WIND DIR/ WIND MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN NNN-Leading zero not necessary. An entry of Wind DIR = 360 is displayed as 0.	WIND DIR 0-360 WIND MAG 0-200 same as ALT	Degrees /kt /ft MSL	CLIMB WIND CRUISE WIND DESCENT WIND
ZFW	NNN.N Leading and trailing zeros may be omitted	35-350.0	Thousands of kg or Lbs	INIT B
ZFWCG	Same as CG	Same as CG	Same as CG	INIT B

MEMO DISPLAY

Ident.: DSC-22_20-50-40-00017161.0008001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

DEST EFOB : This memo appears in amber, when DEST EFOB value is lower than MIN DEST FOB value. This memo is cleared, when DEST EFOB value is greater than MIN DEST FOB value + 200 kg (+ 440 lb).

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GENERAL

Ident.: DSC-22_20-60-10-00001306.0001001 / 10 DEC 09
Applicable to: ALL

The baro reference selector of the EIS (Electronic Instrument System) allows the pilot to use the standard barometric reference (STD), sea level atmospheric pressure (QNH), or atmospheric pressure at airfield elevation (QFE option) for the barometer setting.
The selected value is displayed in the baro reference display window of the EFIS control panel and on the Primary Flight Display (PFD) below the altitude scale.
The barometer setting is used as a reference for the altimeter of the PFD and for the PFD target altitude. In flight, it affects the predicted altitudes on the MCDU and the descent path computation.

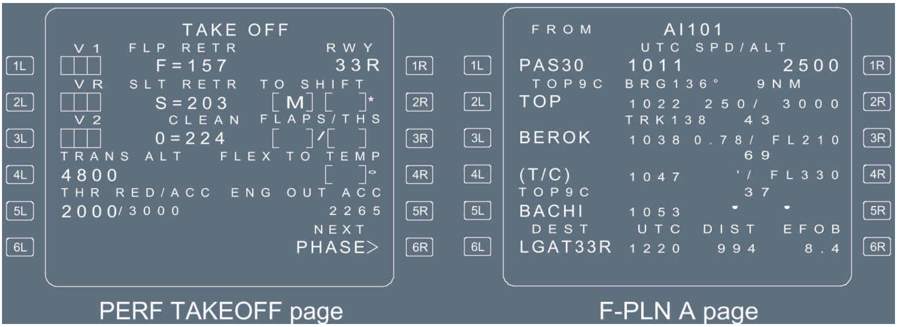
MCDU ALTITUDE PREDICTIONS

Ident.: DSC-22_20-60-10-00001307.0001001 / 17 MAR 11
Applicable to: ALL

The FMGES predicts at each waypoint of the flight plan an altitude that is a function of all data in the lateral and vertical flight plans.

ON THE GROUND

The altitude predicted at each waypoint is displayed as altitude in feet above mean sea level (AMSL) when it is below the transition altitude and as flight level when it is above the transition altitude. The altitude constraints are also displayed, and they follow the same rule (feet or flight level).
The predicted altitude is equal to the airport elevation plus the height you must attain in order to reach the waypoint in the applicable mode (climb or descent)



```
            TAKE OFF
 V1    FLP RETR         RWY
[][][]   F=157          33R
 VR    SLT RETR    TO SHIFT
[][][]   S=203     [M][   ]*
 V2       CLEAN  FLAPS/THS
[][][]   0=224     [   ]/[  ]
TRANS ALT      FLEX TO TEMP
4800                  [   ]°
THR RED/ACC    ENG OUT ACC
2000/3000             2265
                      NEXT
                    PHASE>
```

PERF TAKEOFF page

```
  FROM        AI101
            UTC  SPD/ALT
PAS30       1011         2500
  TOP9C     BRG136°     9NM
TOP         1022   250/  3000
            TRK138      43
BEROK       1038  0.78/ FL210
                   69
(T/C)       1047     '/ FL330
TOP9C               37
BACHI       1053
  DEST      UTC    DIST  EFOB
LGAT33R     1220    994   8.4
```

F-PLN A page

IN FLIGHT

The predicted altitude is equal to the aircraft altitude (depending on the barometer setting), plus (or minus) the height you must attain to reach the waypoint in the applicable mode (climb or descent).

- In climb :
  Altitude predictions and constraints are displayed as altitude in feet above mean sea level (AMSL) at, or below, the transition altitude, and as flight level above it.
  For example : If the transition altitude is 5 000 ft, and you insert an altitude constraint as 8 000 ft, the MCDU F-PLN A page shows it as FL 80.
- In descent :
  If “STD” is selected on the control panel of the EIS altitude predictions, and constraints above the transition level are displayed as flight levels, and those below the transition level are displayed as altitude AMSL.
  If sea level pressure (QNH), or field elevation pressure (QFE option), is selected on the EIS control panel, altitude predictions and constraints are displayed as altitudes AMSL, regardless of the transition altitude.
  For example : If the transition level is FL 50 and you insert an altitude constraint of 8 000 ft in the descent profile, the MCDU F-PLN A page will display it as FL 80 if “STD” is selected, and as 8 000 ft if the “QNH” or “QFE” option is selected.

TARGET ALTITUDE ON PFD

Ident.: DSC-22_20-60-10-00001308.0001001 / 17 MAR 11
Applicable to: ALL

The PFD target altitude may either be :
- The FCU-selected altitude, or
- A flight management altitude constraint, if the climb mode or descent mode is engaged, and the system predicts a level-off at a constraint that is achieved prior to reaching the FCU altitude.

The PFD target altitude depends on the barometer setting :
- If “STD” is selected, the target is a flight level.
- If “QNH” or “QFE” is selected, the target is an altitude or a height.

The aircraft will level off accordingly.

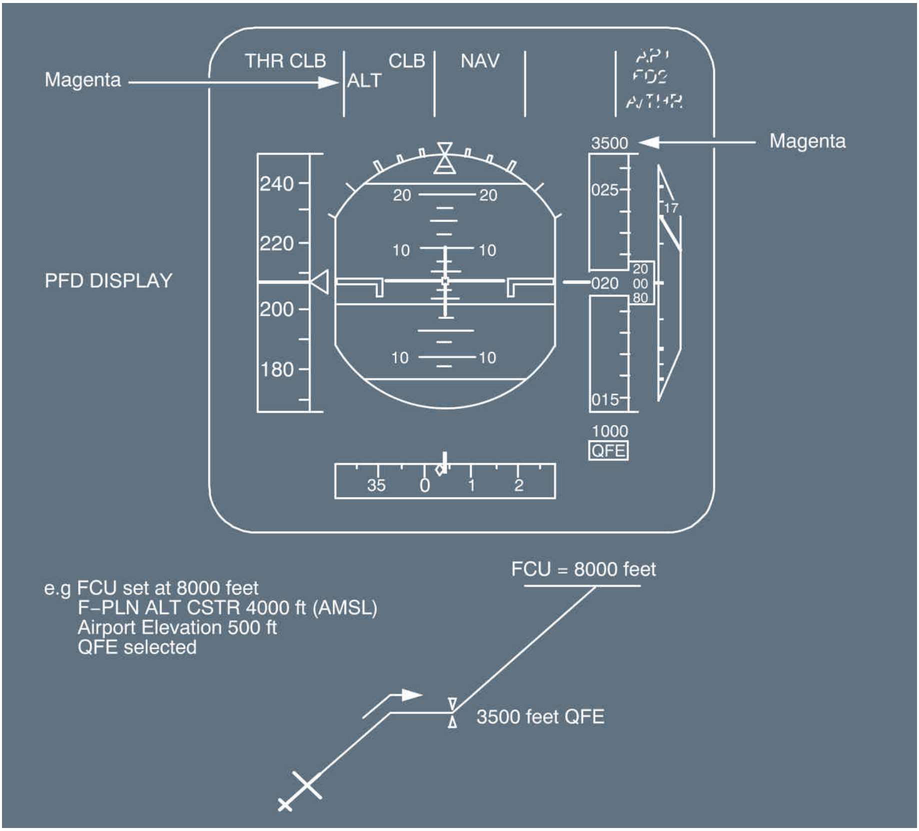
Note: *If the pilot changes the barometer pressure during ALT* or ALT CST*, the aircraft may overshoot the target altitude, because the current value has been changed. However, the ALT* and ALT CST* modes allow the aircraft to regain the FCU altitude.*
As a general rule, avoid changing the barometer setting when in ALT or ALT CST*.*

NOTE FOR AIRCRAFT WITH QFE (FIELD ELEVATION PRESSURE) PIN PROGRAM

Ident.: DSC-22_20-60-10-00001309.0001001 / 01 OCT 12
Applicable to: ALL

If QFE is selected on the EFIS control panel :

- The MCDU predictions follow the basic rules (altitudes are AMSL below the transition level, flight levels above it).
- The altitude constraints on the MCDU follow the basic rules.
- The target altitude on the PFD is QFE related :
  - If the target altitude has been selected by the FCU, the aircraft will level off there.
  - If the target altitude is an altitude constraint, the PFD automatically shows that constraint as corrected by the airport elevation.


Magenta
THR CLB
ALT
CLB
NAV
AP1
FD2
A/THR
3500
Magenta
PFD DISPLAY
240
220
200
180
20
10
025
020
015
20
00
80
17
1000
QFE
35
0
1
2
FCU = 8000 feet
3500 feet QFE

e.g FCU set at 8000 feet
F-PLN ALT CSTR 4000 ft (AMSL)
Airport Elevation 500 ft
QFE selected

PROCEDURES

Ident.: DSC-22_20-60-20-00001310.0001001 / 08 JUL 15
Applicable to: ALL

a. The altitude constraints in departure and arrival procedures should be defined in the navigation database or by the pilot on the MCDU:
   - In terms of altitude AMSL below the transition altitude
   - In terms of flight level above the transition altitude

   If a departure procedure defines an altitude constraint as an AMSL altitude above the transition altitude, you must convert it to flight level, because the system and guidance will treat it as a flight level whenever you select the standard barometer setting.

b. In climb you should switch from QNH (or QFE) to STD on both EFIS control panels simultaneously when you reach the transition altitude.
   All MCDU altitude predictions and altitude constraints and all PFD altitude targets will be displayed as flight level.

c. In descent, when ATC clears you to an altitude below the transition altitude, you can select QNH (or QFE) on both EFIS control panels simultaneously.
   All MCDU altitude predictions and constraints and PFD targets are now altitude AMSL.

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CLEARING THE SCRATCHPAD OF DATA OR MESSAGES

Ident.: DSC-22_20-60-30-00001311.0001001 / 10 DEC 09
Applicable to: ALL

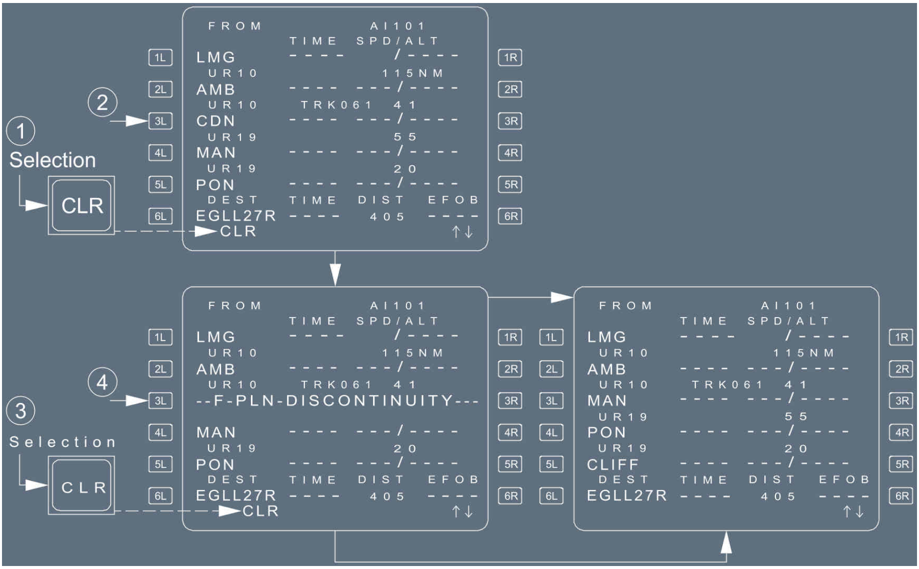
Press the “CLR” key with a single brief touch to erase the last alphanumeric character inserted in the scratchpad.
Press the key for more than three seconds to erase all the data inserted in the scratchpad. If the scratchpad is empty, it displays “CLR”.

CLEARING DATA FIELDS

Ident.: DSC-22_20-60-30-00001312.0001001 / 16 MAR 11
Applicable to: ALL

From a empty scratchpad, press the CLR key, then select the prompt for the field you want to clear (3L for example).

- You cannot clear all data fields:
  - If the field contains data that has a default value or a value computed by the FMGEC, the data reverts to this value.
  - Any attempt to clear the defaulted value has no effect.
- Clearing a constraint on the F-PLN A page deletes both the speed constraint and the altitude constraint associated with the waypoint.
- If you clear a data field that is a waypoint in the flight plan (primary or secondary) you delete this waypoint from the flight plan and create a discontinuity. The discontinuity can also be cleared in a similar way.


FROM AI101
TIME SPD/ALT
LMG ---- /-----
UR10 115NM
AMB ---- ---/-----
UR10 TRK061 41
CDN ---- ---/-----
UR19 55
MAN ---- ---/-----
UR19 20
PON ---- ---/-----
DEST TIME DIST EFOB
EGLL27R ---- 405 ----
CLR ↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
①
Selection
CLR
②
FROM AI101
TIME SPD/ALT
LMG ---- /-----
UR10 115NM
AMB ---- ---/-----
UR10 TRK061 41
--F-PLN-DISCONTINUITY---
MAN ---- ---/-----
UR19 20
PON ---- ---/-----
DEST TIME DIST EFOB
EGLL27R ---- 405 ----
CLR ↑↓
③
Selection
CLR
④
FROM AI101
TIME SPD/ALT
LMG ---- /-----
UR10 115NM
AMB ---- ---/-----
UR10 TRK061 41
MAN ---- ---/-----
UR19 55
PON ---- ---/-----
UR19 20
CLIFF ---- ---/-----
DEST TIME DIST EFOB
EGLL27R ---- 405 ----
↑↓

GENERAL

Ident.: DSC-22_20-60-40-00001313.0001001 / 16 MAR 11
Applicable to: ALL

When the FMGES detects an engine-out condition, the following occurs:

FLIGHT MANAGEMENT PART

Ident.: DSC-22_20-60-40-00001314.0001001 / 16 MAR 11
Applicable to: ALL

- The managed target speeds are immediately set to a value that depends upon the flight phase
- The system automatically calls up the current performance page, which has the E.O. CLR (engine-out clear) prompt, displayed in the 1R field (except during takeoff, before the diversion point is reached).
  If the pilot presses the E.O. CLR key, the all engine operative predictions and performance will be restored. Reverting to one engine-out performance again is not possible, unless the system detects a new E.O. condition. Therefore, the pilot should not press the E.O. CLR key, if an actual engine-out is detected.
- The PROG page shows the recommended engine-out maximum (E.O. REC MAX) altitude
- All preselected speeds, entered in the MCDU, are deleted. The crew can re-enter preselected speeds
- Step climb (or step descent), if entered, is deleted
- The time constraint is deleted.

FLIGHT GUIDANCE PART

Ident.: DSC-22_20-60-40-00001316.0003001 / 16 MAR 11
Applicable to: ALL

- All selected modes remain available (the “HDG/TRK”, “V/S”, and “OPEN” modes, for example)
- In the Speed Reference System (SRS) mode, the takeoff speed is the highest of V2 and current speed, but no more than V2 + 15. The Go-around speed target is VAPP, or the current speed if higher, but limited to VLS + 15 kt
- The system limits Autopilot (AP) and Flight Director (FD) bank angles during the takeoff and approach phases, as follows:
  - 15 ° when the aircraft speed is below maneuvering speeds (F, S, or Green Dot speed), - 10 kt
  - Then linear increase to 25 ° up to maneuvering speeds (F, S, or Green Dot speed) - 3 kt
  - 25 ° above maneuvering speeds (F, S, or Green dot speed) - 3 kt.

AUTOTHRUST

Ident.: DSC-22_20-60-40-00001317.0001001 / 04 MAY 23
Applicable to: ALL

The system extends the active range of the active engine from idle to maximum continuous thrust (MCT instead of CL thrust).
The Flight Mode Annunciator requests maximum continuous thrust on the live engine, at a time that depends on when the engine-out occurs.

Note: *Refer to DSC-22_30-50-50 ALPHA FLOOR for Alpha Floor inhibition in engine-out.*

ENGINE OUT CONDITIONS

Ident.: DSC-22_20-60-40-00001318.0001001 / 10 MAY 21
Applicable to: ALL

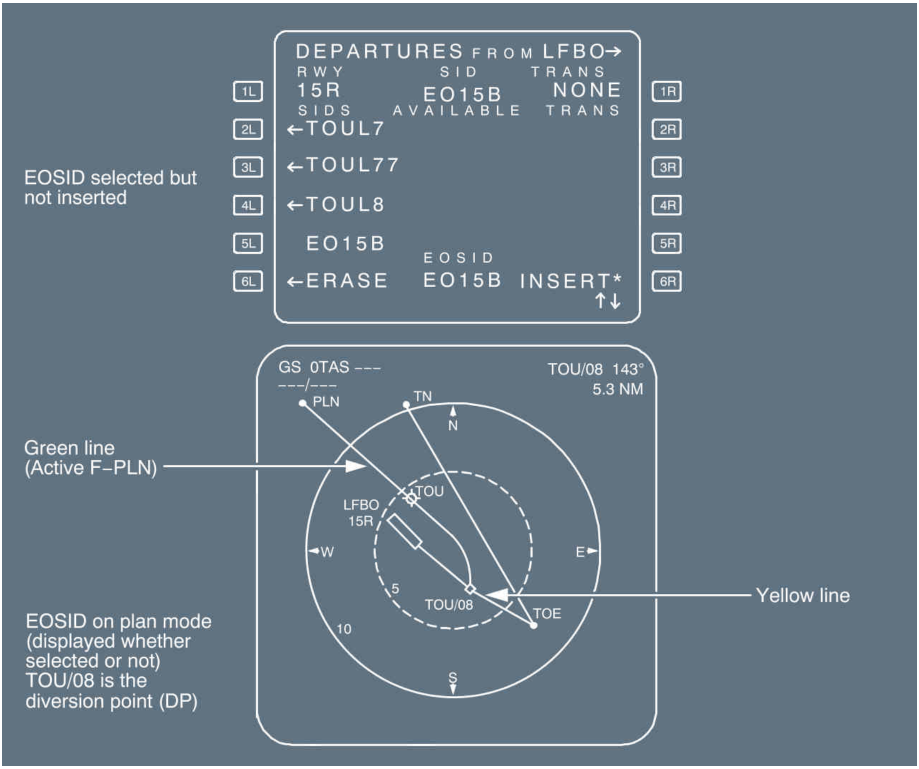
The FMGES considers the aircraft to be in an engine-out condition, when one of the following conditions is present, and the aircraft has started the takeoff, or is in flight:
- One engine master lever is off, or
- N2 (or N3 for Rolls Royce engines) is below idle, or
- One thrust lever is at IDLE position or slightly above IDLE position (0 ° < TLA < 5 °) and one thrust lever is above IDLE position area (5 ° < TLA < MAX TLA), or
- Communication between FMGEC and FADEC is lost.

ENGINE-OUT SID OPERATIONS

Applicable to: ALL

Ident.: DSC-22_20-60-40-A-00002683.0001001 / 01 OCT 12

An Engine-Out Standard Instrument Departure (EOSID), when defined in the database, is always for a specific runway. It is indicated on the bottom line of the SID page for that runway, and it can be manually selected.
The pilot can review the SID by either selecting the PLAN mode on the navigation display (solid yellow line), or by selecting it on the SID page. In the latter case, the navigation display shows the SID as a temporary flight plan.
The last point, if any, that is common to the SID and Engine-Out SID is called the Diversion Point (DP).


DEPARTURES FROM LFBO→
RWY
SID
TRANS
15R
EO15B
NONE
SIDS
AVAILABLE
TRANS
←TOUL7
←TOUL77
←TOUL8
EO15B
EOSID
←ERASE
EO15B
INSERT*
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GS 0TAS ---
---/---
TOU/08 143°
5.3 NM
PLN
TN
N
TOU
LFBO
15R
W
E
5
10
TOU/08
TOE
S

EOSID selected but not inserted

Green line (Active F–PLN)

Yellow line

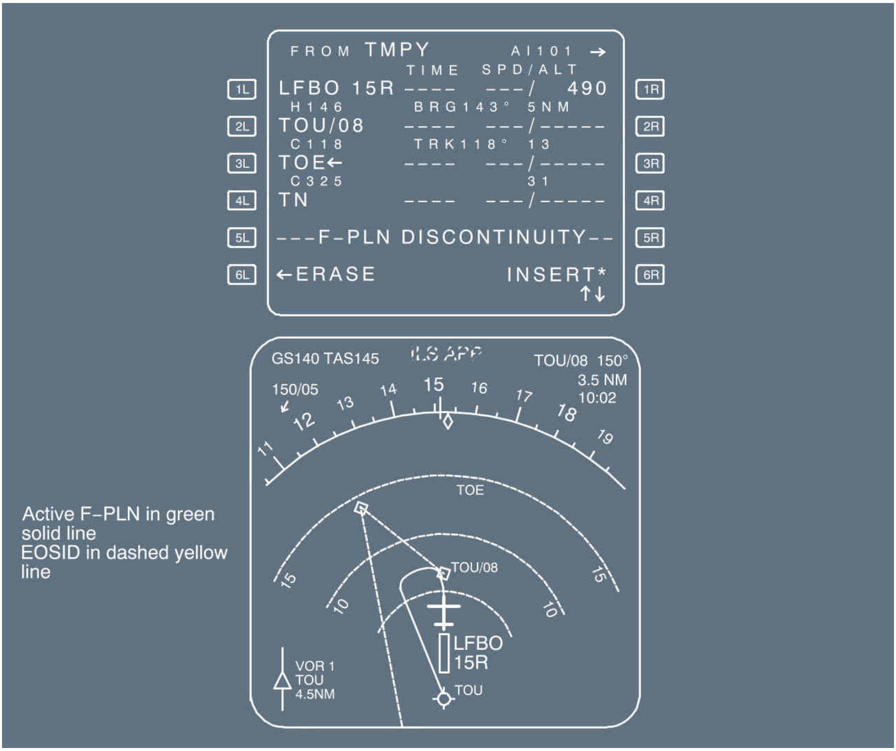
EOSID on plan mode (displayed whether selected or not) TOU/08 is the diversion point (DP)

Ident.: DSC-22_20-60-40-A-00005865.0001001 / 01 OCT 12

WHEN AN ENGINE-OUT CONDITION OCCURS BEFORE THE DIVERSION POINT

The MCDU automatically shows the engine-out SID as a temporary flight plan on the F-PLN page and on the ND. The EOSID can be inserted or erased.

Note: *The EOSID Diversion Point is the waypoint at which the EOSID diverges from the active SID.*
If there is no common leg between the SID and the EOSID in the navigation database, the diversion point is by default the runway threshold. Therefore the SID and EOSID common leg(s) before the flight paths separation must be the same type and nature.



```
FROM TMPY                 AI101 →
              TIME   SPD/ALT
LFBO 15R      ----   ---/   490
 H146          BRG143°  5NM
TOU/08        ----   ---/-----
 C118          TRK118°  13
TOE←          ----   ---/-----
 C325                   31
TN            ----   ---/-----
---F-PLN DISCONTINUITY--
←ERASE                INSERT*
                         ↑↓
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GS140 TAS145
ILS APP
TOU/08 150°
3.5 NM
10:02
150/05
11
12
13
14
15
16
17
18
19
TOE
15
10
TOU/08
10
15
LFBO
15R
TOU
VOR 1
TOU
4.5NM

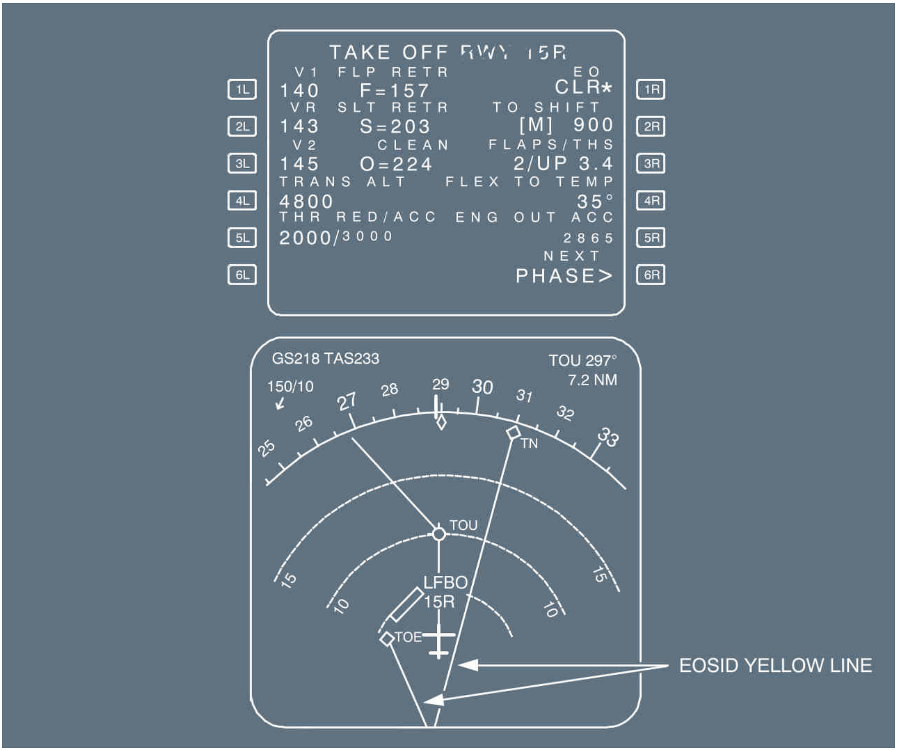
Active F–PLN in green solid line
EOSID in dashed yellow line

Ident.: DSC-22_20-60-40-A-00005866.0001001 / 01 OCT 12

WHEN AN ENGINE-OUT CONDITION OCCURS AFTER THE DIVERSION POINT

REMAIN on the SID path

Note: *The navigation display shows the engine-out SID as a yellow line for your information. Directing the aircraft to the EOSID should not be performed unless it allows obstacle clearance and the flight crew considers it is the best strategy for a particular case.*



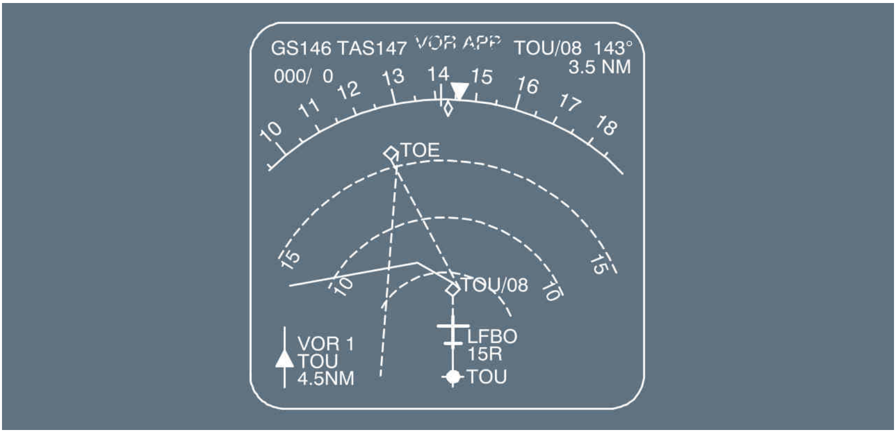
```
      TAKE OFF RWY 15R
 V1   FLP RETR           EO
140     F=157          CLR*
 VR   SLT RETR     TO SHIFT
143     S=203       [M]  900
 V2      CLEAN    FLAPS/THS
145     O=224       2/UP 3.4
TRANS ALT      FLEX TO TEMP
4800                    35°
THR RED/ACC    ENG OUT ACC
2000/3000              2865
                       NEXT
                     PHASE>
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GS218 TAS233
TOU 297°
7.2 NM
150/10
25
26
27
28
29
30
31
32
33
TN
TOU
15
10
LFBO
15R
TOE
10
15
EOSID YELLOW LINE

Ident.: DSC-22_20-60-40-A-00005867.0001001 / 19 DEC 12

BELOW THRUST-REDUCTION (THR RED) ALTITUDE

- The managed target speed changes.
- The PROG page displays the engine-out maximum recommended altitude.
- The PERF TO page comes up on the display automatically, with the “EO CLR” prompt in the 1R field.
- The MCDU and the navigation display show the engine-out SID as a temporary flight plan, or the navigation display shows it for information only, depending upon the diversion point location.
- The system computes the flight plan predictions when the aircraft transitions to the climb phase.



PROCEDURE

When the aircraft reaches the engine-out acceleration altitude :

PUSH the ALT pushbutton on the FCU.

The target speed jumps to the engine-out long-range cruise, limited by SPD LIM/SPD CSTR.

CLEAN up your configuration as the speed increases toward target speed.

When the aircraft is clean and has reached green dot speed , “LVR MCT” flashes on the FMA.

PULL the altitude selector knob to resume the climb.

The OP CLB mode engages.

MOVE the thrust lever(s) for the live engine(s) to “MCT” detent.

Ident.: DSC-22_20-60-40-A-00005868.0001001 / 16 MAR 11

ABOVE THRUST REDUCTION (THR RED) ALTITUDE

- The managed target speed changes.
- “LVR MCT” flashes white on the flight mode annunciator.
- The PROG page displays the engine-out maximum recommended altitude.
- The PERF TO page displays the “EO CLR*” prompt in the 1R field.
- The navigation display shows the EOSID.

PROCEDURE

MOVE the thrust lever(s) of the active engine(s) to the MCT detent.

- **When the aircraft reaches the engine-out acceleration altitude :**

  PRESS the ALT pushbutton on the FCU.

  The target speed jumps to the engine-out long-range cruise, limited by SPD LIM/SPD CSTR.

  CLEAN UP configuration as the speed increases.

- **When the aircraft reaches Green Dot speed :**

  PULL the ALT knob to resume the climb.

  The OP CLB mode engages.

  Note: *If it is necessary, move the thrust lever(s) of the active engine(s) to the TOGA detent. The Flight Mode Annunciator will display “LVR MCT”, flashing in amber, when the aircraft reaches Green Dot speed. If NAV mode is engaged and predictions are available, CLB mode may also be used to resume the climb.*

ENGINE-OUT IN CLB PHASE (ABOVE ACCELERATION ALTITUDE)

Applicable to: ALL

Ident.: DSC-22_20-60-40-B-00001320.0001001 / 16 MAR 11

ENGINE-OUT OCCURS WHILE AIRCRAFT IS BELOW EO REC MAX

- The managed target speed changes to Green Dot speed.
  If the aircraft is in ALT or ALT* mode, the speed target is the engine-out long range cruise speed at that altitude, limited by SPD LIM or SPD CSTR.
  The target speed change is gradual, so as to prevent a strong thrust reduction.
- “LVR MCT” flashes amber on the Flight Mode Annunciator.
- The system computes the flight plan predictions down to the primary destination, assuming that the cruise phase will be flown at the lower of CRZ ALT or EO REC MAX.
- The MCDU shows the PERF CLB page with an “EO CLR*” (clear engine-out) prompt.
- The PROG page shows the engine-out maximum recommended altitude (EO REC MAX).

PROCEDURE

MOVE the thrust lever(s) for the live engine(s) to the MCT detent.
SET the altitude on the Flight Control Unit to an altitude below the engine-out maximum recovery altitude, as cleared by ATC.
INITIATE a diversion, when cleared to do so.

Ident.: DSC-22_20-60-40-B-00005869.0001001 / 10 DEC 09

ENGINE-OUT OCCURS WHILE THE AIRCRAFT IS ABOVE EO REC MAX

- "LVR MCT" (maximum continuous thrust) flashes amber on the Flight Mode Annunciator.
- The climb mode (if engaged) reverts to open climb (OP CLB).
- The system computes the flight plan predictions down to the primary destination, assuming that the aircraft immediately drifts from the current altitude down to the EO MAX ALT at green dot, and then cruises at this altitude

Note: *You cannot arm or engage CLB mode, above EO REC MAX.*

PROCEDURE

Same as engine-out in cruise phase (*Refer to DSC-22_20-60-40 Engine-Out in Cruise Phase*).

ENGINE-OUT IN CRUISE PHASE

Ident.: DSC-22_20-60-40-00001321.0001001 / 17 NOV 20
Applicable to: ALL

The system sets the managed target speed to the long range engine-out cruise at that altitude.
If the aircraft is above the Engine-Out Maximum Altitude (EO REC MAX), the target speed is the long range engine-out cruise speed at EO REC MAX. The target speed change is gradual, so as to prevent a strong engine thrust reduction.

- LVR MCT flashes on the Flight Mode Annunciator.
- The performance cruise page appears with the "EO CLR*" (clear engine-out) prompt, and displays the level off altitude assuming descent and cruise at green dot speed (obstacle strategy).
- The progress page displays "EO REC MAX".
- The system computes the flight plan predictions down to the primary destination, assuming that the cruise phase at the lower of CRZ FL or EO REC MAX.

PROCEDURE

Perform the engine-out abnormal procedure.
Refer to the "Single Engine Operations" procedures (*Refer to EFB-IFT-30 One Engine Inoperative Strategies*).

Initiate a diversion, if necessary.

Note:
- *The engine-out descent strategy requires disconnection of the autothrust, and descent in OPEN DES mode.*
  Disconnecting the autothrust prevents an automatic setting of THR IDLE, therefore, the autopilot will fly the target speed in OP DES mode with a thrust manually selected by the crew.
  When reaching the FCU-selected altitude, or whenever normal descent is resumed to a lower altitude, reengage the autothrust.
- *DES mode is not available above EO REC MAX.*

ENGINE-OUT IN DESCENT PHASE

Ident.: DSC-22_20-60-40-00001322.0001001 / 16 MAR 11
Applicable to: ALL

- The managed target speed remains unchanged (ECON DES Mach number or speed, with any speed limitations).
- “LVR MCT” flashes on the Flight Mode Annunciator.
- The PERF DES page appears, showing the “EO CLR*” prompt.
- The PROG page displays the engine-out maximum altitude (EO REC MAX).
- The descent mode (if engaged) reverts to V/S, if the aircraft is above the EO REC MAX. If not, the descent mode is maintained.

PROCEDURE

MOVE the thrust lever(s) for the live engine(s) to the MCT detent.
If necessary, SELECT a suitable flight mode for descent.
DISCONNECT the autothrust and ADJUST thrust, if necessary.

Note: *The system recomputes the descent and approach paths, based on 2 or 3 engine models for the A340, or on a single engine model for the A330.*

ENGINE-OUT IN APPROACH PHASE

Ident.: DSC-22_20-60-40-00001323.0001001 / 16 MAR 11
Applicable to: ALL

- The aircraft maintains approach speed (VAPP)
- “LVR MCT” flashes on the Flight Mode Annunciator
- The PERF APPR page appears, showing the “EO CLR*” prompt
- The PROG page displays the engine-out maximum altitude (EO REC MAX).

PROCEDURE

MOVE the thrust lever(s) for the live engine(s) to the MCT detent.

SELECT a suitable flight mode as for an all engine approach.

CAUTION	*Below maneuvering speed (F, S, Green Dot) - 10 kt, the autopilot or flight director (AP/FD) cannot order a bank angle greater than 15 °. Above maneuvering speed - 10 kt, this limit linearly increases until it reaches 25 ° at maneuvering speed - 3 kt. The limit is then 25 ° for all speeds above maneuvering speeds - 3 kt.*

ENGINE-OUT IN GO-AROUND PHASE

Ident.: DSC-22_20-60-40-00001324.0001001 / 16 MAR 11
Applicable to: ALL

The results and procedures for takeoff phase apply, however the displays do not show the engine-out SID.

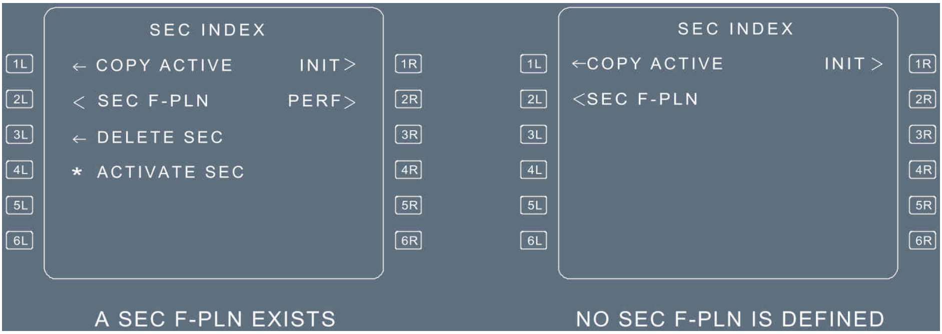
Note: *If ALT* engages out of SRS mode, and an engine-out occurs simultaneously, an airspeed loss may be encountered during the altitude capture.*

SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-60-50-00001325.0001001 / 17 MAR 11
Applicable to: LV-GKO, LV-GKP

The secondary flight plan (SEC F-PLN) is an alternative flight plan which can be activated when required.
It may include all the vertical elements except history wind data.

The flight crew can:
- Create a secondary flight plan independently from the active flight plan (a secondary flight plan can be created while a temporary flight plan exists)
- Copy it from the active flight plan
- Delete it completely
- Activate it, when the “ACTIVATE SEC” prompt is displayed: The secondary flight plan becomes the active flight plan.



A SEC F-PLN EXISTS

NO SEC F-PLN IS DEFINED

- The screen displays the “ACTIVATE SEC” prompt in flight if:
  - HDG (or TRK) mode is engaged, or
  - NAV mode is engaged, and the active leg of the primary and secondary flight plans is the same.
- The screen displays the “INIT” prompt if the secondary flight plan is not a copy of the active flight plan.

The FMS sequences the secondary flight plan the same way as the active flight plan, when it is a copy of the active flight plan.
The navigation display shows the secondary flight plan in white. In PLAN mode, the flight crew can use the slew keys to review the secondary flight plan (as for the primary flight plan).

PREDICTIONS

The FMGES computes predictions using the same performance methods and performance factor as for the active flight plan. However, it predicts pseudo waypoints only for the Multifunction Control and Display Unit (MCDU), and not for the Navigation Display (ND).

- **When the flight crew initializes the secondary flight plan with the SEC INIT function:**
  The FMGES computes the secondary flight plan predictions as if the aircraft were on ground before engine start. The FMGES computes these predictions one time and does not update them to indicate the progress of the flight (aircraft position, fuel consumption, etc.).
- **When the flight crew initializes the secondary flight plan with the COPY ACTIVE function:**

  The FMGES computes the secondary flight plan predictions as for the active flight plan. However:
  - The FMGES stops the update and the display of the predictions if the first leg of the active flight plan is no longer the same as the active leg (i.e. if both flight plans diverge).

    Note: *This does not apply to the preflight phase, when the FMGES computes the predictions if the departure airports are the same, even if the takeoff runways are different.*

  In the SEC F-PLN, the computed distance between the "TO" waypoint, and the following waypoints may be erroneous when:
  - ■ The SEC F-LPN is created using the COPY ACTIVE function
  - ■ Lateral modifications are performed in either the active, or the SEC F-LPN
  - ■ The "TO" waypoint and/or the following waypoint differ between the ACTIVE , and the SEC F-PLN.

  Note: *1. As a result, in the SEC P-PLN, fuel and time predictions are also erroneous because they are computed using the erroneous distance.*
  2. If the SEC F-PLN is activated, the resulting ACTIVE F-PLN is not affected: Distances and fuel/time computations in the active F-PLN are correct.
- **The flight crew may use the secondary flight plan in the following cases:**
  - At takeoff when an alternate takeoff runway is probable
  - On ground to initialize the FMGES again if the flight that the flight crew initially prepared is replaced by another flight (*Refer to PRO-NOR-SRP-01-05 Introduction*)
  - In flight to prepare a diversion
  - In flight when an alternate landing runway is probable
  - To prepare the next flight.

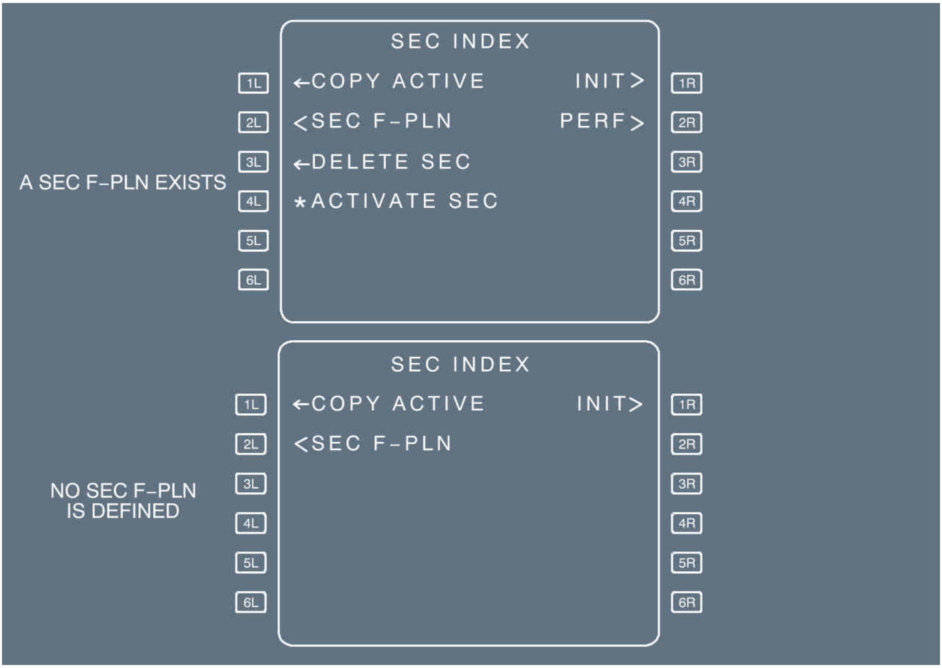
SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-60-50-00001325.0015001 / 01 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The secondary flight plan (SEC F-PLN) is an alternative flight plan which can be activated when required.
It may include all the vertical elements except history wind data.

The flight crew can:

- Create a secondary flight plan independently from the active flight plan (a secondary flight plan can be created while a temporary flight plan exists)
- Copy it from the active flight plan
- Delete it completely
- Activate it, when the “ACTIVATE SEC” prompt is displayed: The secondary flight plan becomes the active flight plan.


A SEC F-PLN EXISTS
SEC INDEX
←COPY ACTIVE
INIT>
<SEC F-PLN
PERF>
←DELETE SEC
*ACTIVATE SEC
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
NO SEC F-PLN IS DEFINED
SEC INDEX
←COPY ACTIVE
INIT>
<SEC F-PLN
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R

- The screen displays the “ACTIVATE SEC” prompt in flight if:
  - HDG (or TRK) mode is engaged, or
  - NAV mode is engaged, and the active leg of the primary and secondary flight plans is the same.

The FMS sequences the secondary flight plan the same way as the active flight plan, when it is a copy of the active flight plan.
The navigation display shows the secondary flight plan in white. In PLAN mode, the flight crew can use the slew keys to review the secondary flight plan (as for the primary flight plan).

PREDICTIONS

The FMGES computes predictions using the same performance methods and performance factor as for the active flight plan. However, it predicts pseudo waypoints only for the Multifunction Control and Display Unit (MCDU), and not for the Navigation Display (ND).

- **When the flight crew initializes the secondary flight plan with the SEC INIT function:**
  The FMGES computes the secondary flight plan predictions as if the aircraft were on ground before engine start. The FMGES computes these predictions one time and does not update them to indicate the progress of the flight (aircraft position, fuel consumption, etc.).
- **When the flight crew initializes the secondary flight plan with the COPY ACTIVE function:**

  The FMGES computes the secondary flight plan predictions as for the active flight plan. However:
  - The FMGES stops the update and the display of the predictions if the first leg of the active flight plan is no longer the same as the active leg (i.e. if both flight plans diverge). The flight phase is the same as the flight phase at the time of the divergence.

    Note: *This does not apply to the preflight phase, when the FMGES computes the predictions if the departure airports are the same, even if the takeoff runways are different.*

The flight crew may use the secondary flight plan in the following cases:
- At takeoff when an alternate takeoff runway is probable
- On ground to initialize the FMGES again if the flight that the flight crew initially prepared is replaced by another flight (*Refer to PRO-NOR-SRP-01-05 Introduction*)
- In flight to prepare a diversion
- In flight when an alternate landing runway is probable
- To prepare the next flight.

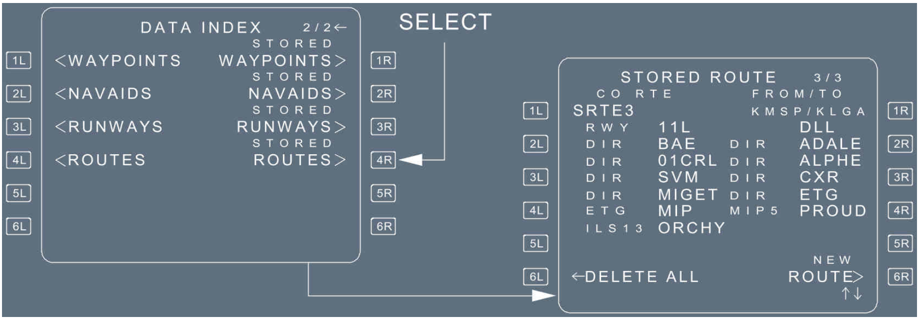
STORED ROUTE FUNCTION

Ident.: DSC-22_20-60-60-00001326.0001001 / 17 MAR 11
Applicable to: ALL

The stored route function allows the pilot to store or review as many as five different routes defined in an active or secondary flight plan.

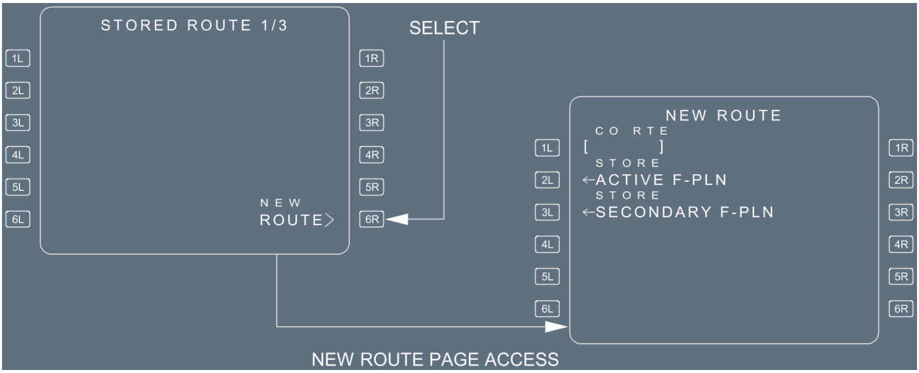
This also allows the pilot to store a company route that is not yet in the database, but is expected to be flown several times (a charter route, for example).

Access the STORED ROUTES page from the DATA INDEX page.


DATA INDEX 2/2←
<WAYPOINTS
STORED WAYPOINTS>
<NAVAIDS
STORED NAVAIDS>
<RUNWAYS
STORED RUNWAYS>
<ROUTES
STORED ROUTES>
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
SELECT
STORED ROUTE 3/3
CO RTE
SRTE3
FROM/TO
KMSP/KLGA
RWY 11L
DLL
DIR BAE
DIR ADALE
DIR 01CRL
DIR ALPHE
DIR SVM
DIR CXR
DIR MIGET
DIR ETG
ETG MIP
MIP5 PROUD
ILS13 ORCHY
←DELETE ALL
NEW ROUTE>
↑↓

A stored route can be reviewed by using the slew key.

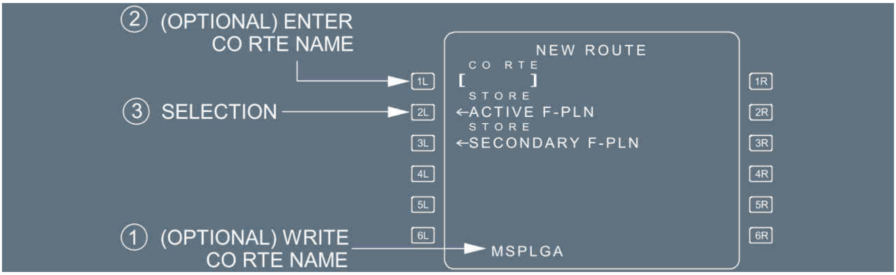
In order to store a new route, first define the route through the active flight plan (on the ground only), or the secondary flight plan (on the ground or in flight), then proceed as described below.


STORED ROUTE 1/3
NEW ROUTE>
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
SELECT
NEW ROUTE
CO RTE
[ ]
STORE
←ACTIVE F-PLN
STORE
←SECONDARY F-PLN
NEW ROUTE PAGE ACCESS

HOW TO STORE THE ACTIVE FLIGHT PLAN (DURING PREFLIGHT ONLY)

SELECT the DATA key on MCDU
PRESS the next page key

PRESS the “STORED ROUTES” key
PRESS the “NEW ROUTE” key
ENTER the company route name (optional)
PRESS the “STORE ACTIVE F-PLN” key


② (OPTIONAL) ENTER CO RTE NAME
③ SELECTION
① (OPTIONAL) WRITE CO RTE NAME
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
NEW ROUTE
CO RTE
[ ]
STORE
←ACTIVE F-PLN
STORE
←SECONDARY F-PLN
MSPLGA

HOW TO STORE THE SECONDARY FLIGHT PLAN

SELECT the DATA key on MCDU
PRESS the next page key
PRESS the “STORED ROUTES” key
PRESS the “NEW ROUTES” key
ENTER the company route name (optional)
PRESS the “STORE SECONDARY F-PLN” key

Note:
- *In either case, you may store a company route only if the active or secondary flight plan is complete from origin to destination.*
- *If you do not enter a name, the FMGEC names the stored route automatically as “SRTE 1 (or 2 ...)” when it is stored.*
- *The system does not retain several elements of the flight plans when you store them :*
  - *Pilot-entered holds*
  - *Offsets*
  - *Pilot-entered constraints*
  - *Modifications to a terminal procedure*
  - *Pseudo waypoints*

    When this happens, it displays “REVISIONS NOT STORED”.
- *If you already stored five routes, the system will reject a new entry and display “STORED ROUTES FULL” on the MCDU. Delete one stored route by clearing the CO RTE name before inserting a new one.*

TIME MARKER

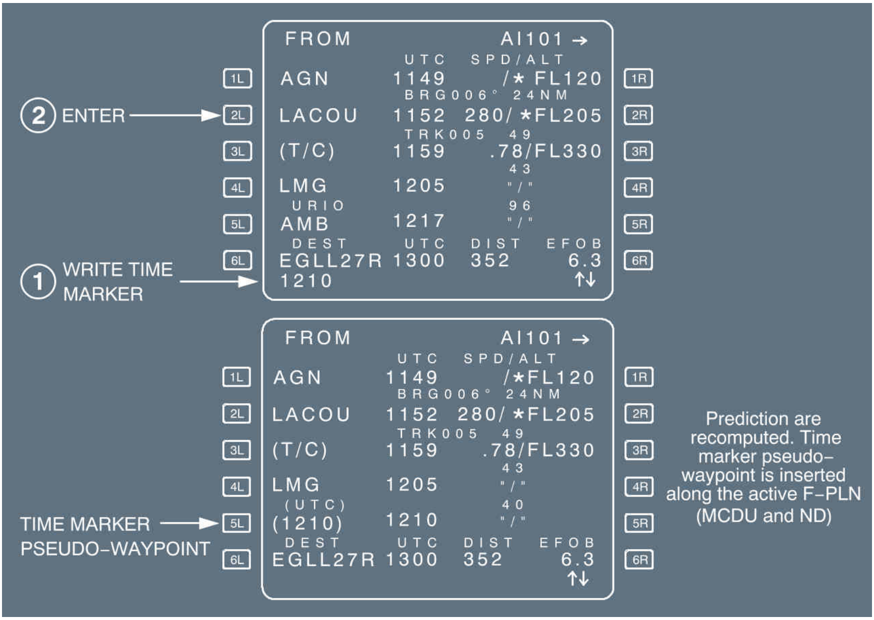
Ident.: DSC-22_20-60-70-00001327.0001001 / 01 OCT 12
Applicable to: ALL

The pilot can enter a time marker in the F-PLN A or B page. Once entered, the FMGES displays a pseudo waypoint along the flight plan on the MCDU and on the navigation display. This pseudo waypoint shows the predicted location of the aircraft at the entered time.

HOW TO INSERT A TIME MARKER

WRITE the time marker in the scratchpad. The entry format is HHMM.
SELECT any left key of the F-PLN A or B page, to insert the time marker in the active flight plan.

The time marker is inserted in the flight plan according to time criteria, irrespective of the key choosen for entry.



```
FROM                    AI101 →
              UTC    SPD/ALT
AGN           1149     /* FL120
               BRG006°  24NM
LACOU         1152   280/ *FL205
               TRK005    49
(T/C)         1159     .78/FL330
                         43
LMG           1205        "/"
   URIO                  96
AMB           1217        "/"
   DEST       UTC    DIST    EFOB
EGLL27R       1300   352      6.3
1210                           ↑↓
```

```
FROM                    AI101 →
              UTC    SPD/ALT
AGN           1149     /*FL120
               BRG006°  24NM
LACOU         1152   280/ *FL205
               TRK005    49
(T/C)         1159     .78/FL330
                         43
LMG           1205        "/"
   (UTC)                 40
(1210)        1210        "/"
   DEST       UTC    DIST    EFOB
EGLL27R       1300   352      6.3
                               ↑↓
```

Prediction are recomputed. Time marker pseudo-waypoint is inserted along the active F-PLN (MCDU and ND)

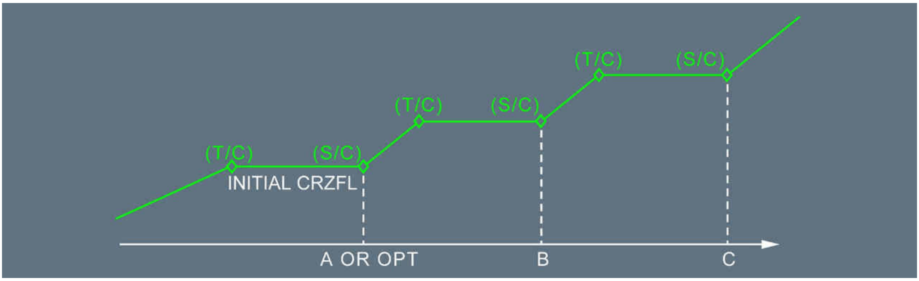
Up to 4 time markers may exist at a time. An attempt to enter a fifth time marker will cause the message "TIME MARKER LIST FULL" to appear on the scratchpad.
The FMGES updates the time marker position with the predictions.
When the current clock time equals or exceeds the time marker entry, the FMGES sequences the time marker (even in preflight).

Intentionally left blank

STEP CLIMB/STEP DESCENT

Ident.: DSC-22_20-60-80-00001328.0008001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The STEP ALTS function allows to define the successive CRZ FLs and to determine the optimum position to initiate a climb from the initial (or current) CRZ FL to the next one.



PRINCIPLE

GEOGRAPHIC STEPS

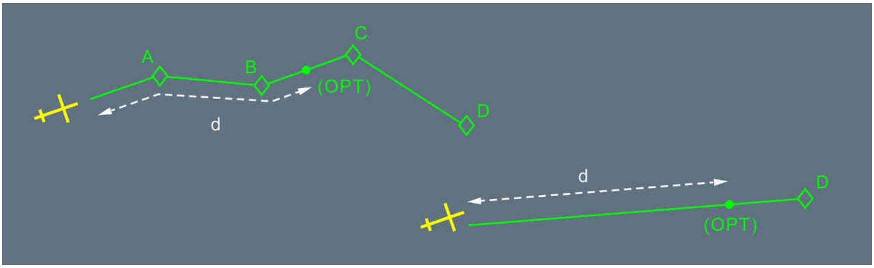
Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at a geographical position, along the F-PLN.

Rules

- The minimum step size is 1 000 ft
- A S/C cannot follow a S/D
- A STEP is automatically cleared:
  - If the S/C (S/D) is sequenced without any level change commanded by the flight crew
  - If the flight crew achieves a LAT REV which deletes the associated waypoint from the F-PLN
  - By EO condition.
- A STEP is manually cleared:
  - On the STEP ALTS page, by CLEARING the corresponding field
  - On the F-PLN page, by CLEARING the (S/C) (S/D) pseudo waypoint.
- A STEP entry is IGNORED if the remaining CRZ distance is less than approximately 50 NM
- When the steps are inserted in the F-PLN, they are displayed:
  - On the MCDU as (S/C), (S/D), (T/C), (T/D) pseudo waypoints
  - On the ND by associated ↗, ↘, ↘ white symbol.

OPTIMUM STEP

When geographic steps are inserted, or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead. Predicted FUEL and TIME savings are displayed when calculated to be greater than 100 kg or 1 min respectively. If no savings are found, no optimum step is proposed.
The OPT STEP is not automatically inserted: The flight crew has to insert it if appropriate. When inserted, the OPT STEP point (OPT), is then a fixed geographical point.
If, subsequently, some F-PLN parameters are changed (winds, new waypoints, ...) an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.
When an OPT STEP is inserted in the F-PLN, and the flight crew achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN at the same distance from the aircraft position, as previously determined.



Rules

- The OPT STEP is only computed by the FM if data required for the prediction computation are inserted: F-PLN, CRZ FL, CI, GW, CG at least
- The search of the OPT STEP begins 20 NM beyond T/C before cruise, or ahead of aircraft position
- The search of the OPT STEP ends 20 NM before the next STEP POINT or 300 NM before the T/D
- Only one OPT STEP is computed at a time.

Guidance

When reaching the step point, the steps must be initiated by the flight crew by selecting the new CRZ FL and pushing the FCU ALT selector knob. If sequenced without any flight crew action, the step is automatically deleted.

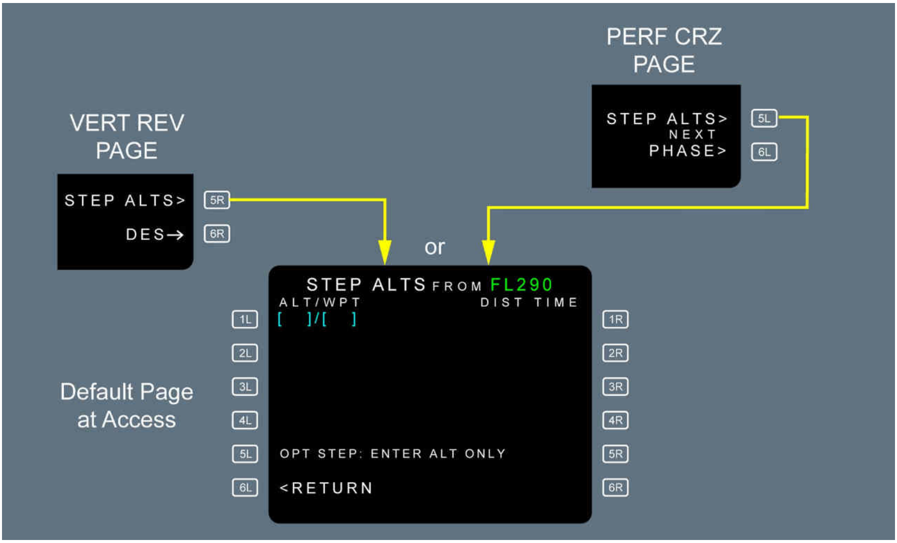
If the flight crew initiates the step:

- The CRZ FL is automatically reassigned to its new value
- The guidance is THR CLB/CLB for a step climb
  THR DES/DES with V/S = -1 000 ft/min for a step descent.

STEP ENTRY

The STEP ALTS page is either accessed from the:

- VERT REV page, or
- PERF CRZ page.


PERF CRZ PAGE
STEP ALTS>
NEXT PHASE>
5L
6L
VERT REV PAGE
STEP ALTS>
DES→
5R
6R
or
STEP ALTS FROM FL290
ALT/WPT
DIST TIME
[ ]/[ ]
OPT STEP: ENTER ALT ONLY
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
Default Page at Access

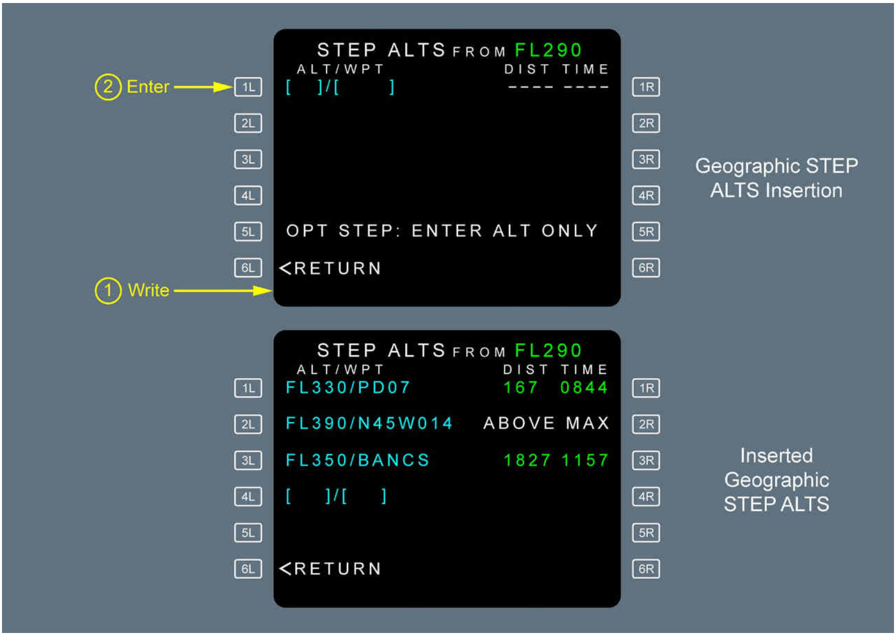
FOR GEOGRAPHIC STEP

PRESS the PERF key or PRESS the F-PLN key and SELECT VERT REV at a cruise waypoint. SELECT the STEP ALTS prompt.

WRITE the ALT/WPT in the scratchpad, and ENTER it in [1L] to [4L].

Note:
- *The position may be a waypoint ident, PBD, or PD*
- *The flight crew may enter FL 350/LMG/-20. The FMS will compute the geographic step 20 NM before LMG to FL 350*
- *To modify an inserted STEP:*
  - *To modify the CRZ FL only, enter it in the left key, as "FLXXX"*
  - *To modify the position only, enter it in the left key, as "/XXX"*
  - *To modify both, modify the position first, and then the CRZ FL (it is not possible to modify both in a single entry).*

CHECK the PREDICTIONS.

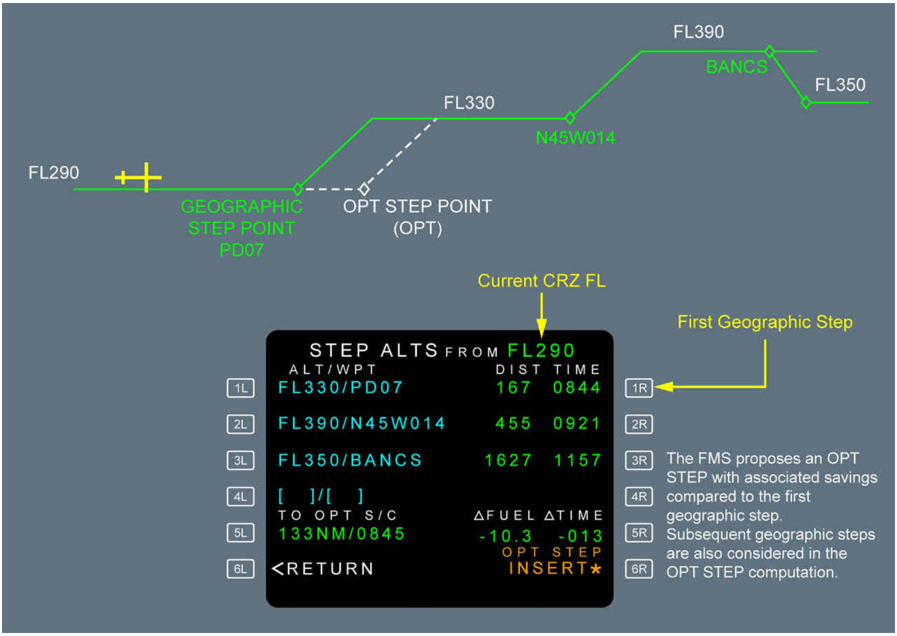


```
    STEP ALTS FROM FL290
  ALT/WPT              DIST TIME
[   ]/[      ]         ---- ----




OPT STEP: ENTER ALT ONLY
<RETURN
```

```
    STEP ALTS FROM FL290
  ALT/WPT              DIST TIME
FL330/PD07              167 0844
FL390/N45W014         ABOVE MAX
FL350/BANCS            1827 1157
[    ]/[    ]

<RETURN
```

FOR OPTIMAL STEP

When all geographical steps are inserted, and the predictions are available, the STEP ALTS page displays FUEL/TIME savings for the first step climb. If no significant savings are predicted, the NO OPTIMAL message is displayed.

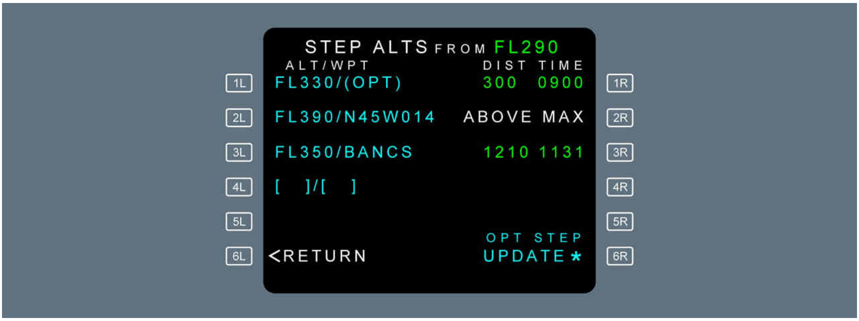

FL390
BANCS
FL350
FL330
N45W014
FL290
GEOGRAPHIC STEP POINT PD07
OPT STEP POINT (OPT)
Current CRZ FL
First Geographic Step
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
  STEP ALTS FROM FL290
 ALT/WPT            DIST TIME
FL330/PD07           167  0844

FL390/N45W014        455  0921

FL350/BANCS         1627  1157

[   ]/[   ]
TO OPT S/C        ΔFUEL ΔTIME
133NM/0845        -10.3  -013
                     OPT STEP
<RETURN               INSERT*
```

The FMS proposes an OPT STEP with associated savings compared to the first geographic step. Subsequent geographic steps are also considered in the OPT STEP computation.

- **To INSERT the proposed OPT STEP displayed in [5L]:**

  SELECT the INSERT* prompt in [6R].

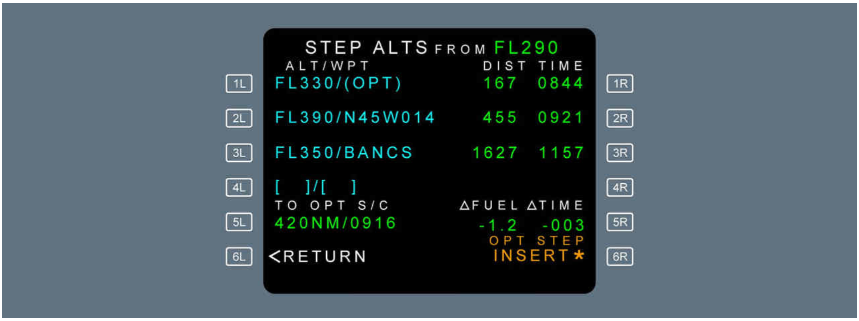

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
  STEP ALTS FROM FL290
 ALT/WPT            DIST TIME
FL330/(OPT)          300 0900

FL390/N45W014       ABOVE MAX

FL350/BANCS         1210 1131

[   ]/[   ]


                    OPT STEP
<RETURN             UPDATE*
```

The computed (OPT) step replaces the initially inserted step position, and is then considered at a fixed geographic position. Savings are no longer displayed, and the UPDATE prompt replaces the INSERT prompt. This prompt allows the flight crew to update the (OPT) step position, taking into account possible F-PLN or inserted wind changes.

If pressed, a new OPT point is proposed with associated SAVINGS and INSERT prompt, or NO OPTIMAL.

UPDATE prompt has been pressed, the new OPT STEP point provides additional savings:



```
 STEP ALTS FROM FL290
 ALT/WPT               DIST  TIME
FL330/(OPT)             167  0844

FL390/N45W014           455  0921

FL350/BANCS            1627  1157

[  ]/[  ]
TO OPT S/C            ΔFUEL ΔTIME
420NM/0916             -1.2  -003
                        OPT STEP
<RETURN                 INSERT*
```

TO DETERMINE THE OPTIMAL STEP LOCATION WHEN THERE ARE ONLY 2 CRZ FL IN THE F-PLN

The flight crew may obtain the OPT position of the STEP point, as follows:

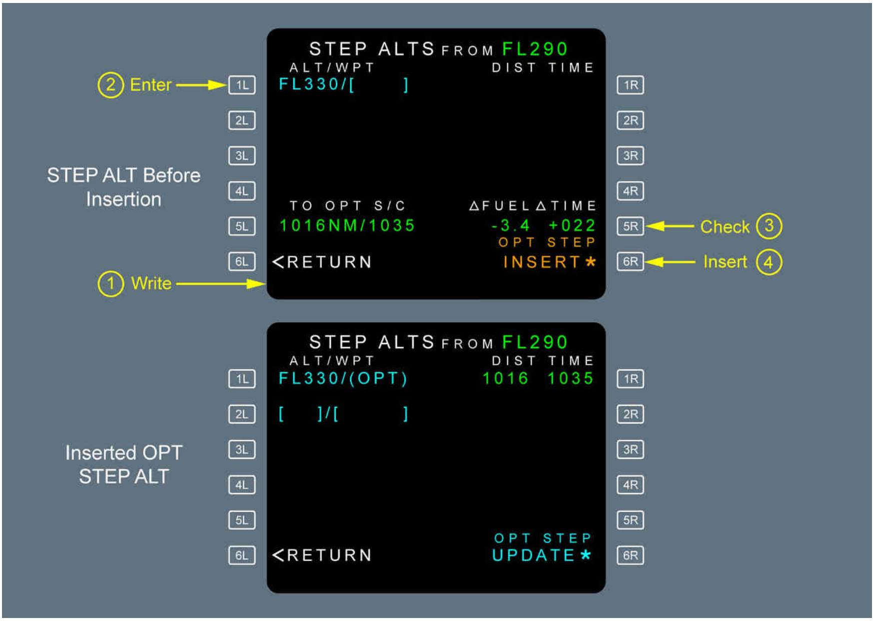
INSERT the initial cruise FL on INIT A page.
ENSURE that the ZFW, ZFWCG and BLOCK fuel are inserted in INIT FUEL PRED page.
WRITE the new CRZ FL in the STEP ALTS page, and INSERT it in the [1L] field.

Distance and time to optimum point and fuel/time saving are displayed.

CHECK the fuel and time savings and prediction in the [5R] field.

Savings are computed by comparing the entered step altitude, and the origin altitude of the step.

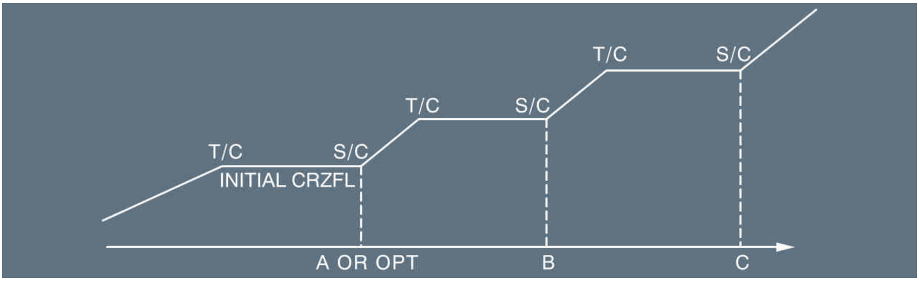
INSERT, if suitable.


② Enter
STEP ALT Before Insertion
① Write
Check ③
Insert ④
STEP ALTS FROM FL290
ALT/WPT
DIST TIME
FL330/[ ]
TO OPT S/C
ΔFUEL ΔTIME
1016NM/1035
-3.4 +022
OPT STEP
<RETURN
INSERT*
Inserted OPT STEP ALT
STEP ALTS FROM FL290
ALT/WPT
DIST TIME
FL330/(OPT)
1016 1035
[ ]/[ ]
OPT STEP
<RETURN
UPDATE*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

STEP CLIMB / STEP DESCENT

Ident.: DSC-22_20-60-80-00001328.0002001 / 12 APR 17
Applicable to: LV-GKO, LV-GKP

The STEP ALTS function allows to define the successive CRZ FLs and to determine the optimum position to initiate a climb from the initial (or current) CRZ FL to the next one.


T/C
S/C
INITIAL CRZFL
T/C
S/C
T/C
S/C
A OR OPT
B
C

PRINCIPLE

GEOGRAPHIC STEPS

Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at a geographical position, along the F-PLN.

Rules

- The minimum step size is 1 000 ft
- A Step Climb (S/C) cannot follow a Step Descent (S/D)
- A STEP is automatically cleared:
  - If the S/C (S/D) is sequenced without any level change commanded by the flight crew.
  - If the flight crew achieves a LAT REV which deletes the associated waypoint from the F-PLN
  - By EO condition.
- A STEP is manually cleared:
  - On the STEP ALTS page, by CLEARING the corresponding field
  - On the F-PLN page, by CLEARING the (S/C) (S/D) pseudo waypoint.
- A STEP entry is IGNORED if the remaining CRZ distance is less than approximately 50 NM
- When the steps are inserted in the F-PLN, they are displayed:
  - On the MCDU as (S/C), (S/D), (T/C), (T/D) pseudo waypoints
  - On the ND by associated ↗, ↘, ↘ white symbols.

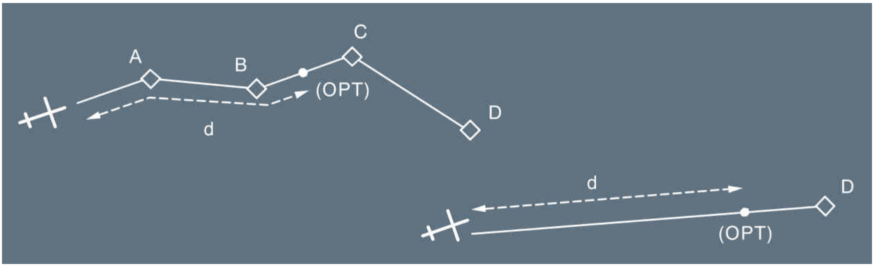
OPTIMUM STEP

When geographic steps are inserted, or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead. Predicted FUEL and TIME savings are displayed when calculated to be greater than 100 kg or 1 min respectively. If no savings are found, no optimum step is proposed.

The OPT STEP is not automatically inserted: The flight crew has to insert it if appropriate. When inserted, the OPT STEP point (OPT), is then a fixed geographical point.

If, subsequently, some F-PLN parameters are changed (winds, new waypoints, ...) an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.

When an OPT STEP is inserted in the F-PLN, and the flight crew achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN at the same distance from the aircraft position, as previously determined.



Rules

- The OPT STEP is only computed by the FM if data required for the prediction computation are inserted: F-PLN, CRZ FL, CI, GW, CG at least
- The search of the OPT STEP begins 20 NM beyond T/C before cruise, or ahead of aircraft position
- The search of the OPT STEP ends 20 NM before the next STEP POINT or 300 NM before the TOD
- Only one OPT STEP is computed at a time.

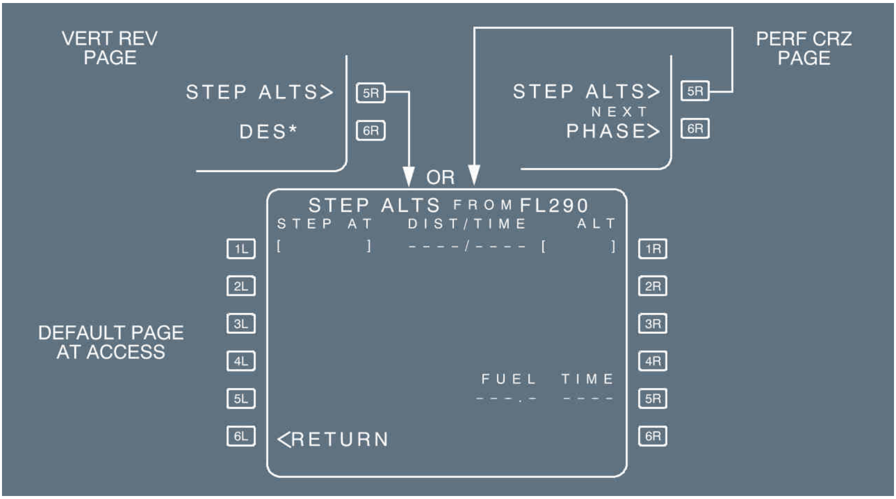
Guidance

When reaching the step point, the steps must be initiated by the flight crew by selecting the new CRZ FL and pushing the FCU ALT selector knob. If sequenced without any flight crew action, the step is automatically deleted.

If the flight crew initiates the step:
- The CRZ FL is automatically reassigned to its new value
- The guidance is THR CLB/CLB for a step climb
  THR DES/DES with V/S = -1 000 ft/min for a step descent.

STEP ENTRY

The STEP ALTS page is accessed :
- Either from the VERT REV page
- Or from the PERF CRZ page.


VERT REV PAGE
STEP ALTS>
DES*
5R
6R
PERF CRZ PAGE
STEP ALTS>
NEXT PHASE>
5R
6R
OR
STEP ALTS FROM FL290
STEP AT
DIST/TIME
ALT
[ ]
----/----
[ ]
FUEL
TIME
---.-

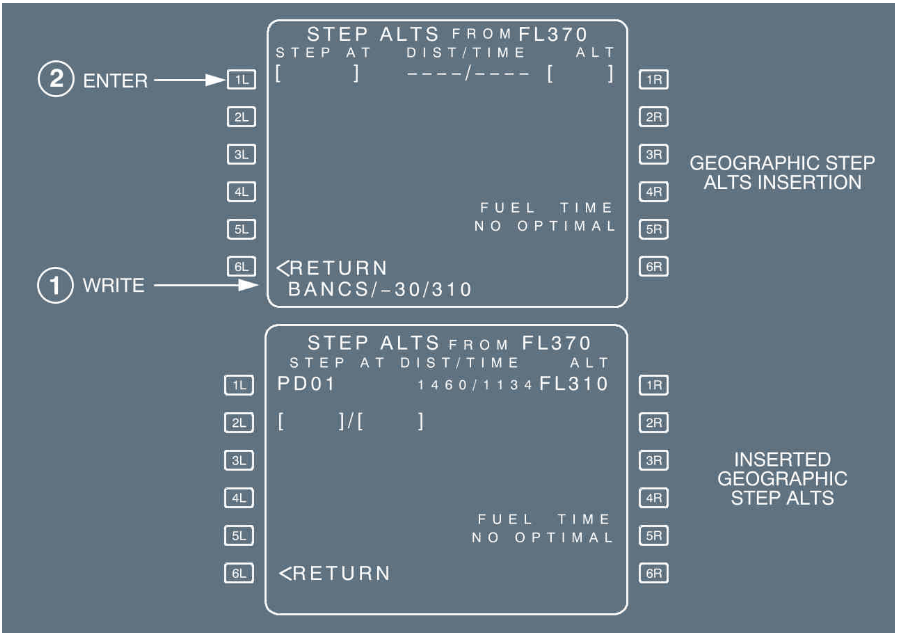
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
DEFAULT PAGE AT ACCESS

FOR GEOGRAPHIC STEP

PRESS the F-PLN or PERF key
SELECT vertical revision at a cruise waypoint
SELECT the STEP ALT prompt
WRITE in the scratchpad the POSITION/NEW CRZ FL, and ENTER in field 1L to 4L.

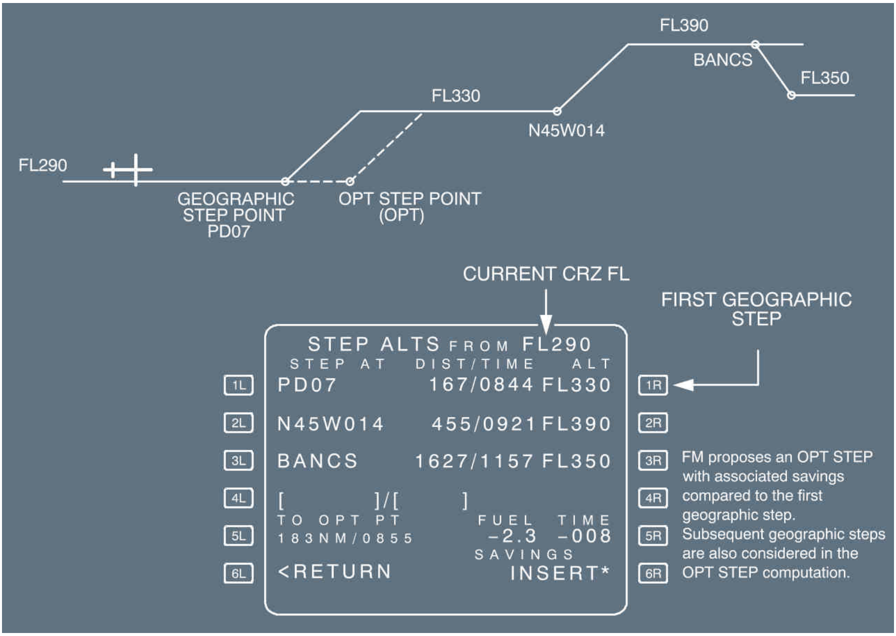
Note:
- *The position may be a waypoint ident, PBD, or PD*
- *The flight crew may enter LMG/-20/350. The FM will compute the geographic step 20 NM before LMG to FL 350*
- *To modify an inserted STEP:*
  - *Enter the CRZ FL using the [1R] key, to modify the CRZ FL only*
  - *Enter the position using the [1L] key, to modify the position only*
  - *Enter the position first and then the CRZ FL to modify both (it is not possible to modify both in a single entry).*

CHECK the PREDICTIONS


STEP ALTS FROM FL370
STEP AT DIST/TIME ALT
[ ] ----/---- [ ]
FUEL TIME
NO OPTIMAL
<RETURN
BANCS/-30/310
② ENTER
① WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GEOGRAPHIC STEP ALTS INSERTION
STEP ALTS FROM FL370
STEP AT DIST/TIME ALT
PD01 1460/1134 FL310
[ ]/[ ]
FUEL TIME
NO OPTIMAL
<RETURN
INSERTED GEOGRAPHIC STEP ALTS

FOR OPTIMAL STEP

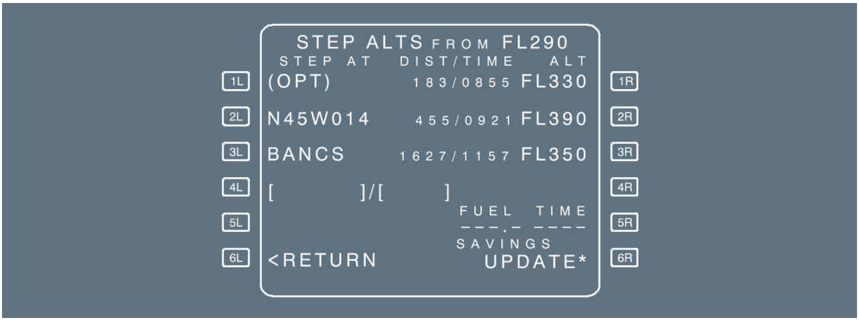
When all geographical steps are inserted, and the predictions are available, the STEP ALTS page displays FUEL/TIME savings for the first step climb. If no significant savings are predicted, the NO OPTIMAL message is displayed.


FL390
BANCS
FL350
FL330
N45W014
FL290
GEOGRAPHIC STEP POINT PD07
OPT STEP POINT (OPT)
CURRENT CRZ FL
FIRST GEOGRAPHIC STEP
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
STEP ALTS FROM FL290
 STEP AT    DIST/TIME   ALT
PD07         167/0844 FL330
N45W014      455/0921 FL390
BANCS       1627/1157 FL350
[        ]/[     ]
TO OPT PT         FUEL  TIME
183NM/0855        -2.3  -008
                  SAVINGS
<RETURN            INSERT*
```

FM proposes an OPT STEP with associated savings compared to the first geographic step.
Subsequent geographic steps are also considered in the OPT STEP computation.

- **If the flight crew wishes to INSERT the proposed OPT STEP:**
  SELECT the INSERT prompt

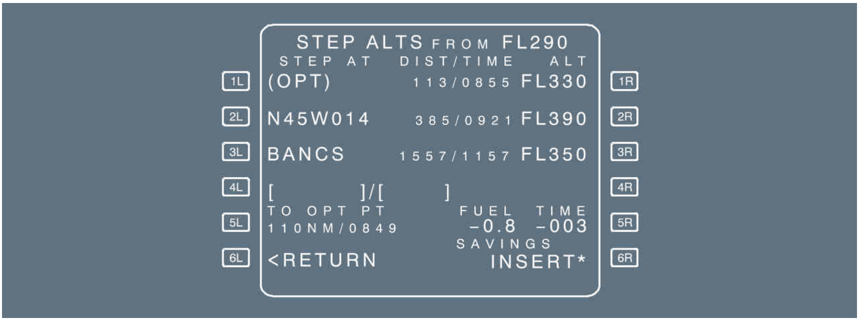

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
STEP ALTS FROM FL290
 STEP AT    DIST/TIME   ALT
(OPT)        183/0855 FL330
N45W014      455/0921 FL390
BANCS       1627/1157 FL350
[        ]/[     ]
                  FUEL  TIME
                  ---.- ----
                  SAVINGS
<RETURN            UPDATE*
```

The computed (OPT) step replaces the initially inserted step position, and is then considered at a fixed geographic position. Savings are no longer displayed, and the UPDATE prompt replaces the INSERT prompt. This prompt allows the flight crew to update the (OPT) step position, taking into account possible F-PLN or inserted wind changes.

If pressed, a new OPT point is proposed with associated SAVINGS and INSERT prompt, or NO OPTIMAL.

UPDATE prompt has been pressed, the new OPT STEP point provides additional savings:



```
    STEP ALTS FROM FL290
 STEP AT    DIST/TIME    ALT
(OPT)        113/0855  FL330
N45W014      385/0921  FL390
BANCS       1557/1157  FL350
[        ]/[       ]
TO OPT PT            FUEL  TIME
110NM/0849           -0.8  -003
                     SAVINGS
<RETURN               INSERT*
```

THERE ARE ONLY 2 CRZ FLS IN THE F-PLN

The flight crew may obtain the OPT position of the STEP point, as follows:

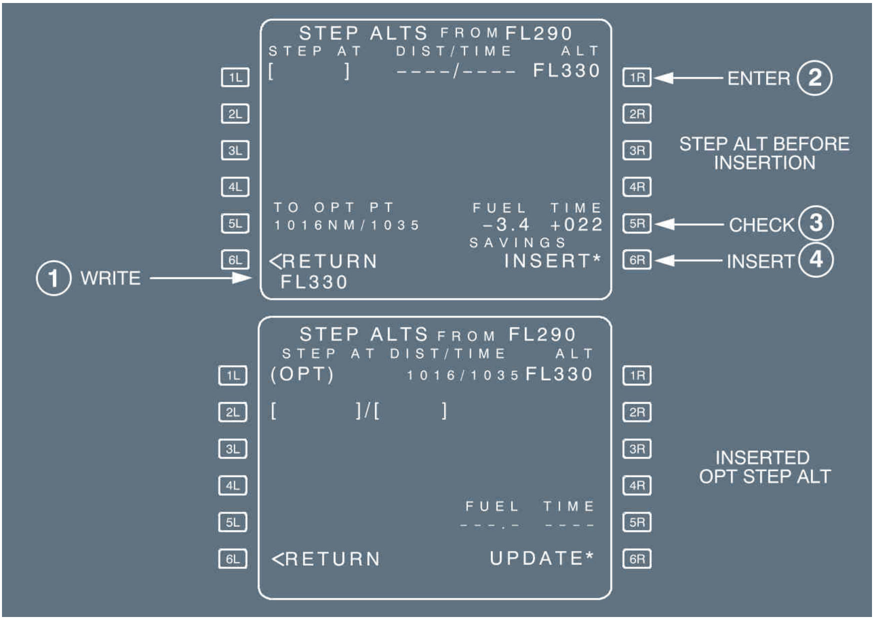
INSERT the initial cruise FL on INIT A page
ENSURE that the ZFW and BLOCK fuel are inserted in INIT B page
WRITE the new cruise FL in the STEP ALTS page, and INSERT it in the 1R field.

Distance and time to optimum point and fuel/time saving are displayed.

CHECK the fuel and time savings and prediction in fields 5L and 5R.

Savings are computed by comparing the entered step altitude, and the origin altitude of the step.

INSERT if suitable.


STEP ALTS FROM FL290
STEP AT DIST/TIME ALT
[ ] ----/---- FL330
TO OPT PT
1016NM/1035
FUEL TIME
-3.4 +022
SAVINGS
<RETURN
FL330
INSERT*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
① WRITE
ENTER ②
STEP ALT BEFORE INSERTION
CHECK ③
INSERT ④
STEP ALTS FROM FL290
STEP AT DIST/TIME ALT
(OPT) 1016/1035 FL330
[ ]/[ ]
FUEL TIME
----.- ----
<RETURN
UPDATE*
INSERTED OPT STEP ALT

Note: *No OPT STEP is available in the SEC F-PLN.*

MESSAGES

Messages may be displayed in the DIST/TIME field:

- “ABOVE MAX” if the inserted step altitude exceeds the MAX MAX ALT.
  The “STEP ABOVE MAX FL” scratchpad message is associated to the “ABOVE MAX” message.
- “IGNORED”

  This message is displayed in the following cases:
  - Step climb is located before the top of climb or after the top of descent
  - Step end is at less than 50 NM from top of descent. An optimum step point < 200 NM from top of descent cannot be inserted.
- “STEP NOW” if the aircraft is within 20 NM from the step point.

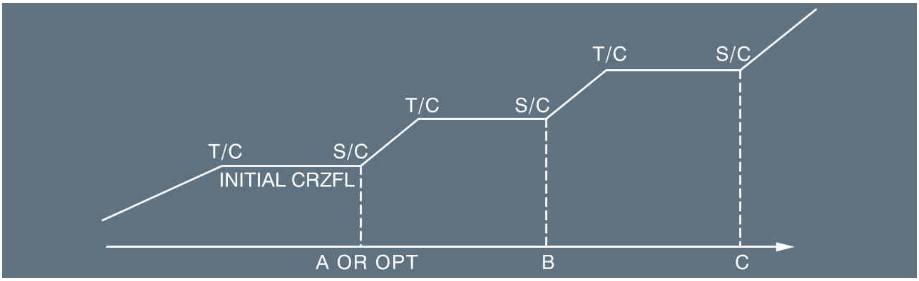
"NOT ALLOWED" may be displayed in the scratchpad if:

- Four steps already exist in the F-PLN, and an additional entry is attempted
- Any attempt to enter a step at the FROM waypoint or at a pseudo waypoint is done
- Two consecutive steps are entered at the same waypoint (e.g. step climb after step descent).

STEP CLIMB/STEP DESCENT

Ident.: DSC-22_20-60-80-00001328.0007001 / 12 APR 17
Applicable to: LV-KHT, LV-KHU

The STEP ALTS function allows to define the successive CRZ FLs and to determine the optimum position to initiate a climb from the initial (or current) CRZ FL to the next one.



PRINCIPLE

GEOGRAPHIC STEPS

Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at a geographical position, along the F-PLN.

Rules

- The minimum step size is 1 000 ft
- A Step Climb (S/C) cannot follow a Step Descent (S/D)
- A STEP is automatically cleared:
  - If the S/C (S/D) is sequenced without any level change commanded by the flight crew.
  - If the flight crew achieves a LAT REV which deletes the associated waypoint from the F-PLN
  - By EO condition.
- A STEP is manually cleared:
  - On the STEP ALTS page, by CLEARING the corresponding field
  - On the F-PLN page, by CLEARING the (S/C) (S/D) pseudo waypoint.

- A STEP entry is IGNORED if the remaining CRZ distance is less than approximately 50 NM
- When the steps are inserted in the F-PLN, they are displayed:
  - On the MCDU as (S/C), (S/D), (T/C), (T/D) pseudo waypoints
  - On the ND by associated ↗, ↘, ↘ white symbols.

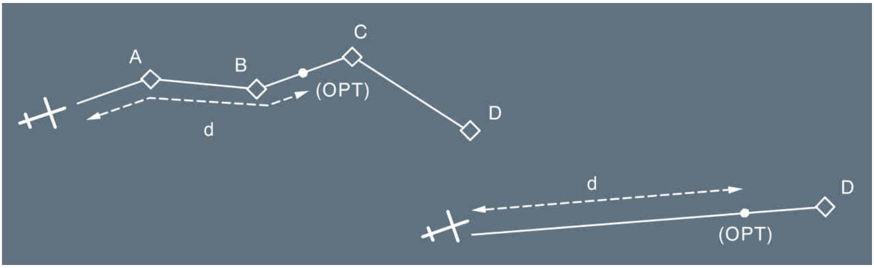
OPTIMUM STEP

When geographic steps are inserted, or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead. Predicted FUEL and TIME savings are displayed when calculated to be greater than 100 kg or 1 min respectively. If no savings are found, no optimum step is proposed.

The OPT STEP is not automatically inserted: The flight crew has to insert it if appropriate. When inserted, the OPT STEP point (OPT), is then a fixed geographical point.

If, subsequently, some F-PLN parameters are changed (winds, new waypoints, ...) an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.

When an OPT STEP is inserted in the F-PLN, and the flight crew achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN at the same distance from the aircraft position, as previously determined.



Rules

- The OPT STEP is only computed by the FM if data required for the prediction computation are inserted: F-PLN, CRZ FL, CI, GW, CG at least
- The search of the OPT STEP begins 20 NM beyond T/C before cruise, or ahead of aircraft position
- The search of the OPT STEP ends 20 NM before the next STEP POINT or 300 NM before the TOD
- Only one OPT STEP is computed at a time.

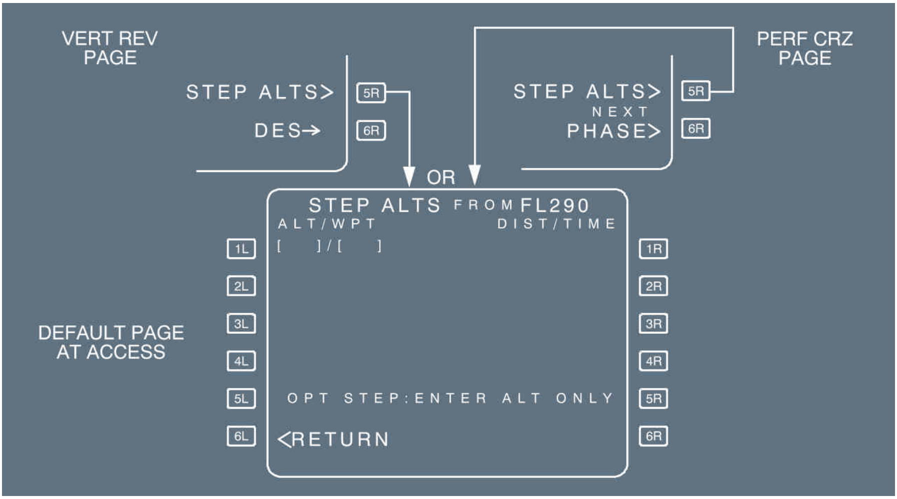
Guidance

When reaching the step point, the steps must be initiated by the flight crew by selecting the new CRZ FL and pushing the FCU ALT selector knob. If sequenced without any flight crew action, the step is automatically deleted.

If the flight crew initiates the step:
- The CRZ FL is automatically reassigned to its new value
- The guidance is THR CLB/CLB for a step climb
  THR DES/DES with V/S = -1 000 ft/min for a step descent.

STEP ENTRY

The STEP ALTS page is either accessed from the:
- VERT REV page, or
- PERF CRZ page.


VERT REV PAGE
STEP ALTS>
5R
DES→
6R
PERF CRZ PAGE
STEP ALTS>
5R
NEXT PHASE>
6R
OR
STEP ALTS FROM FL290
ALT/WPT
DIST/TIME
[ ]/[ ]
DEFAULT PAGE AT ACCESS
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
OPT STEP:ENTER ALT ONLY
<RETURN

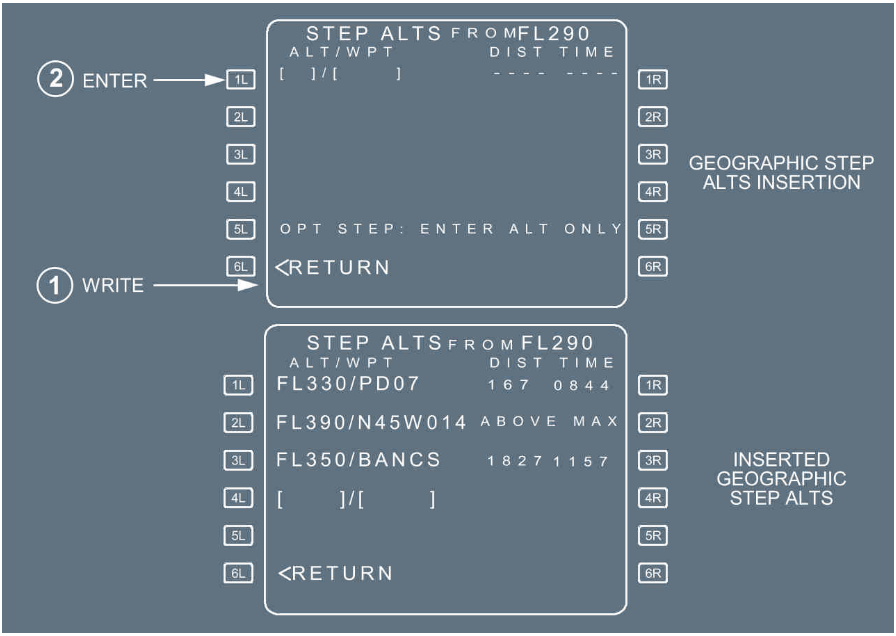
FOR GEOGRAPHIC STEP

PRESS the PERF key, or
PRESS the F-PLN key and SELECT VERT REV at a cruise waypoint
SELECT the STEP ALTS prompt.

WRITE the ALT/WPT in the scratchpad,, and ENTER it in 1L to 4L.

Note:
- *The position may be a waypoint ident, PBD, or PD*
- *The flight crew may enter FL 350/LMG/-20. The FMS will compute the geographic step 20 NM before LMG to FL 350*
- *To modify an inserted STEP:*
  - *To modify the CRZ FL only, enter it in the left key, as "FLXXX"..*
  - *To modify the position only, enter it in the left key, as "/XXX".*
  - *To modify both, modify the position first, and then the CRZ FL (it is not possible to modify both in a single entry).*

CHECK the PREDICTIONS

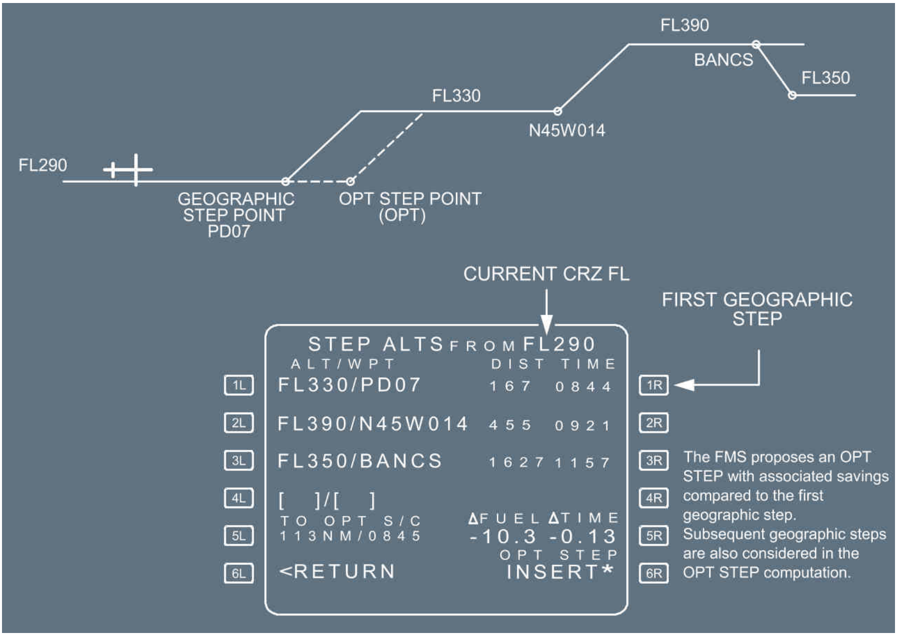


```
STEP ALTS FROM FL290
 ALT/WPT            DIST  TIME
[  ]/[      ]       ----  ----



OPT STEP: ENTER ALT ONLY
<RETURN
```

```
STEP ALTS FROM FL290
 ALT/WPT            DIST  TIME
FL330/PD07           167  0844
FL390/N45W014    ABOVE MAX
FL350/BANCS         1827  1157
[      ]/[      ]

<RETURN
```

FOR OPTIMAL STEP

When all geographical steps are inserted, and the predictions are available, the STEP ALTS page displays FUEL/TIME savings for the first step climb. If no significant savings are predicted, the NO OPTIMAL message is displayed.

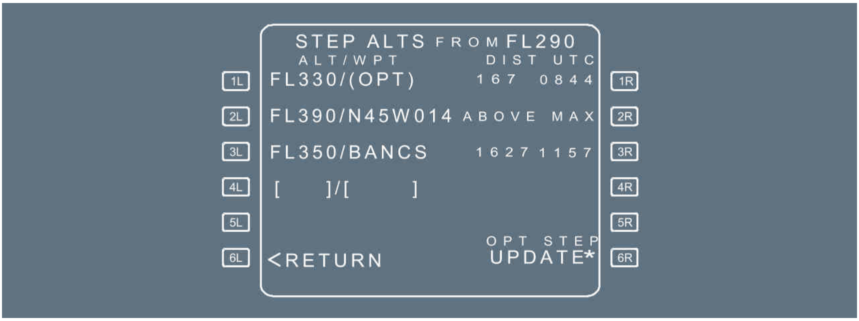

FL390
BANCS
FL350
FL330
N45W014
FL290
GEOGRAPHIC STEP POINT PD07
OPT STEP POINT (OPT)
CURRENT CRZ FL
FIRST GEOGRAPHIC STEP
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
STEP ALTS FROM FL290
ALT/WPT              DIST  TIME
FL330/PD07            167  0844
FL390/N45W014         455  0921
FL350/BANCS          1627  1157
[   ]/[   ]
TO OPT S/C         ΔFUEL ΔTIME
113NM/0845         -10.3 -0.13
                      OPT STEP
<RETURN                INSERT*
```

The FMS proposes an OPT STEP with associated savings compared to the first geographic step. Subsequent geographic steps are also considered in the OPT STEP computation.

- **To INSERT the proposed OPT STEP displayed in [5L]:**

  SELECT the INSERT* prompt in [6R]

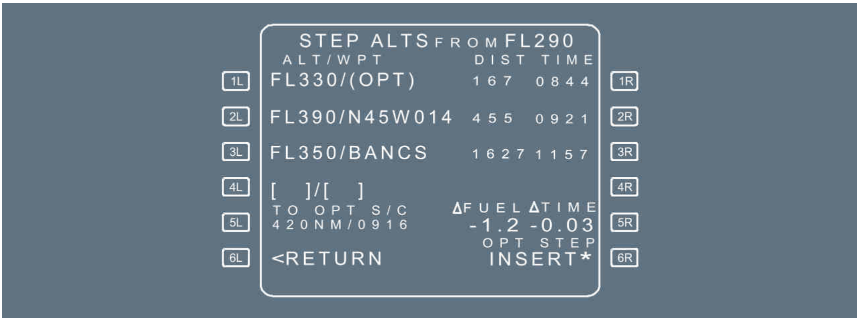

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
STEP ALTS FROM FL290
ALT/WPT              DIST  UTC
FL330/(OPT)           167  0844
FL390/N45W014    ABOVE MAX
FL350/BANCS          1627  1157
[      ]/[        ]

                      OPT STEP
<RETURN                UPDATE*
```

The computed (OPT) step replaces the initially inserted step position, and is then considered at a fixed geographic position. Savings are no longer displayed, and the UPDATE prompt replaces the INSERT prompt. This prompt allows the flight crew to update the (OPT) step position, taking into account possible F-PLN or inserted wind changes.

If pressed, a new OPT point is proposed with associated SAVINGS and INSERT prompt, or NO OPTIMAL.

UPDATE prompt has been pressed, the new OPT STEP point provides additional savings:



```
 STEP ALTS FROM FL290
  ALT/WPT            DIST TIME
FL330/(OPT)          167  0844

FL390/N45W014        455  0921

FL350/BANCS          1627 1157

[   ]/[   ]
TO OPT S/C        ΔFUEL ΔTIME
420NM/0916         -1.2 -0.03
                    OPT STEP
<RETURN             INSERT*
```

TO DETERMINE THE OPTIMAL STEP LOCATION WHEN THERE ARE ONLY 2 CRZ FLS IN THE F-PLN

The flight crew may obtain the OPT position of the STEP point, as follows:

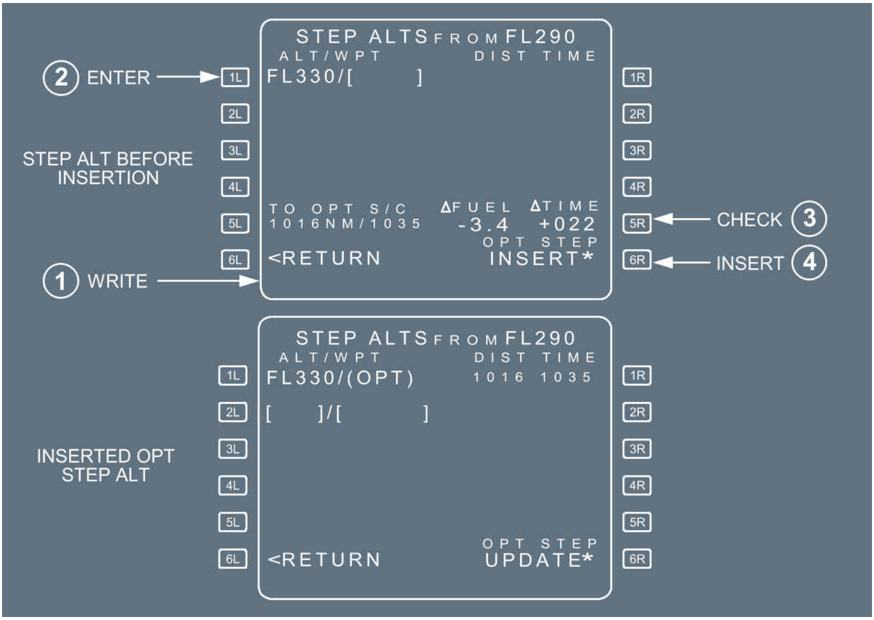
INSERT the initial cruise FL on INIT A page
ENSURE that the ZFW, ZFWCG and BLOCK fuel are inserted in INIT B page
WRITE the new CRZ FL in the STEP ALTS page, and INSERT it in the [1L] field.

Distance and time to optimum point and fuel/time saving are displayed.

CHECK the fuel and time savings and prediction in the [5R] field.

Savings are computed by comparing the entered step altitude, and the origin altitude of the step.

INSERT, if suitable.



```
STEP ALTS FROM FL290
 ALT/WPT            DIST  TIME
FL330/[      ]

TO OPT S/C        ΔFUEL  ΔTIME
1016NM/1035       -3.4   +022
                      OPT STEP
<RETURN               INSERT*
```

```
STEP ALTS FROM FL290
 ALT/WPT            DIST  TIME
FL330/(OPT)         1016  1035
[    ]/[        ]

                      OPT STEP
<RETURN               UPDATE*
```

Note: No OPT STEP is available in the SEC F-PLN.

MESSAGES

Messages may be displayed in the DIST/TIME field:

- “ABOVE MAX” if the inserted step altitude exceeds the REC MAX ALT.
  The “STEP ABOVE MAX FL” scratchpad message is associated to the “ABOVE MAX” message.
- “IGNORED”

  This message is displayed in the following cases:
  - Step climb is located before the top of climb or after the top of descent
  - Step end is at less than 50 NM from top of descent. An optimum step point < 200 NM from top of descent cannot be inserted.
- “STEP AHEAD” when the distance to the step point is less than 20 NM. A "STEP AHEAD" scratchpad message is also displayed.

“NOT ALLOWED” may be displayed in the scratchpad if:

- Four steps already exist in the F-PLN, and an additional entry is attempted
- Any attempt to enter a step at the FROM waypoint or at a pseudo waypoint is done
- Two consecutive steps are entered at the same waypoint (e.g. step climb after step descent).

GENERAL

Ident.: DSC-22_20-60-90-00001329.0002001 / 16 MAR 11
Applicable to: ALL

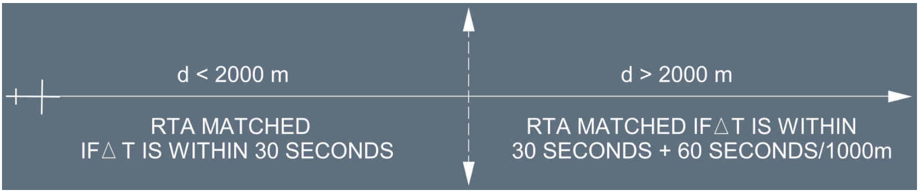
A time constraint may be assigned at any waypoint of the F-PLN, downpath of the FROM waypoint origin. It can be an ”AT”, “AT OR BEFORE”, or “AT OR AFTER” constraint.
The FM computes a new managed speed profile from the aircraft position to the constrained waypoint, in order to match the 30 s difference (ΔT) between the time predicted at the constrained waypoint and the Required Time of Arrival (RTA). This modified managed speed profile can be checked using the speed prediction, displayed for each waypoint of the F-PLN page.
The RTA function uses a speed range between Green Dot and VMO -10 (or MMO - 0.02). When the constrained waypoint is sequenced, the ECON SPD/MACH is resumed unless the constrained waypoint is located in a descent segment.

Note: 1. *The FM does not compute a new managed speed profile when a RTA is entered in the descent profile, while the aircraft is in cruise, within 40 NM from the top of descent.*
2. *The managed speed target is not modified in the climb phase to avoid changes of flight path during the climb. The managed speed profile is modified once the aircraft is in cruise phase.*

The time constraint is inserted on the RTA page. A time constraint may be inserted at any waypoint of the primary or secondary flight plan.
If an engine-out condition is detected, the time constraint is automatically deleted and an RTA DELETED message is displayed on scratchpad.
When inserted in the F-PLN, the RTA is displayed in magenta on the F-PLN page, as long as no predictions are available.

When the predictions are available, the time constraint is replaced by the new predicted time at the related waypoint, highlighted by a star (*):
- If the (*) is magenta, the time constraint is matched with the 30 s criteria
- If the (*) is amber, the time constraint is missed.

Time constraint matching criteria:


d < 2000 m
d > 2000 m
RTA MATCHED
IF△ T IS WITHIN 30 SECONDS
RTA MATCHED IF△T IS WITHIN
30 SECONDS + 60 SECONDS/1000m

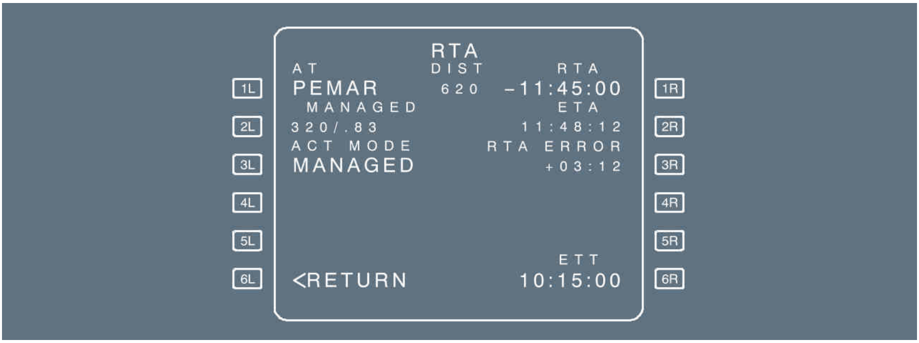
Note: *ΔT is the time difference between the time predicted at the constrained waypoint and the RTA.`*

RTA ENTRY

Ident.: DSC-22_20-60-90-00001330.0002001 / 01 OCT 12
Applicable to: ALL

PRESS the F-PLN key
SELECT vertical revision at revised waypoint
SELECT the RTA key
ENTER a waypoint at which a time constraint is to be defined
WRITE the RTA (+/– HHMMSS) into the scratchpad and ENTER by pressing the 1R key.

The display automatically reverts to the F-PLN A page.



```
                RTA
 AT             DIST          RTA
PEMAR            620    -11:45:00
  MANAGED                     ETA
320/.83                  11:48:12
ACT MODE                RTA ERROR
MANAGED                    +03:12



                              ETT
<RETURN                  10:15:00
```

Note:
- *The RTA can be cleared directly on the F-PLN A page using the CLR key.*
- *If a time constraint is inserted in the F-PLN, the OPT STEP function is no longer available. Therefore, if an OPT is to be inserted in the F-PLN, this shall be done before entering the RTA.*
- *The time constraint is automatically deleted in the following cases:*
  - *Engine Out, or*
  - *When entering a holding pattern, or*
  - *In case of go-around, or*
  - *A time constraint is entered at another waypoint while another time constraint already exists.*

In case a time constraint is deleted, the “RTA DELETED” scratchpad message is displayed.

ESTIMATED TAKEOFF TIME

Ident.: DSC-22_20-60-90-00001331.0001001 / 16 MAR 11
Applicable to: ALL

The Estimated Takeoff Time (ETT) may be entered by the pilot during the preflight phase at the origin airport. This time is used as the initialization time for predictions.
The entry is accepted in the preflight phase, if the ETT is greater than the clock time.

PROCEDURE

PRESS the F-PLN key.
SELECT a vertical revision at origin
SELECT the RTA page ◁*
WRITE the ETT into the scratchpad, and ENTER it in the UTC CSTR (ETT ◁*) field.
The display automatically reverts to the F-PLN A page.

Note:
- *If the current time exceeds the ETT entry, the CLK IS TAKE OFF TIME message is displayed ; the ETT is replaced by the clock time*
- *At takeoff, the takeoff time is automatically updated using the actual clock time*
- *An ETT entry is automatically deleted, if the origin airport is modified, or if the clock is inoperative*
- *If a time constraint is entered at a waypoint in the F-PLN, the takeoff time required to match the constraint is automatically computed by the FM. This result is displayed in magenta as ETT at the origin.*

USE OF TIME/ETT CSTR

During preflight :
- If an ETT has been entered, time predictions are based on the entered value (or clock time, if greater)
- If both an ETT and a time constraint have been entered, time predictions are based on the entered ETT value (or clock time, if greater). The managed speed profile is computed to match the time constraint, as closely as possible, using a pseudo cost index value. (Not displayed)
- If only a time constraint has been entered:
  - Optimum speeds are computed to determine the ETT, so as to satisfy the time constraint.
  - If necessary, flight time (based on optimum speeds) plus clock time (current) is greater than the time constraint. Optimum speeds are modified to match the time constraint as closely as possible.

After Takeoff : The predictions are based on the current time.
Speeds are adjusted to satisfy the time constraint.

Intentionally left blank

GENERAL

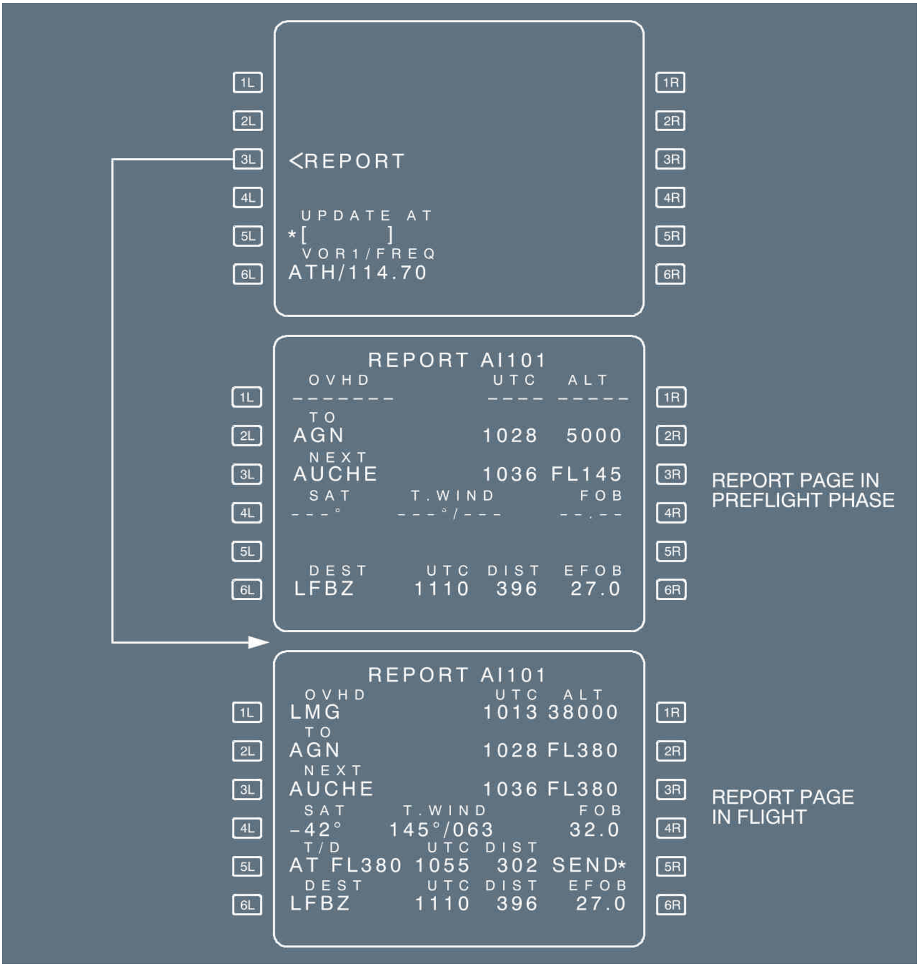
Ident.: DSC-22_20-60-100-00001332.0001001 / 16 MAR 11
Applicable to: ALL

The REPORT page allows the crew to achieve the position reporting.
It is tailored for Long-Range or oceanic flights, where a more complete report is required due to the lack of radar facility, and due to the potential requirement by ATC for specific weather data report.

REPORT PAGE ACCESS

Ident.: DSC-22_20-60-100-00001333.0001001 / 14 MAY 12
Applicable to: LV-GKO, LV-GKP

The report page is accessed from the PROG PAGE.



```
<REPORT

 UPDATE AT
*[         ]
 VOR1/FREQ
ATH/114.70
```

```
       REPORT AI101
 OVHD           UTC   ALT
--------        ----  -----
 TO
AGN             1028   5000
 NEXT
AUCHE           1036  FL145
 SAT      T.WIND        FOB
---°     ---°/---     --.--

 DEST      UTC  DIST   EFOB
LFBZ      1110   396   27.0
```

REPORT PAGE IN PREFLIGHT PHASE

```
       REPORT AI101
 OVHD           UTC   ALT
LMG             1013 38000
 TO
AGN             1028 FL380
 NEXT
AUCHE           1036 FL380
 SAT      T.WIND        FOB
-42°     145°/063      32.0
 T/D       UTC  DIST
AT FL380  1055   302  SEND*
 DEST      UTC  DIST   EFOB
LFBZ      1110   396   27.0
```

REPORT PAGE IN FLIGHT

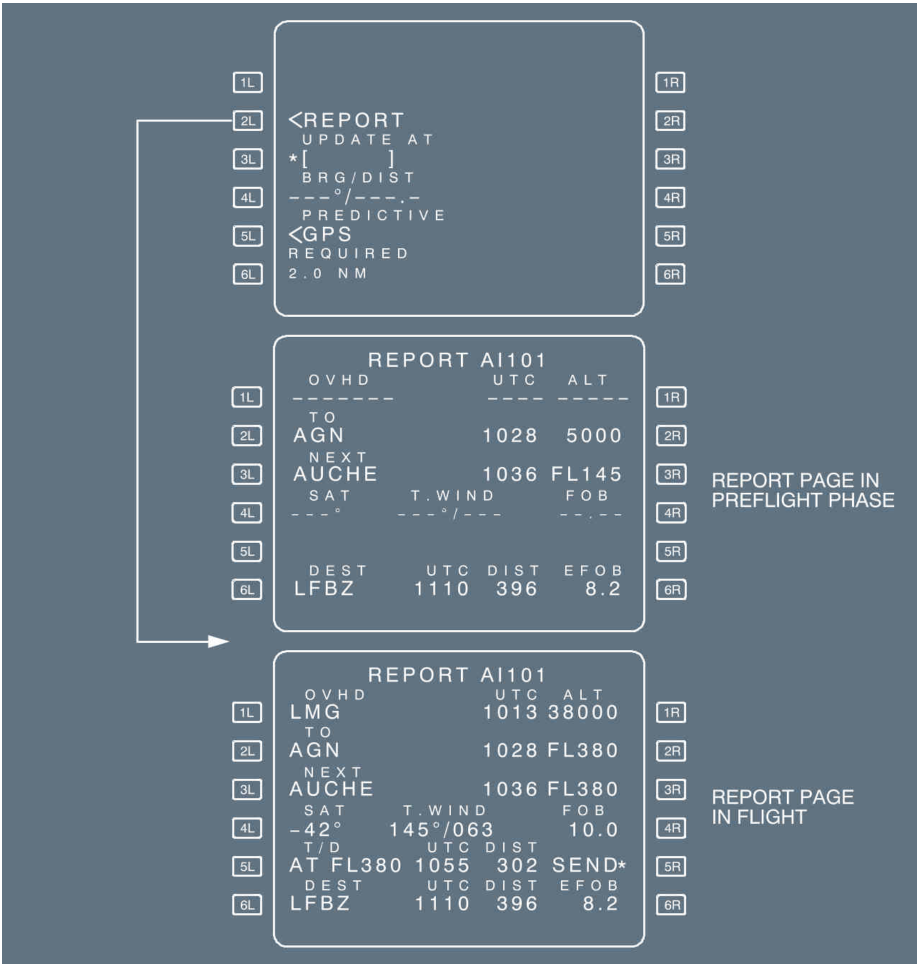
<u>Note:</u> *In case a DIR TO with ABEAM WPTs is achieved, or in case a RADIAL FIX INFO with ABEAM or RADIAL intersection is inserted in the F-PLN, the TO WPT provided on the REPORT page will be the ABEAM WPT or the RADIAL intersect waypoint, if any, as on the F-PLN page.*

REPORT PAGE ACCESS

Ident.: DSC-22_20-60-100-00001333.0004001 / 01 OCT 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The report page is accessed from the PROG PAGE.



```
<REPORT
 UPDATE AT
*[       ]
 BRG/DIST
---°/----.-
 PREDICTIVE
<GPS
REQUIRED
2.0 NM
```

```
        REPORT AI101
 OVHD                 UTC   ALT
--------              ----  -----
 TO
AGN                   1028  5000
 NEXT
AUCHE                 1036 FL145
 SAT       T.WIND          FOB
---°       ---°/---        --.--


 DEST        UTC  DIST    EFOB
LFBZ        1110  396      8.2
```

REPORT PAGE IN PREFLIGHT PHASE

```
        REPORT AI101
 OVHD                 UTC   ALT
LMG                   1013 38000
 TO
AGN                   1028 FL380
 NEXT
AUCHE                 1036 FL380
 SAT      T.WIND          FOB
-42°     145°/063         10.0
 T/D            UTC  DIST
AT FL380  1055  302  SEND*
 DEST           UTC  DIST  EFOB
LFBZ           1110  396    8.2
```

REPORT PAGE IN FLIGHT

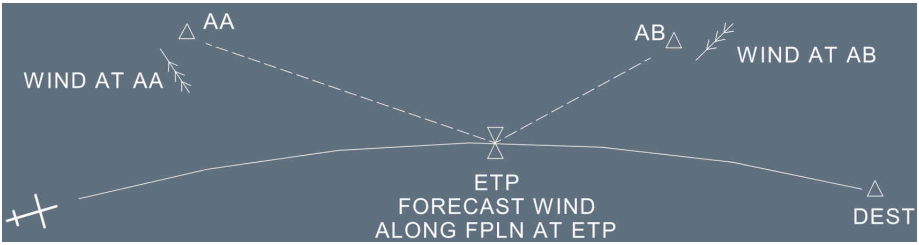
Note: *In case a DIR TO with ABEAM WPTs is achieved, or in case a FIX INFO with ABEAM or RADIAL/CIRCLE intersection is inserted in the F-PLN, the TO WPT provided on the REPORT page will be the ABEAM WPT or the RADIAL/CIRCLE intersect waypoint, if any, as on the F-PLN page.*

EQUITIME POINT

Ident.: DSC-22_20-60-110-00001334.0001001 / 01 APR 11
Applicable to: ALL

The EQUITIME POINT page displays the Equitime Point (ETP) computed along the F-PLN route between two referenced positions (airports, waypoints or NAVAIDs) defined by the flight crew (Refer to DSC 22_20 Auto Flight - Flight Management / 50 Controls and Indicators / 10 MCDU - Page Description).
At the first access to the page, the FM proposes origin and destination airports as defaulted positions.
The flight crew may overwrite these two positions and insert the wind in their vicinity at the applicable CRZ FL.
The FM then computes the resulting ETP, using the managed or selected speed and blending the forecasted winds along the F-PLN route with the inserted winds.

The FM provides :
- TIME and DIST from aircraft position (or origin on ground) to ETP
- The BRG/DIST from ETP to the defined positions
- TIME overhead each position, assuming the aircraft flies from present position to the defined position via the ETP
- (ETP) pseudo waypoint is displayed on the ND along the F-PLN.
- ETP location with regard to the subsequent waypoint.



ETP ENTRY

Ident.: DSC-22_20-60-110-00001335.0001001 / 16 MAR 11
Applicable to: ALL

PRESS the DATA key
SELECT the EQUITIME POINT prompt.

The EQUITIME POINT page is displayed. The origin and destination airports are used by default.

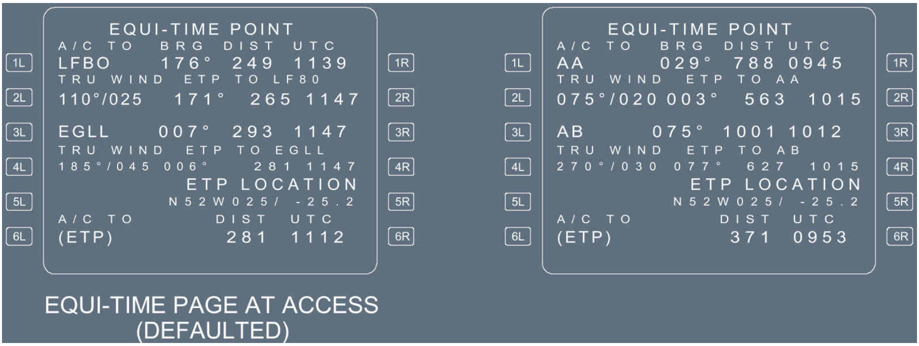
ENTER the REF POINT 1 in the 1L field.

ENTER the associated wind in the 2L field.

The wind to be inserted is the wind in the vicinity of the reference point at the CRZ FL.

ENTER the REF POINT 2 in the 3L field.
ENTER the associated wind in the 4L field.

The system displays the ETP location with regards to the next waypoint of the active flight plan following the ETP in the 5R field, and the A/C TO (ETP) predictions in the 6R field.



```
    EQUI-TIME POINT
A/C TO      BRG   DIST  UTC
LFBO        176°  249   1139
TRU WIND    ETP TO LF80
110°/025    171°  265   1147

EGLL        007°  293   1147
TRU WIND    ETP TO EGLL
185°/045    006°  281   1147
                ETP LOCATION
             N52W025/  -25.2
A/C TO            DIST  UTC
(ETP)             281   1112
```

```
    EQUI-TIME POINT
A/C TO      BRG   DIST  UTC
AA          029°  788   0945
TRU WIND    ETP TO AA
075°/020    003°  563   1015

AB          075°  1001  1012
TRU WIND    ETP TO AB
270°/030    077°  627   1015
                ETP LOCATION
             N52W025/  -25.2
A/C TO            DIST  UTC
(ETP)             371   0953
```

EQUI-TIME PAGE AT ACCESS
(DEFAULTED)

<u>Note:</u>
- *The ETP pseudo waypoint is not displayed on the MCDU F-PLN page. In order to locate it easily, or when closing up the applicable ETP, the TIME MARKER may be used. This allows the flight crew to visualize ETP pseudo waypoint in advance on the F-PLN page or to prepare the next applicable ETP on the EQUITIME POINT page.*
- *The ETP is computed using speed according to current mode (managed or selected).*

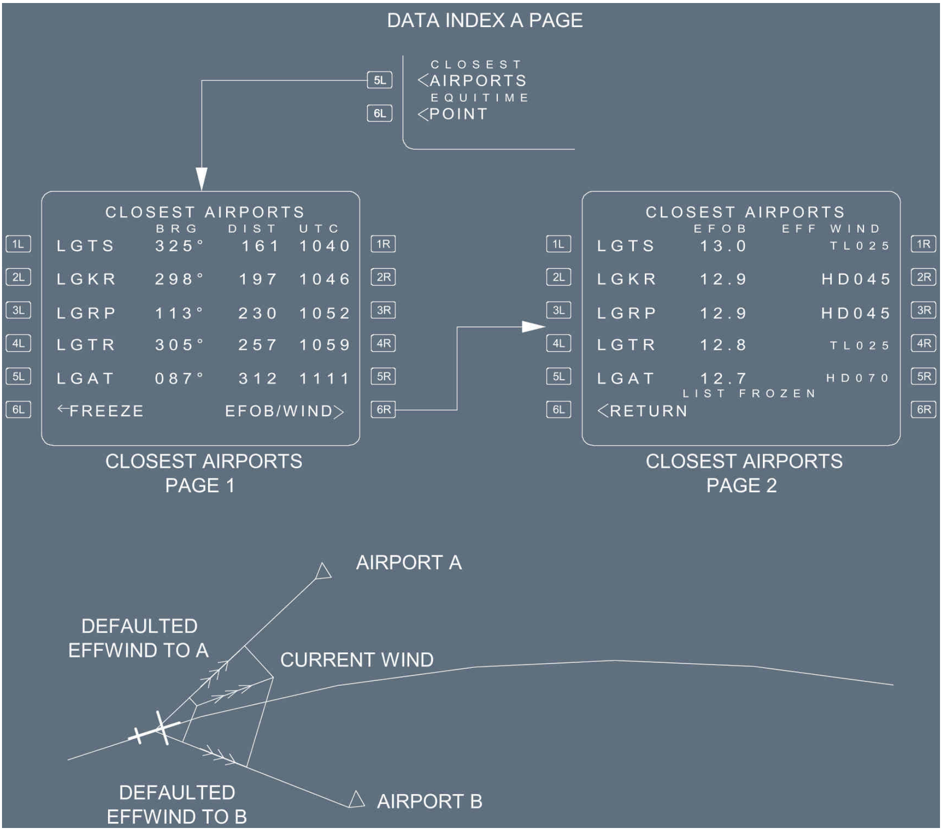
CLOSEST AIRPORTS

Ident.: DSC-22_20-60-110-00001336.0001001 / 01 APR 11
Applicable to: ALL

The CLOSEST AIRPORT page displays the 4 closest airports from the aircraft position found in the navigation database (Refer to DSC 22_20 Auto Flight - Flight Management / 50 Controls and Indicators / 10 MCDU - Page Description) and the fifth airport, as selected by the flight crew.

For each airport, the FM computes :

- The BRG/DIST/ESTIMATED UTC from aircraft position to the corresponding airport
- The EFOB at the airport, assuming an EFFECTIVE WIND (defaulted or entered by the flight crew).


DATA INDEX A PAGE
5L
6L
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CURRENT WIND
DEFAULTED EFFWIND TO A
AIRPORT A
DEFAULTED EFFWIND TO B
AIRPORT B

CLOSEST
<AIRPORTS
EQUITIME
<POINT

CLOSEST AIRPORTS

	BRG	DIST	UTC
LGTS	325°	161	1040
LGKR	298°	197	1046
LGRP	113°	230	1052
LGTR	305°	257	1059
LGAT	087°	312	1111
←FREEZE		EFOB/WIND>	

CLOSEST AIRPORTS PAGE 1

CLOSEST AIRPORTS

	EFOB	EFF WIND
LGTS	13.0	TL025
LGKR	12.9	HD045
LGRP	12.9	HD045
LGTR	12.8	TL025
LGAT	12.7	HD070

LIST FROZEN
<RETURN

CLOSEST AIRPORTS PAGE 2

Note: *When CLOSEST AIRPORTS, page 2, is selected, the list of airports is automatically frozen, as indicated on the page.*

The FUEL/TIME predictions to the closest airports use simplified assumptions :

- Manage speed profile in cruise, with the effective wind from the CLOSEST AIRPORT page 2. In case of EO, Engine Out condition is considered.
- Continuous descent from CRZ FL down to the airport elevation.

Note: *In case SELECTED SPD is used, the CLOSEST AIRPORT page still provides good use to choose the applicable closest airport for diversion purposes. However, when SELECTED SPD is significantly different from MANAGED SPD, the predictions in terms of time and fuel must be disregarded since they are misleading.*
The predictions may then be checked on the SEC F-PLN.

HOW TO EXECUTE A DIVERSION

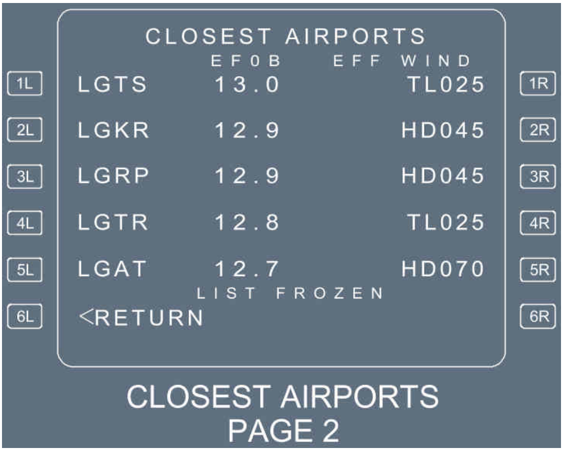
Ident.: DSC-22_20-60-110-00001337.0001001 / 10 DEC 09
Applicable to: ALL

Various features are provided to the flight crew in order to execute a diversion :
- The EQUITIME POINT
- The CLOSEST AIRPORTS page
- The SECONDARY F-PLN
- The ENABLE ALTN function
- The NEW DEST revision.

EN ROUTE DIVERSION WITH SEVERAL AIRPORTS AVAILABLE

Ident.: DSC-22_20-60-110-00001338.0001001 / 10 DEC 09
Applicable to: ALL

SELECT the CLOSEST AIRPORTS page.


```
        CLOSEST AIRPORTS
              EFOB     EFF  WIND
LGTS          13.0           TL025
LGKR          12.9           HD045
LGRP          12.9           HD045
LGTR          12.8           TL025
LGAT          12.7           HD070
            LIST FROZEN
<RETURN
```

CLOSEST AIRPORTS
PAGE 2

SELECT the EFOB/WIND prompt.
INSERT the effective wind at selected airport.
CHECK the predictions and CHOOSE the adequate diversion airport.

PREPARE the diversion flight plan on the secondary flight plan.

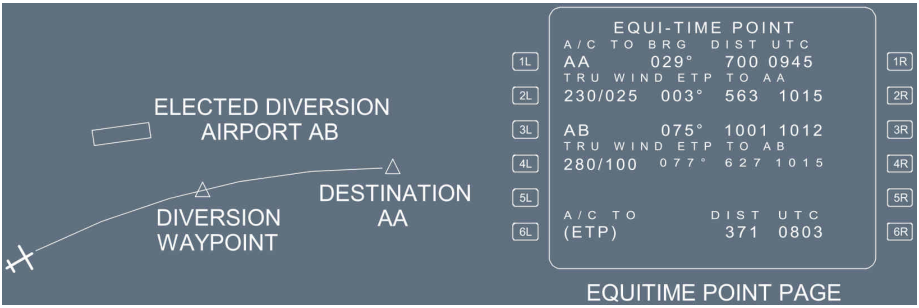
Note: *Fuel/time predictions on CLOSEST AIRPORTS page assume managed speed profile.*

EN ROUTE DIVERSION OVER OCEANIC OR DESERTIC AREA

Ident.: DSC-22_20-60-110-00001342.0001001 / 10 DEC 09
Applicable to: ALL

The diversion airports are usually determined prior to departure or using the CLOSEST AIRPORT DATA.

SELECT the EQUITIME POINT page.



```
       EQUI-TIME POINT
A/C  TO  BRG    DIST  UTC
AA       029°    700 0945
TRU  WIND  ETP  TO  AA
230/025   003°   563  1015

AB        075°   1001 1012
TRU  WIND  ETP  TO  AB
280/100   077°   627  1015


A/C  TO          DIST  UTC
(ETP)             371  0803
```

EQUITIME POINT PAGE

ENTER the airport idents in the 1L and 3L fields.
ENTER the associated winds in the 2L and 4L fields.
CHECK the ETP position and time.
ENTER a predicted time at ETP as a time marker.
PREPARE a diversion flight plan on the secondary flight plan.

DIVERSION PREPARATION ON THE SECONDARY FLIGHT PLAN

Ident.: DSC-22_20-60-110-00001343.0001001 / 16 MAR 11
Applicable to: ALL

This procedure shall be applied for all diversion cases, when the diversion airport has been selected, and when the “most probable diversion point of the F-PLN” has been selected.

SELECT the “SEC F-PLN” key.
PRESS the “COPY ACTIVE” prompt.
SELECT a lateral revision at diversion waypoint.

ENTER the ident of the diversion airport as the new destination (NEW DEST field).

Then finalize the flight plan between the diversion point and the diversion airport. If the diversion airport is no longer applicable or the ETP is sequenced, repeat the same procedure for the next diversion airport.

MISCELLANEOUS

Ident.: DSC-22_20-60-110-00001344.0001001 / 17 MAR 11
Applicable to: ALL

In certain cases, the diversion airport may be simply chosen using the airports displayed on ND having selected AIRPORT on the EIS control panel.

During oceanic or desertic area flights, the PROG page may be advantageously used as follows :

ENTER the ident of the diversion airport in the 4R field of MCDU 1.
ENTER the next diversion airport in the 4R field of MCDU 2.

The flight crew is then continuously provided with the instantaneous BRG/DIST to the selected diversion airports.

UPDATE the PROG pages when sequencing the ETP.

EXECUTION OF THE DIVERSION

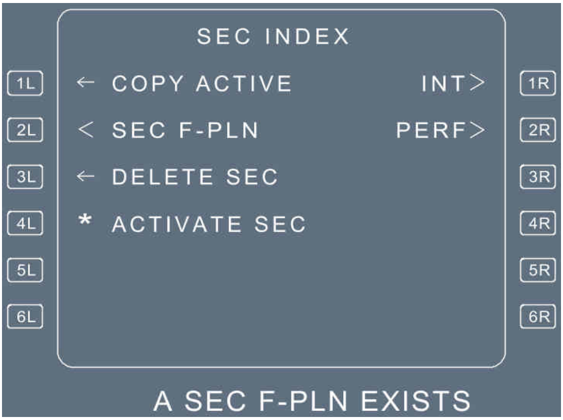
Ident.: DSC-22_20-60-110-00001345.0001001 / 10 DEC 09
Applicable to: ALL

- **When the flight crew decides to divert :**

  PRESS the SEC F-PLN key.

  SELECT the ACTIVATE SEC prompt.

SELECT DIR TO required point.



SEC INDEX

← COPY ACTIVE INT>

< SEC F-PLN PERF>

← DELETE SEC

* ACTIVATE SEC

A SEC F-PLN EXISTS

DIVERSION TO THE ALTERNATE AIRPORT

Ident.: DSC-22_20-60-110-00001346.0001001 / 24 NOV 23

Applicable to: ALL

The primary F-PLN includes an alternate flight plan from destination to the preferred alternate airport. All fuel prediction and management (XTRA fuel) take into consideration the alternate flight plan.
If the crew decides to divert at the end of the cruise, or beyond the last ETP, or in descent or Go-around phases, this will be done most probably to the alternate airport.

- **When the crew decides to divert :**

  SELECT a lateral revision at suitable waypoint

  SELECT ENABLE ALTN

  CHECK the temporary flight plan and INSERT.

  SELECT DIR TO required waypoint.

  Note:
  - *In most cases the LAT REV shall be selected at the TO WPT. This will facilitate the subsequent selection of the DIR TO waypoint.*
  - *The ALTN flight plan shall be finalized whenever the landing runway is known by the crew (before arrival briefing).*
    This will ensure, in most cases, to have the most probable flight plan displayed on the MCDU once ENABLE ALTN is selected.

Intentionally left blank

IRS ALIGNMENT

Ident.: DSC-22_20-60-120-00001347.0001001 / 21 MAR 17
Applicable to: ALL

IRSs will be aligned, as per the recommendations in the SOP chapter (*Refer to PRO-NOR-SOP-04 ADIRS*).

F-PLN INSERTION AND CROSSCHECK

Ident.: DSC-22_20-60-120-00001348.0001001 / 16 MAR 11
Applicable to: ALL

On certain routes, the pilot has to define LAT/LONG waypoints, which must be entered as follows:

WRITE the waypoint longitude/latitude in the scratchpad.

The format is 4500N/3000W.

PRESS a left key of the MCDU F-PLN page.

This automatically triggers the NEW WAYPOINT page.

CHECK the coordinates and the proposed waypoint ident.

If the pilot entered 4500N/3000W, the system proposes the ident N45W030.

PRESS the STORE prompt.

The waypoint is inserted in the F-PLN, and stored in the navigation database (stored element).

A F-PLN crosscheck must be carefully performed by both crewmembers:

- *Check the SID (F-PLN page and ND PLAN mode versus the SID chart including constraints)*
- *En route segments:*
  - *If the F-PLN is defined by a company route: Check the ROUTE SELECTION page, versus the ATC F-PLN.*
  - *If the F-PLN is defined by a succession of airways: Check the AWY intersect waypoints on the AWY page, versus the ATC F-PLN.*
  - *If the F-PLN is defined by a succession of waypoints: Check the TRK/DIST of each leg, versus the computerized F-PLN.*
- *Check the flight plan DISTANCE on the F-PLN page, versus the ground distance of the computerized flight plan*
- *Once the flight plan is finalized, and all GW/PERF data are inserted:*
  - *PRINT the PREFLIGHT REPORT*
    This report may then be used as the master document for the continuous monitor of the flight progress, until a major flight plan change will occur in flight.

IN FLIGHT PROCEDURES

Ident.: DSC-22_20-60-120-00001351.0001001 / 23 DEC 14
Applicable to: ALL

TAKEOFF

If takeoff is achieved from an intersection, INSERT the corresponding TO SHIFT on the PERF TO page, to get an accurate position update at takeoff.

REACHING THE INITIAL CRUISE FL

COMPLETE WIND/TEMP entry at waypoints, if not done during preflight
COMPLETE STEP entry, check whether an OPT STEP is proposed for the next STEP on the STEP ALT page
UPDATE the F-PLN with the latest ATC or Oceanic clearance
PRINT the resulting predictions (if PRINTER is installed) : PRINT the INFLIGHT REPORT

This will be then used as the basic document to follow the proper completion of the flight, until a new major change is requested by ATC.

BEFORE LEAVING RADIO NAVAID COVERAGE

TUNE the last NAVAID within range and INSERT its ident on PROG page.

- **When IRS ONLY NAVIGATION message comes up :**
  VALIDATE FMS position (raw data versus computed BRG/DIST on PROG page)
  - **If a significant deviation is noticed between the IRS deviations :**
    Determine the best 2 IRSs on DATA POS MONITOR page

    eg
    IRS1 IRS 2 IRS3
    6.4 2.8 2.5 IRS 3/IRS2 are best.

OUTSIDE RADIO NAVAID COVERAGE

USE NAV mode.
KEEP FD bars displayed on both PFD.

Any FMS position mismatch is immediately detected by the FD bars of the slave FMS, which will not be properly centered.

When close to the TO waypoint : SELECT the report page
When overhead the waypoint, CHECK the proper sequencing :

- *REPORT to ATC using REPORT page*
- *CHECK BRG/DIST to the new TO WPT on the ND*
- *CHECK Fuel and Xtra on FUEL PRED page*

MODIFICATION OF THE F-PLN

PM : ENTERS the new clearance in the MCDU
PF/PM : CROSSCHECK the correct insertion of the new clearance
PRINT the resulting predictions (PRINTER <*) : INFLIGHT REPORT

The previous print may be suppressed since the new print includes the history of the past waypoints.

WHEN BACK INTO RADIO NAVAID COVERAGE AREA

Manually TUNE for display the first navaid potentially in range

Note: *Autotune of the navaid will only occur when within the figure of merit of the navaids.*

CROSSCHECK FMS accuracy whenever raw data are available

Note: *If a VOR/DME update occurs, it is quite common to note that the aircraft enters a shallow turn to slowly catch up the new radio position.*

AT THE END OF THE FLIGHT

PRINT the POST FLIGHT REPORT (if the PRINTER is installed).

Note: *When taxiing, the GS information provided by the worst IRS might be misleading*

CHECK the IRS drift on the POST FLIGHT REPORT or on the IRS MONITOR page (if printer is not installed)

Intentionally left blank

GENERAL

Ident.: DSC-22_20-60-130-00001352.0001001 / 22 MAR 16
Applicable to: ALL

When a flight is scheduled to cross high latitude areas (beyond 60 °), the flight crew must take various precautions regarding ADIRSs, FMGESs, and EIS.

These precautions are based on:
- The change from the MAG to TRUE heading (track) reference, due to the airway reference changes in high latitude, or due to the IRSs unable to provide magnetic heading.
- Some particularities due to the pole overfly.

DESCRIPTION

Ident.: DSC-22_20-60-130-A-00001353.0001001 / 27 MAY 13
Applicable to: ALL

MAG-TRUE REFERENCE SELECTION:

The MAG/TRUE selection is achieved manually by pressing the NORTH REF pb.

Note: *1. All airfields where STARs and APPRs are MAG referenced — such as Svalbard — will be flown with magnetic reference selected.*
2. Although located outside the above polar zone, Thule is "TRUE" oriented.

Ident.: DSC-22_20-60-130-A-00001354.0002001 / 03 NOV 21
Applicable to: ALL

FMGES

- Flight Guidance part
  - When the flight crew manually changes the heading reference from MAG to TRUE or vice versa:
    - If NAV mode is engaged, there is no discontinuity in the lateral guidance
    - If HDG (TRK) modes are engaged, the HDG (TRK) target is automatically modified using current position variation; thus there is no discontinuity in the lateral guidance.
  - When TRUE reference is selected, only CAT I ILS approaches may be flown.
- Flight Management part
  - When the aircraft reaches 78 N (60 S), the aircraft position is computed using XYZ earth centered Cartesian coordinates.
    This allows the FM to continuously provide, regardless of latitude, a MIX IRS position, the FM position being linked to the MIX IRS one.
  - During preflight phase, if TRUE reference is selected (take off with TRUE reference is rare), the pilot is reminded of this selection by:
    - CHECK NORTH REF message on ND and MCDU scratchpad if the origin airport reference does not match the one selected by the pilot
    - TRUE label above PFD/ND heading scales flashes for 10 s at slat extension
    - TRUE NORTH REF memo message flashes for 10 s at engine start or at slat extension.
  - Before approach, the flight crew is reminded of the correct TRUE/MAG selection by:
    - CHECK NORTH REF message on ND and MCDU scratchpad if the destination airport reference in data base does not match the one selected by the flight crew and the aircraft reaches the arrival area (approximately 25 NM from destination airport)
    - If true is selected, TRUE label pulses on PFD/ND during 10 s at slat extension, as well as the TRUE NORTH REF message on ECAM (as a reminder).

    Note: *If the flight crew selects TRUE reference whereas the selected approach is defined in MAG reference in the FM navigation data base, the NAV mode will disengage at the entry into the approach procedure.*

  - The tracks and bearings, provided on the MCDU F-PLN, PROG, etc. pages are computed TRUE or MAG referenced, according to the TRUE/MAG cockpit selection
    - If selection is TRUE, the bearing and track figures are displayed followed by a T.
  - If the flight crew wishes to create a PBD or a PB/PB waypoint or define a radial (DIR TO INTCPT), the rule for bearing or radial entry is as follows:
    - If the bearing is inserted without specifying its reference, the reference is the one corresponding to the cockpit selection

- If the bearing is inserted with its specified reference (M for magnetic, T for true), the bearing is so defined : e.g. TOU/350T/15.

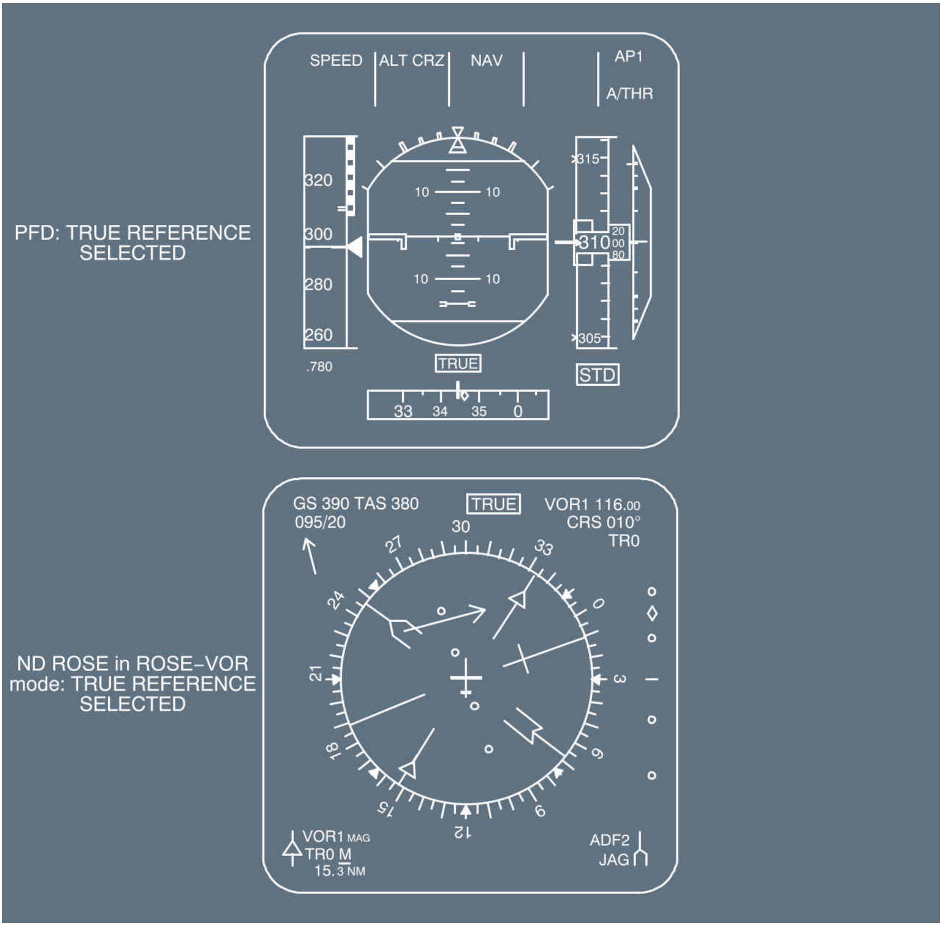
Ident.: DSC-22_20-60-130-A-00001355.0003001 / 27 MAY 13
Applicable to: ALL

EIS PFD/ND

TRUE/MAG REFERENCE INDICATION

The TRUE/MAG reference selection is indicated by a specific label displayed above the heading scales of both EFIS DUs:

- If MAG is selected (which is the most common situation) no label is provided ; the bearing to the TO waypoint on the ND is displayed with the digits only.
- If true is selected, a TRUE label is provided above PFD/ND heading scales.

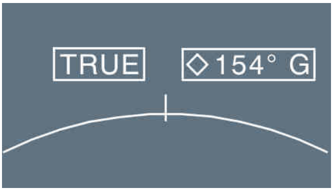


PFD: TRUE REFERENCE SELECTED

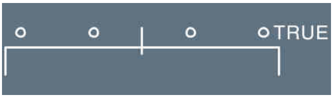
ND ROSE in ROSE–VOR mode: TRUE REFERENCE SELECTED

SPEED
ALT CRZ
NAV
AP1
A/THR
320
300
280
260
.780
10
10
10
10
315
310
20
00
80
305
TRUE
STD
33
34
35
0
GS 390 TAS 380
095/20
TRUE
VOR1 116.00
CRS 010°
TR0
30
27
33
24
0
21
3
18
6
15
12
9
VOR1 MAG
TR0 M
15.3 NM
ADF2
JAG

- The GRID TRACK appears on the ND in all modes except in PLAN mode if no approach title is displayed.



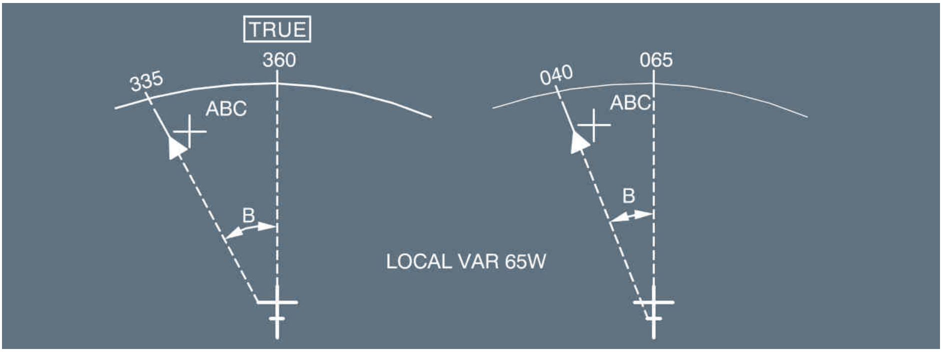
Note: *If the ILS scale is displayed on PFD, the TRUE message is shifted on the right side.*



Ident.: DSC-22_20-60-130-A-00001356.0005001 / 01 OCT 12
Applicable to: LV-GKO, LV-GKP

ADF AND VOR BEARING DISPLAY

- The ADF relative bearing information (B) is thus independant of the TRUE/MAG selection, and the needle is always pointing to the same direction whatever is the selection.
  Furthermore (provided FM position is accurate) when the EFIS ND is in ARC or ROSE NAV modes, the ADF needle will point towards the NDB symbol as provided by the FMS.



Note: *the same reading is available on the DDRMI.*

- The VOR bearing is measured by the VOR, at the VOR location:
  - it is a TRUE bearing, if the VOR station is TRUE-referenced.
  - it is a MAG bearing, if the VOR station is MAG-referenced.

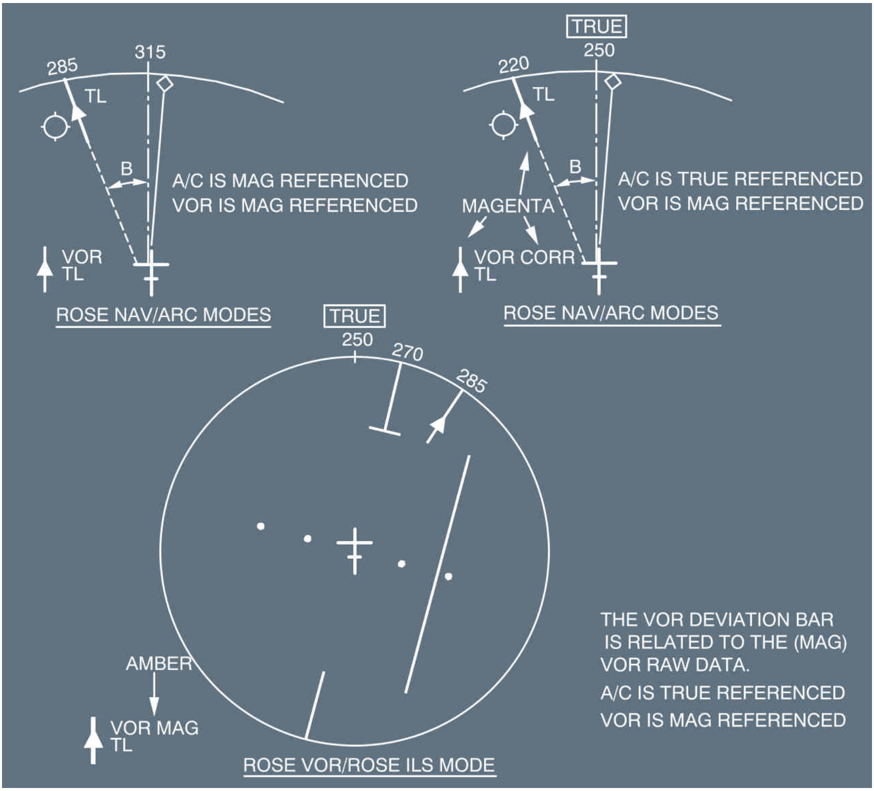
  When the ND display mode is ARC or ROSENAV, the FM-computed data (aircraft position, F-PLN legs, NAVAID position symbol...) are provided along with VOR needles, if selected.

  → it is important, in these display modes, that the FM data and the VOR raw data be consistent.
  Hence, if the cockpit NORTH REF selection does not match the VOR station reference, there may be a discrepancy between the VOR raw data and the FM data, unless a correction is applied to the VOR data.

PRINCIPLE

When the ND is in ARC/ROSE NAV mode, if there is a mismatch between the NORTH REF selection and the VOR station reference, the VOR needle is equal to the VOR raw bearing corrected by the local variation at the aircraft's present position.
In that case, the needle is displayed in magenta colour, the label CORR (corrected) is displayed in magenta in the lower corner of the ND.
In all other ND display modes (ROSE VOR, ROSE ILS), the VOR raw data (with no correction) is displayed. MAG or TRUE (amber) is displayed next to the VOR identifier, when its reference does not match the cockpit selection.

EXAMPLE	Local variation 65W – TL is a magnetic referenced VOR.


285
315
TL
B
A/C IS MAG REFERENCED
VOR IS MAG REFERENCED
VOR
TL
ROSE NAV/ARC MODES
TRUE
250
220
TL
B
MAGENTA
A/C IS TRUE REFERENCED
VOR IS MAG REFERENCED
VOR CORR
TL
ROSE NAV/ARC MODES
TRUE
250
270
285
AMBER
VOR MAG
TL
ROSE VOR/ROSE ILS MODE
THE VOR DEVIATION BAR
IS RELATED TO THE (MAG)
VOR RAW DATA.
A/C IS TRUE REFERENCED
VOR IS MAG REFERENCED

VOR transmitter Reference	ND display MODE	Cockpit Reference Selection		DDRMI
		TRUE	MAG	
TRUE	ARC/ROSE NAV	VOR Raw data	VOR is corrected	VOR RAW DATA
	ROSE VOR/ILS	VOR RAW DATA		
MAG	ARC/ROSE NAV	VOR is corrected	VOR Raw Data	
	ROSE VOR/ILS	VOR RAW DATA		

Note: *ND in ROSE VOR/ROSE ILS modes and DDRMI VOR bearing indications are always identical.*

Ident.: DSC-22_20-60-130-A-00001356.0007001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

VOR BEARING DISPLAY

The VOR bearing is measured by the VOR, at the VOR location:
- it is a TRUE bearing, if the VOR station is TRUE-referenced.
- it is a MAG bearing, if the VOR station is MAG-referenced.

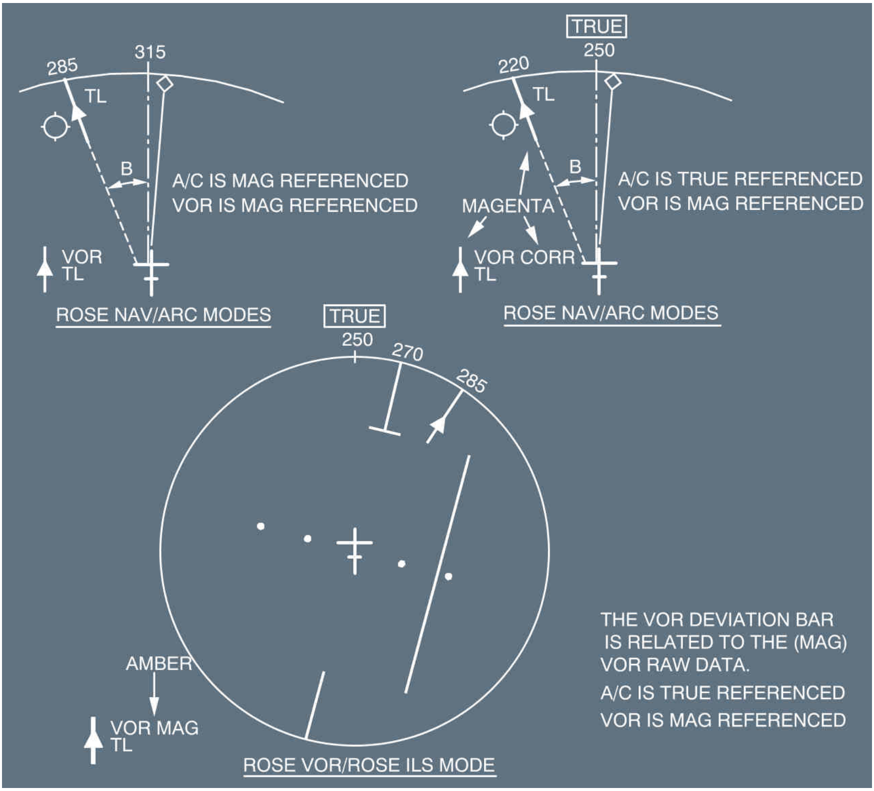
When the ND display mode is ARC or ROSENAV, the FM-computed data (aircraft position, F-PLN legs, NAVAID position symbol...) is provided along with VOR needles, if selected.

→ it is important, in these display modes, that the FM data and the VOR raw data be consistent.
Hence, if the cockpit NORTH REF selection does not match the VOR station reference, there may be a discrepancy between the VOR raw data and the FM data, unless a correction is applied to the VOR data.

PRINCIPLE

When the ND is in ARC/ROSE NAV mode, if there is a mismatch between the NORTH REF selection and the VOR station reference, the VOR needle is equal to the VOR raw bearing corrected by the local variation at the aircraft's present position.
In that case, the needle is displayed in magenta colour, the label CORR (corrected) is displayed in magenta in the lower corner of the ND.
In all other ND display modes (ROSE VOR, ROSE ILS), the VOR raw data (with no correction) is displayed. MAG or TRUE (amber) is displayed next to the VOR identifier, when its reference does not match the cockpit selection.

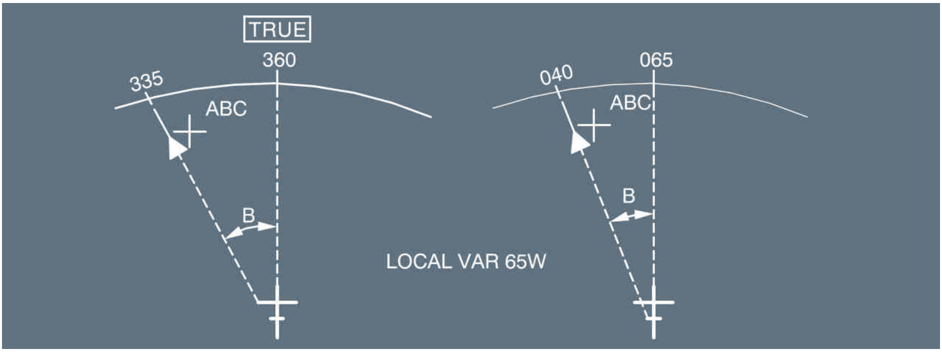
EXAMPLE	Local variation 65W – TL is a magnetic referenced VOR.


285
315
TL
B
A/C IS MAG REFERENCED
VOR IS MAG REFERENCED
VOR
TL
ROSE NAV/ARC MODES
TRUE
250
220
TL
B
MAGENTA
A/C IS TRUE REFERENCED
VOR IS MAG REFERENCED
VOR CORR
TL
ROSE NAV/ARC MODES
TRUE
250
270
285
AMBER
VOR MAG
TL
ROSE VOR/ROSE ILS MODE
THE VOR DEVIATION BAR
IS RELATED TO THE (MAG)
VOR RAW DATA.
A/C IS TRUE REFERENCED
VOR IS MAG REFERENCED

VOR transmitter Reference	ND display MODE	Cockpit Reference Selection	
		TRUE	**MAG**
TRUE	ARC/ROSE NAV	VOR Raw data	VOR is corrected
	ROSE VOR/ILS	VOR RAW DATA	
MAG	ARC/ROSE NAV	VOR is corrected	VOR Raw Data
	ROSE VOR/ILS	VOR RAW DATA	

ADF AND VOR BEARING DISPLAY

- The ADF needle represents the relative bearing between the aircraft and the NDB.
  The ADF relative bearing information (B) is thus independant of the TRUE/MAG selection, and the needle is always pointing to the same direction whatever is the selection.
  Furthermore (provided FM position is accurate) when the EFIS ND is in ARC or ROSE NAV modes, the ADF needle will point towards the NDB symbol as provided by the FMS.



- The VOR bearing is measured by the VOR, at the VOR location:
  - it is a TRUE bearing, if the VOR station is TRUE-referenced.
  - it is a MAG bearing, if the VOR station is MAG-referenced.

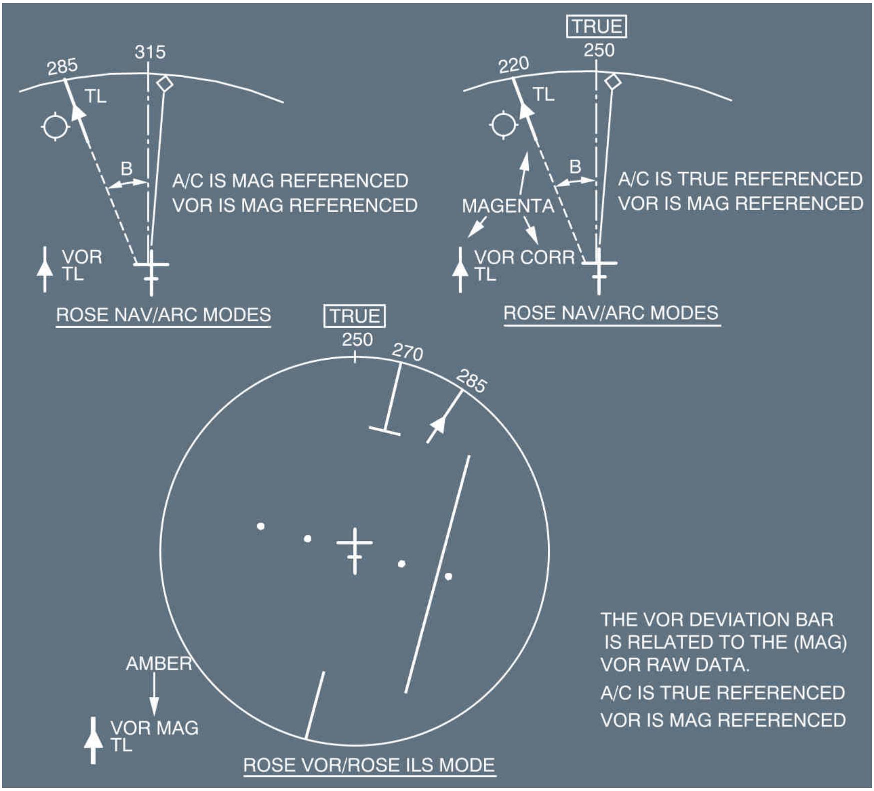
  When the ND display mode is ARC or ROSENAV, the FM-computed data (aircraft position, F-PLN legs, NAVAID position symbol...) are provided along with VOR needles, if selected.

  → it is important, in these display modes, that the FM data and the VOR raw data be consistent.
  Hence, if the cockpit NORTH REF selection does not match the VOR station reference, there may be a discrepancy between the VOR raw data and the FM data, unless a correction is applied to the VOR data.

PRINCIPLE

When the ND is in ARC/ROSE NAV mode, if there is a mismatch between the NORTH REF selection and the VOR station reference, the VOR needle is equal to the VOR raw bearing corrected by the local variation at the aircraft's present position.
In that case, the needle is displayed in magenta colour, the label CORR (corrected) is displayed in magenta in the lower corner of the ND.
In all other ND display modes (ROSE VOR, ROSE ILS), the VOR raw data (with no correction) is displayed. MAG or TRUE (amber) is displayed next to the VOR identifier, when its reference does not match the cockpit selection.

EXAMPLE	Local variation 65W – TL is a magnetic referenced VOR.


285
315
TL
B
A/C IS MAG REFERENCED
VOR IS MAG REFERENCED
VOR
TL
ROSE NAV/ARC MODES
TRUE
250
220
TL
B
A/C IS TRUE REFERENCED
VOR IS MAG REFERENCED
MAGENTA
VOR CORR
TL
ROSE NAV/ARC MODES
TRUE
250
270
285
AMBER
VOR MAG
TL
THE VOR DEVIATION BAR
IS RELATED TO THE (MAG)
VOR RAW DATA.
A/C IS TRUE REFERENCED
VOR IS MAG REFERENCED
ROSE VOR/ROSE ILS MODE

VOR transmitter Reference	ND display MODE	Cockpit Reference Selection	
		TRUE	MAG
TRUE	ARC/ROSE NAV	VOR Raw data	VOR is corrected
	ROSE VOR/ILS	VOR RAW DATA	
MAG	ARC/ROSE NAV	VOR is corrected	VOR Raw Data
	ROSE VOR/ILS	VOR RAW DATA	

Ident.: DSC-22_20-60-130-A-00001357.0001001 / 16 MAR 11
Applicable to: LV-GKO, LV-GKP

DDRMI

The heading provided by the DDRMI is directly linked to the NORTH REF cockpit selection.

The VOR bearing indications are raw data, as provided by the station.

PROCEDURES - FLIGHT

Ident.: DSC-22_20-60-130-00001359.0003001 / 23 DEC 14
Applicable to: LV-GKO, LV-GKP

FLIGHT

TAKEOFF:

If the “CHECK NORTH REF” amber message comes up on the ND and MCDU, verify that the NORTH REF selection matches the origin airport reference.

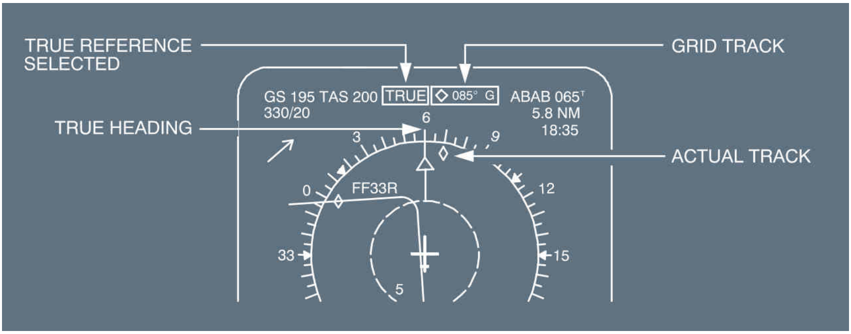
Note: *The “CHECK NORTH REFERENCE” amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.*

CRUISE:

When reaching an area where the heading reference should be changed (oceanic area, airway or polar track defined in TRUE reference ...);

SELECT TRUE by pressing the NORTH REF pushbutton.

When reaching 65 N with TRUE reference selected, the GRID TRACK is provided on the ND's upper right box. The ND compass still displays true track and heading.
GRID TRK along with XTK are the cues to be used to monitor the proper lateral guidance.

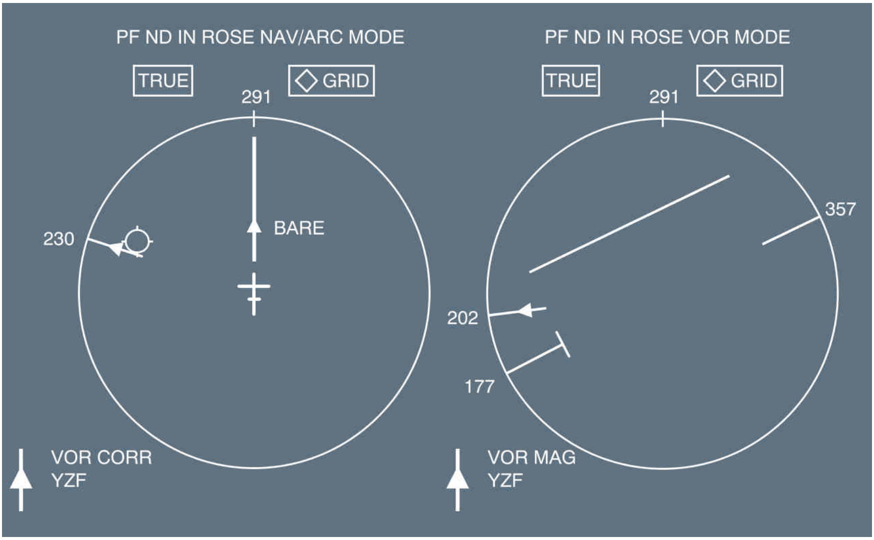


If the “SELECT TRUE” message appears on the ND/MCDU, this indicates that the aircraft has reached the Polar zone with MAG reference still selected in the cockpit. Press the NORTH REF pushbutton to select TRUE.

- *Use of VOR/DME*
  En route, the VOR/DME are basically used for either FM NAV ACCY crosscheck, or to report to ATC on a given radial.
  The FM NAV ACCY crosscheck is achieved, as usual, by comparing the bearing/distance displayed on the ND with the bearing/distance displayed on the PROG page.
  In case the VOR used is defined in another reference (e.g MAG) than the one selected in the cockpit (e.g. TRUE), the bearing provided on ND is magenta and is corrected; the VOR corrected bearing should be within 5 ° of the FM-computed bearing (taking into consideration the meridian convergence and the difference of magnetic variation).
  → *If there is a doubt, select the NORTH REF to the VOR reference, and check the bearings.*

CAUTION	*The correction of VOR indications in ROSENAV or ARC ND modes depend on a correct navigation database coding. If the North reference (TRUE/MAG) that is coded for the VOR orientation is not correct, the VOR indication correction will be unduly applied.* *If VOR needles are in magenta (CORR), check both the aircraft NORTH REF selection and the VOR station orientation on the navigation charts.*

If the aircraft has to report on a given radial of a VOR, which is defined in a different reference (e.g MAG) from the cockpit reference (e.g. TRUE), check the RADIAL crossing on the PM ND set to ROSE VOR mode or use DDRMI e.g.: aircraft flies NCA 24. (NCA 24 is TRUE referenced route). ATC requests the aircraft to report on RADIAL 357 from YZF (MAG-referenced).


PF ND IN ROSE NAV/ARC MODE
TRUE
◇ GRID
291
230
BARE
VOR CORR
YZF
PF ND IN ROSE VOR MODE
TRUE
◇ GRID
291
357
202
177
VOR MAG
YZF

- Use of ADF
  The Polar Zone NDBs are quite powerful, and the bearing can be received at long distances.
- USE these NDBs to check the reasonableness of the FM navigation by comparing the ADF bearing, that is displayed on the ND, with the FM-computed bearing, that is displayed on the PROG page

- Flying the pole
  - In most cases, the autopilot will be in NAV mode.
    When approaching the pole, a CHECK HDG message appears, with the associated ECAM Procedure.
    - ■ Disregard the ECAM Procedure.
      The message is due to the fact that the IRSs do not reach the pole simultaneously; thus the headings do not turn simultaneously from 360 to 180 °.
  - in case HDG mode is used (e.g FM 1 + 2 failed and Back Up NAV is used)
    - ■ The autopilot onside the best IRS is to be engaged.
      The offside HDG bug (▿) should be disregarded when close to the pole since, the IRS headings may differ.
- Approach
  - If CHECK NORTH REF amber message comes up on ND and MCDU, verify that the NORTH REF pusbutton is selected to the destination airport reference.

    Note: *The “CHECK NORTH REFERENCE” amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.*
  - If TRUE is selected for approach, only CAT I ILS may be flown.

PROCEDURES - FLIGHT

Ident.: DSC-22_20-60-130-00001359.0004001 / 23 DEC 14
Applicable to: LV-KHT, LV-KHU

FLIGHT

TAKEOFF:

If the “CHECK NORTH REF” amber message comes up on the ND and MCDU, verify that the NORTH REF selection matches the origin airport reference.

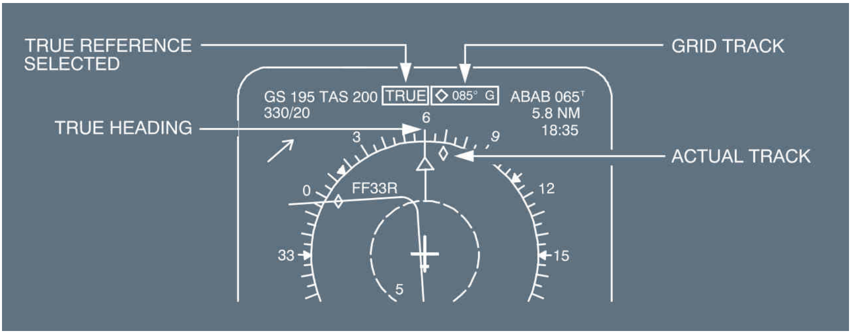
Note: *The “CHECK NORTH REFERENCE” amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.*

CRUISE:

When reaching an area where the heading reference should be changed (oceanic area, airway or polar track defined in TRUE reference ...);

SELECT TRUE by pressing the NORTH REF pushbutton.

When reaching 65 N with TRUE reference selected, the GRID TRACK is provided on the ND's upper right box. The ND compass still displays true track and heading.
GRID TRK along with XTK are the cues to be used to monitor the proper lateral guidance.

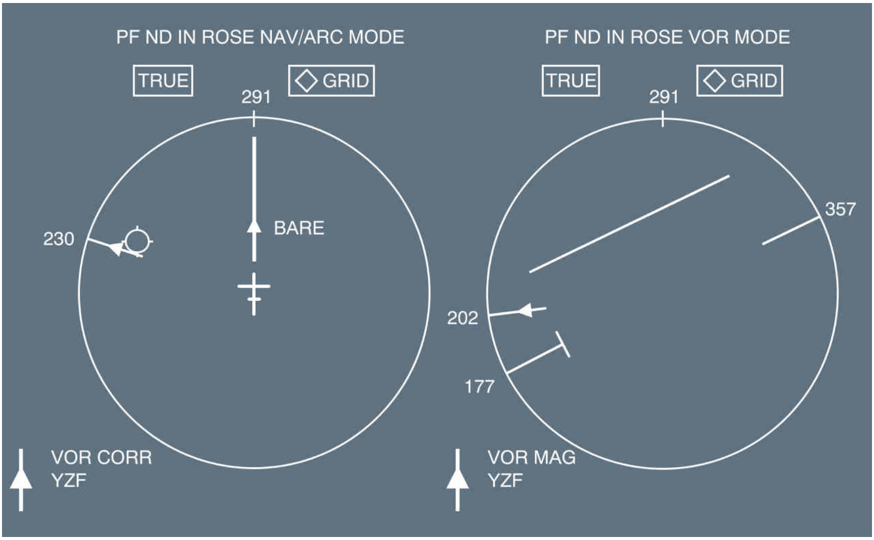


If the "SELECT TRUE" message appears on the ND/MCDU, this indicates that the aircraft has reached the Polar zone with MAG reference still selected in the cockpit. Press the NORTH REF pushbutton to select TRUE.

- *Use of VOR/DME*
  En route, the VOR/DME are basically used for either FM NAV ACCY crosscheck, or to report to ATC on a given radial.
  The FM NAV ACCY crosscheck is achieved, as usual, by comparing the bearing/distance displayed on the ND with the bearing/distance displayed on the PROG page.
  In case the VOR used is defined in another reference (e.g MAG) than the one selected in the cockpit (e.g. TRUE), the bearing provided on ND is magenta and is corrected; the VOR corrected bearing should be within 5 ° of the FM-computed bearing (taking into consideration the meridian convergence and the difference of magnetic variation).
  → *If there is a doubt, select the NORTH REF to the VOR reference, and check the bearings.*

CAUTION	*The correction of VOR indications in ROSENAV or ARC ND modes depend on a correct navigation database coding. If the North reference (TRUE/MAG) that is coded for the VOR orientation is not correct, the VOR indication correction will be unduly applied.* *If VOR needles are in magenta (CORR), check both the aircraft NORTH REF selection and the VOR station orientation on the navigation charts.*

If the aircraft has to report on a given radial of a VOR, which is defined in a different reference (e.g MAG) from the cockpit reference (e.g. TRUE), check the RADIAL crossing on the PM ND set to ROSE VOR mode or use DDRMI e.g.: aircraft flies NCA 24. (NCA 24 is TRUE referenced route). ATC requests the aircraft to report on RADIAL 357 from YZF (MAG-referenced).


PF ND IN ROSE NAV/ARC MODE
TRUE
GRID
291
230
BARE
VOR CORR
YZF
PF ND IN ROSE VOR MODE
TRUE
GRID
291
357
202
177
VOR MAG
YZF

- Flying the pole
  - In most cases, the autopilot will be in NAV mode.
    When approaching the pole, a CHECK HDG message appears, with the associated ECAM Procedure.
    - ■ Disregard the ECAM Procedure.
      The message is due to the fact that the IRSs do not reach the pole simultaneously; thus the headings do not turn simultaneously from 360 to 180 °.
  - in case HDG mode is used (e.g FM 1 + 2 failed and Back Up NAV is used)
    - ■ The autopilot onside the best IRS is to be engaged.
      The offside HDG bug (▿) should be disregarded when close to the pole since, the IRS headings may differ.
- Approach
  - If CHECK NORTH REF amber message comes up on ND and MCDU, verify that the NORTH REF pusbutton is selected to the destination airport reference.

    Note: *The “CHECK NORTH REFERENCE” amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.*
  - If TRUE is selected for approach, only CAT I ILS may be flown.

PROCEDURES - FLIGHT

Ident.: DSC-22_20-60-130-00001359.0008001 / 23 DEC 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

FLIGHT

TAKEOFF:

If the “CHECK NORTH REF” amber message comes up on the ND and MCDU, verify that the NORTH REF selection matches the origin airport reference.

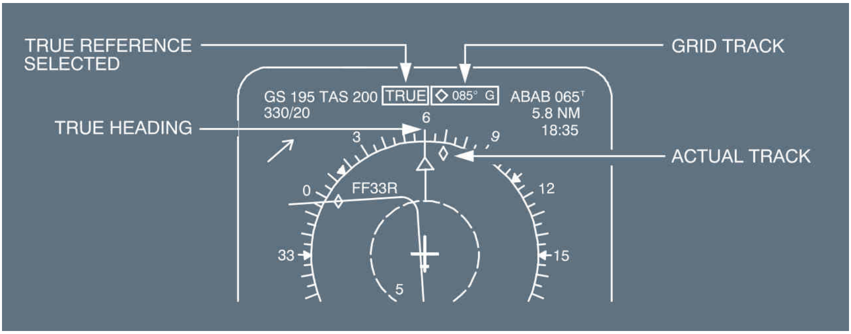
Note: *The “CHECK NORTH REFERENCE” amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.*

CRUISE:

When reaching an area where the heading reference should be changed (oceanic area, airway or polar track defined in TRUE reference ...);

SELECT TRUE by pressing the NORTH REF pushbutton.

When reaching 65 N with TRUE reference selected, the GRID TRACK is provided on the ND's upper right box. The ND compass still displays true track and heading.
GRID TRK along with XTK are the cues to be used to monitor the proper lateral guidance.

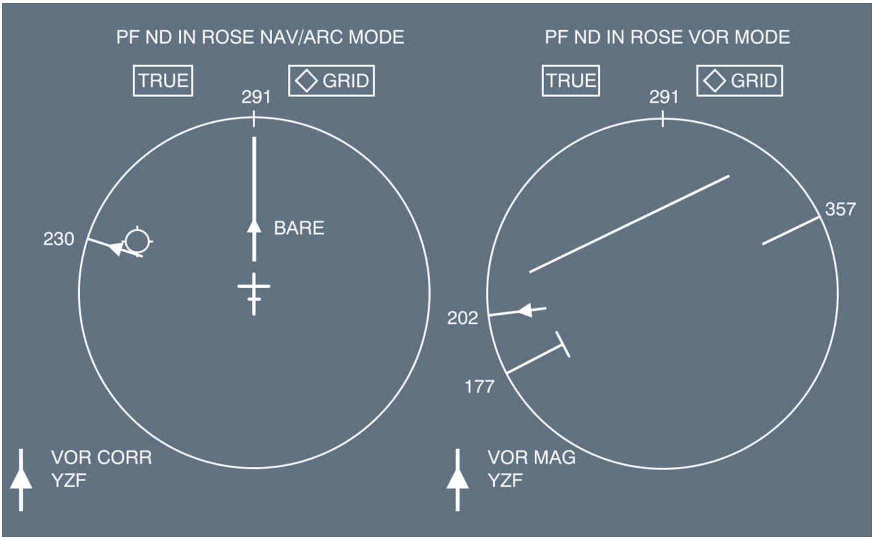


If the “SELECT TRUE” message appears on the ND/MCDU, this indicates that the aircraft has reached the Polar zone with MAG reference still selected in the cockpit. Press the NORTH REF pushbutton to select TRUE.

- *Use of VOR/DME*
  En route, the VOR/DME are basically used for either FM NAV ACCY crosscheck, or to report to ATC on a given radial.
  The FM NAV ACCY crosscheck is achieved, as usual, by comparing the bearing/distance displayed on the ND with the bearing/distance displayed on the PROG page.
  In case the VOR used is defined in another reference (e.g MAG) than the one selected in the cockpit (e.g. TRUE), the bearing provided on ND is magenta and is corrected; the VOR corrected bearing should be within 5 ° of the FM-computed bearing (taking into consideration the meridian convergence and the difference of magnetic variation).
  → *If there is a doubt, select the NORTH REF to the VOR reference, and check the bearings.*

CAUTION	*The correction of VOR indications in ROSENAV or ARC ND modes depend on a correct navigation database coding. If the North reference (TRUE/MAG) that is coded for the VOR orientation is not correct, the VOR indication correction will be unduly applied.* *If VOR needles are in magenta (CORR), check both the aircraft NORTH REF selection and the VOR station orientation on the navigation charts.*

If the aircraft has to report on a given radial of a VOR, which is defined in a different reference (e.g MAG) from the cockpit reference (e.g. TRUE), check the RADIAL crossing on the PM ND set to ROSE VOR mode. (EX: aircraft flies NCA 24): (NCA 24 is TRUE referenced route). ATC requests the aircraft to report on RADIAL 357 from YZF (MAG-referenced).


PF ND IN ROSE NAV/ARC MODE
TRUE
◇ GRID
291
230
BARE
VOR CORR
YZF
PF ND IN ROSE VOR MODE
TRUE
◇ GRID
291
357
202
177
VOR MAG
YZF

- Use of ADF
  The Polar Zone NDBs are quite powerful, and the bearing can be received at long distances.

USE these NDBs to check the reasonableness of the FM navigation by comparing the ADF bearing, that is displayed on the ND, with the FM-computed bearing, that is displayed on the PROG page.

- *Flying the pole*
  - *In most cases, the autopilot will be in NAV mode.*
    When approaching the pole, a CHECK HDG message appears, with the associated ECAM Procedure.

    ■ *Disregard the ECAM Procedure.*
    The message is due to the fact that the IRSs do not reach the pole simultaneously; thus the headings do not turn simultaneously from 360 to 180 °.
  - *in case HDG mode is used (e.g FM 1 + 2 failed and Back Up NAV is used)*

    ■ *The autopilot onside the best IRS is to be engaged.*
    The offside HDG bug (▿) should be disregarded when close to the pole since, the IRS headings may differ.
- *Approach*
  - *If CHECK NORTH REF amber message comes up on ND and MCDU, verify that the NORTH REF pusbutton is selected to the destination airport reference.*

    Note: The "CHECK NORTH REFERENCE" amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.
  - *If TRUE is selected for approach, only CAT I ILS may be flown.*

Intentionally left blank

LOSS OF ONE IRS

Ident.: DSC-22_20-60-140-00001360.0001001 / 03 NOV 22
Applicable to: ALL

- Consequences
  - 2 IRS/2 FMGECs available
  - MIX IRS position of each FMGEC = its onside IRS position
- Limitations
  None

Note: *If FMS 1/FMS 2 POS DIFF message comes up, check the IRSs position. If they differ by more than 20 NM prior entry into NAT-HLA area, consider a diversion.*

PROCEDURES

APPLY ECAM procedure (ATT/HDG switching if required)
DETERMINE the best IRS
USE the AP associated to the best IRS.

LOSS OF TWO IRSS

Ident.: DSC-22_20-60-140-00001361.0001001 / 03 NOV 22
Applicable to: ALL

- Consequences:
  - 1 IRS/2 FMGEC are still available. One navigation system available only
  - No AP/FD/ATHR
  - EFIS display on SINGLE SOURCE.
- Limitation
  - If the aircraft is not yet in NAT-HLA area, do not enter.
  - If the aircraft is within NAT-HLA area, continue but advise ATC of navigation degradation.

PROCEDURES

APPLY ECAM procedure
FLY the aircraft manually (ALTN LAW – PROT LOST)

In order to recover EIS display on both sides, select EIS DMS switching to DMC 1(2) EFIS SINGLE SOURCE message is displayed on PFD

SELECT TRK/FPV : adjust FCU TRK target so as to keep XTK = 0.0

Specifics for Long Range

APPLY the normal procedures except those linked to unavailability of NAV mode
When closing up the TO WPT: READ the OUTBND TRK the NEXT WPT

When sequencing the waypoint, SELECT the OUTBND TRK on the FCU, and fly the FPV to the TRK symbol on the horizon.

Note the TIME – GS – FOB when overhead.

ENVISAGE plotting technic on the chart at mid point of the leg.

LOSS OF ONE MCDU

Ident.: DSC-22_20-60-140-00001362.0001001 / 17 MAR 11
Applicable to: ALL

- Consequences
  3 IRSs, 2 FMGECs, 2 MCDUs are still available

  Note: MCDU 3 is not able to achieve the Back Up navigation.
- Limitation
  None

PROCEDURE

SELECT the failed MCDU off. The MCDU 3 automatically replaces it.

LOSS OF ONE FMGEC

Ident.: DSC-22_20-60-140-00001363.0001001 / 17 MAR 11
Applicable to: ALL

- Consequences
  - 3 IRSs/1 FMGEC/2 MCDUs are still available
  - Back up navigation is available on the failed side.
- Limitation
  None

PROCEDURES

CHECK BACK UP NAV function is available on the failed side
SELECT MCDU MENU page
PRESS NAV B/UP prompt and check that the F-PLN is displayed on the MCDU and ND
SELECT MCDU MENU page back and deselect the NAV B/UP prompt.
SELECT FM SOURCE switch to BOTH ON 1 or 2 position (ECAM procedure)
SELECT the AP associated to the live FMGEC

APPLY normal procedures

Note: *If the FM fails on the master FG side with NAV mode engaged, the AP disengages ; the FD reverts to HDG (TRK) and SPD target reverts from managed to selected. Engage the other AP, NAV mode and SPD managed. Both PFD display the same FD (1FD1 or 2FD2 is displayed).*

LOSS OF TWO FMGECS

Ident.: DSC-22_20-60-140-00001364.0001001 / 03 NOV 22
Applicable to: ALL

- Consequences
  - 3(2) IRSs/2 BACKUP NAV still available
  - No AP/FD managed modes
  - No managed target speed or Mach.
- Limitation

  None: there are still two independant navigation systems.

Note: *IRS positions must be monitored closely. If they differ by more than 20 NM prior entry into NAT-HLA area, diversion might be envisaged.*

PROCEDURES

CHECK/SELECT FM SOURCE selector to NORMAL
SELECT NAV B/UP on both MCDU MENU pages
SELECT NAV on both RMPs
SELECT TRK/FPA and try to engage one autopilot in TRK/ALT mode. (If the 2 FGs are available, engage the autopilot onside of the best IR)
SELECT proper speed/Mach target and engage A/THR
REFER to BACK UP NAV operation (*Refer to DSC-22_20-60-150 General*)
Specifics for Long Range : USE TRK mode to keep XTK = 0.0 on the BEST IRS side.

● **When closing the TO WPT:**

READ the OUTBND TRK to the NEXT WPT

COMPARE backup navigation F-PLN distance to the NEXT WPT with the computerized F-PLN

When sequencing the WPT, SELECT the OUTBND TRK on the FCU and note : Time – GS – FOB when overhead

ENVISAGE plotting technic on the chart at mid point of the leg.

FMS 1/2 INDEPENDENT OPERATIONS

Ident.: DSC-22_20-60-140-00001365.0001001 / 16 MAR 11
Applicable to: ALL

- Consequences
  - no crosstalk between both FMGECs : they work independently
  - Any entry on one MCDU must be achieved on the other one
  - No monitoring between both FMGECs
- Limitation
  None

PROCEDURES

APPLY the normal procedures, but all entries have to be duplicated
Both pilots have to MONITOR separately each FMGEC (especially in terms of navigation accuracy).

Note: *If the active F-PLN legs are different in both FMGECs, the flight director bars will only be centered on the engaged autopilot side.*
If the autopilot is then changed, the aircraft will turn towards the active leg of the other FMGEC.

GENERAL

Ident.: DSC-22_20-60-150-00001366.0003001 / 30 AUG 18
Applicable to: ALL

The MCDU NAV B/UP allows to link a MCDU to its associated IRS in order to allow the pilot to monitor the navigation and to be provided with some basic flight planning functions in some failure cases.

CAUTION	The MCDU NAV B/UP is to be used in case of FM 1 + 2 failure. It can be selected temporarily in case of FM 1 or 2 only failure, in order to ensure that the function is available on the failed side. When in MCDU NAV B/UP on both sides, one FG at least must be available to engage AP and A/THR.

In some particular failure cases where "MAP NOT AVAIL" message is permanently displayed on both ND, NAV B/UP may be used to recover the aircraft position. In this case the flight crew may attempt a manual FM reset (one after the other), then:

- If "MAP NOT AVAIL" message is still displayed, the consultation of the POSITION MONITOR page will allow to check IRS position and/or RADIO/GPIRS position,
- If IRS position and/or RADIO/GPIRS position are valid, the flight crew can activate the NAV B/UP.

The MCDU NAV B/UP function provides :
- aircraft position using onside IRS or IRS 3
- F-PLN as memorized in the MCDU
- F-PLN display on ND
- F-PLN automatic sequencing
- AP/FD selected modes, if at least one FG is available
- Limited lateral revisions
- MAG (True) bearing depending on the pilot selection, from aircraft position to the TO WPT and associated distance
- True track between waypoints
- Time estimates computed with current GS from onside IRS
- Total time and distance to destination

The following features are not provided :

- No DATA BASE available :
  - No autotuning, NAVAIDS must be selected on RMP
  - No radio position, no GPS position
  - No EFIS CTL PANEL options
  - No LDG ELEV (must be manually selected on overhead panel)
- No performance data:
  - No CLB/DES/APP NAV/FINAL modes
  - No SPEED MANAGED
  - No automatic SPD/MACH change over
- Most of predictions are lost:
  - No EFOB
  - No XTRA
  - No ETA at DEST
- No multiple lateral F-PLN
- No AP/FD managed modes
- No crosstalk between MCDUs : F-PLN revisions have to be achieved on both MCDUs.

BACK UP NAV OPERATION

Applicable to: ALL

Ident.: DSC-22_20-60-150-A-00001367.0001001 / 07 NOV 22

FM F-PLN DOWNLOAD IN MCDU

While BACK UP NAV is not active, the FM downloads permanently a condensed form of the F-PLN in the MCDU.

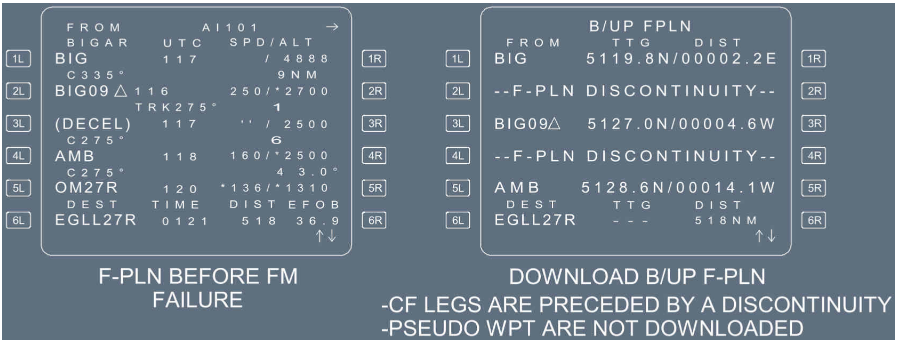
Downloaded information include :

- waypoint position
- waypoint identifier
- leg type
- discontinuity
- overfly
- turn direction

Heading legs, course to fix legs, ..., computed INTCPT positions, pseudo waypoints, ..., cannot be downloaded.
They are replaced by discontinuities.
Maximum of 150 waypoints are downloaded.

Ident.: DSC-22_20-60-150-A-00001368.0002001 / 16 MAR 11

EXAMPLE OF DOWNLOADED F-PLN



```
 FROM         AI101        →
 BIGAR    UTC   SPD/ALT
BIG       117        / 4888
 C335°                  9NM
BIG09△ 116      250/*2700
        TRK275°         1
(DECEL)   117      '' / 2500
 C275°                  6
AMB       118      160/*2500
 C275°                 43.0°
OM27R     120     *136/*1310
 DEST    TIME    DIST  EFOB
EGLL27R  0121     518  36.9
                           ↑↓
```

F-PLN BEFORE FM FAILURE

```
          B/UP FPLN
 FROM      TTG       DIST
BIG      5119.8N/00002.2E
--F-PLN DISCONTINUITY--
BIG09△   5127.0N/00004.6W
--F-PLN DISCONTINUITY--
AMB      5128.6N/00014.1W
 DEST      TTG       DIST
EGLL27R    ---       518NM
                        ↑↓
```

DOWNLOAD B/UP F-PLN

-CF LEGS ARE PRECEDED BY A DISCONTINUITY

-PSEUDO WPT ARE NOT DOWNLOADED

In that procedure, all the legs are coded as CF (Course to Fix) legs. This explains all the discontinuities resulting in the B/UP F-PLN.
These discontinuities may be cleared.

- **When the second FM fails**

  REENGAGE and SELECT the required AP and A/THR modes (if disconnected).

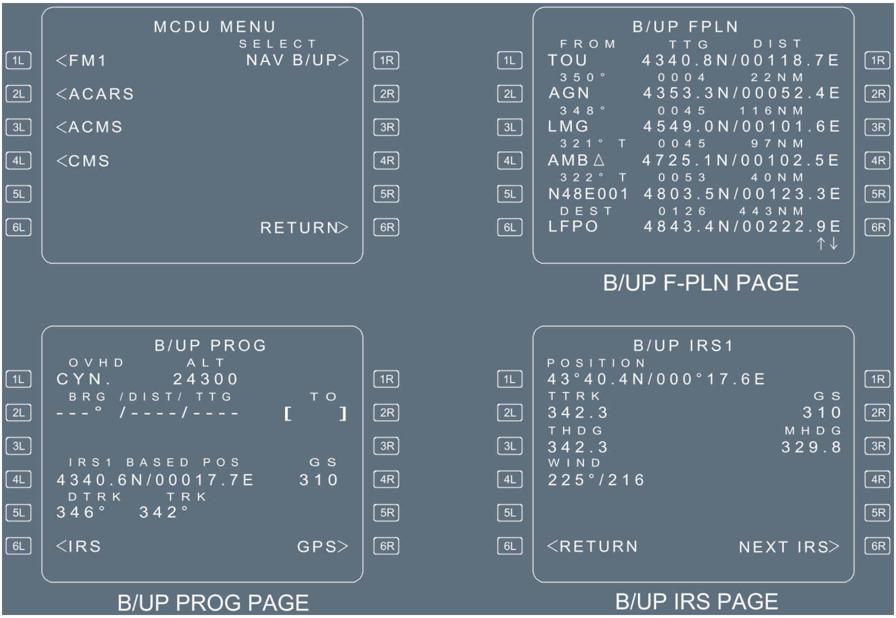
  SELECT the FM SOURCE SELECTOR to NORM

  MCDU MENU page is automatically displayed.
  NAV B/UP prompt appears.

  SELECT the NAV B/UP prompt on both MCDU.

  SELECT NAV on both RMP

  Tune the required navaids



```
              MCDU MENU
                            SELECT
<FM1                      NAV B/UP>

<ACARS

<ACMS

<CMS



                           RETURN>
```

```
              B/UP FPLN
 FROM           TTG        DIST
TOU        4340.8N/00118.7E
 350°       0004        22NM
AGN        4353.3N/00052.4E
 348°       0045       116NM
LMG        4549.0N/00101.6E
 321° T     0045        97NM
AMB△       4725.1N/00102.5E
 322° T     0053        40NM
N48E001    4803.5N/00123.3E
 DEST       0126       443NM
LFPO       4843.4N/00222.9E
                             ↑↓
```

B/UP F-PLN PAGE

```
              B/UP PROG
 OVHD         ALT
CYN.        24300
 BRG /DIST/ TTG                 TO
---° /----/----          [       ]


 IRS1 BASED POS                 GS
4340.6N/00017.7E               310
 DTRK        TRK
346°     342°

<IRS                          GPS>
```

B/UP PROG PAGE

```
              B/UP IRS1
POSITION
43°40.4N/000°17.6E
TTRK                            GS
342.3                          310
THDG                          MHDG
342.3                        329.8
WIND
225°/216


<RETURN                  NEXT IRS>
```

B/UP IRS PAGE

- Only MCDU MENU
  F-PLN key
  PROG key
  DIR key
- B/UP F-PLN page
  B/UP PROG page
  B/UP IRS 1, 2, 3 pages are available when BACK UP NAV is selected.
- B/U GPS (GPS ⨞).

Ident.: DSC-22_20-60-150-A-00001369.0001001 / 16 MAR 11

AP AND A/THR

One FG at least must be available to allow the engagement of AP/FD and A/THR.

All FM managed modes are lost as well as managed speed. As a consequence :
- LAT F-PLN is flown in HDG/TRK modes
- VERT F-PLN is flown in OPEN/V/S/FPA modes
- SPD TARGET is manually SELECTED on the FCU
- SPD/MACH crossover is manually SELECTED on the FCU

It is recommended to use the TRK/FPA modes :
- SELECT the required TRK on FCU at waypoint sequencing (as no AP/FD coupling exists in NAV B/UP). F-PLN sequencing is automatic.
- MONITOR the track of the next leg prior reaching the TO waypoint (track between TO and next waypoints is true track).
- ADJUST the track to follow the F-PLN with X-TRK = 0
- USE OP DES or FPA to descend as suitable.
  FPA allows easy altitudes predictions :
  DNM = Δ(FL)/FPA°

Ident.: DSC-22_20-60-150-A-00001370.0002001 / 16 MAR 11

NAVIGATION MONITORING

The navigation accuracy check must be achieved periodically using the same principle as with FM navigation:

COMPARE computed data with raw data
SELECT ON RMP the applicable NAVAID
PRESS the [PROG] key

B/UP PROG page is displayed

WRITE in the scratchpad then ENTER the navaid LAT/LONG
SELECT associated navaid needle on the EFIS control panel.
COMPARE computed BRG/DIST with RAW DATA on ND

- *If the crosscheck is POSITIVE the ND may be used in ROSE NAV/MAP modes with raw data*
- *If the crosscheck is NEGATIVE the ND must be used in ROSE VOR/ROSE ILS modes.*

Note: *B/UP IRS and B/UP GPS (GPS ◁) pages may also be used to check the position.*

Ident.: DSC-22_20-60-150-A-00001371.0001001 / 16 MAR 11

FLIGHT PLANNING

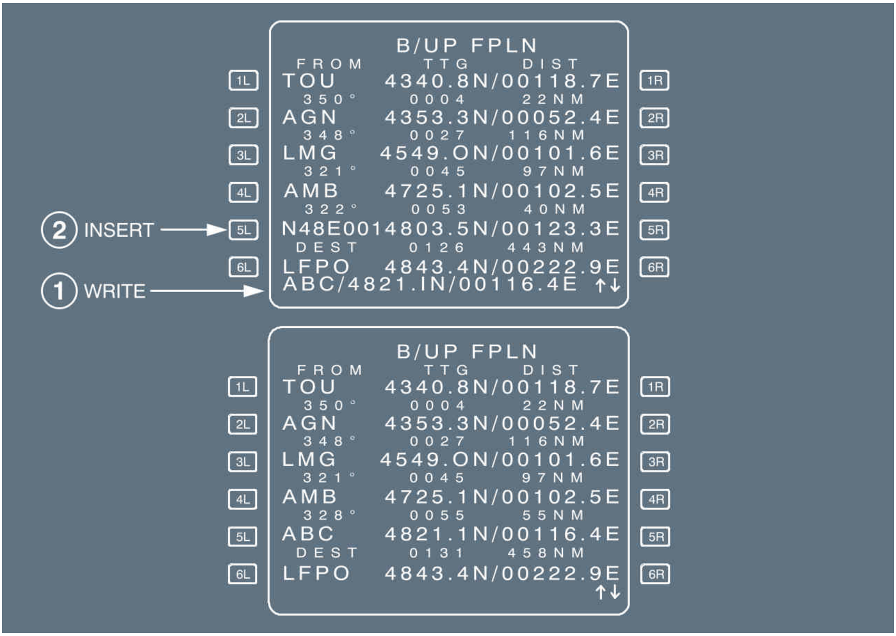
The following revisions may be achieved :
- WPT insertion/deletion
- OVERFLY insertion/deletion
- DIR TO a waypoint
- CLR waypoints/discontinuities

Waypoint identifiers are either published waypoint identifiers if present in the MCDU active F-PLN, or coded LAT/LONG identifiers resulting from pilot entries.
All flight planning functions are directly applied on active F-PLN without LAT REV page.

Ident.: DSC-22_20-60-150-A-00001372.0001001 / 01 OCT 12

WAYPOINT INSERTION

Waypoint insertion into the F-PLN is performed via the B/UP F-PLN page by selecting the line key adjacent to the desired point of insertion, whenever a pre-existing waypoint identifier or valid IDENT/LAT/LONG or LAT/LONG entry is displayed in the scrathpad.
Any waypoint entry which causes the number of legs in the route to exceed the maximum allowed results in the “F-PLN FULL” message.



```
          B/UP FPLN
 FROM        TTG       DIST
TOU      4340.8N/00118.7E
  350°      0004       22NM
AGN      4353.3N/00052.4E
  348°      0027      116NM
LMG     4549.ON/00101.6E
  321°      0045       97NM
AMB      4725.1N/00102.5E
  322°      0053       40NM
N48E0014803.5N/00123.3E
 DEST       0126      443NM
LFPO     4843.4N/00222.9E
ABC/4821.IN/00116.4E  ↑↓
```

```
          B/UP FPLN
 FROM        TTG       DIST
TOU      4340.8N/00118.7E
  350°      0004       22NM
AGN      4353.3N/00052.4E
  348°      0027      116NM
LMG     4549.ON/00101.6E
  321°      0045       97NM
AMB      4725.1N/00102.5E
  328°      0055       55NM
ABC      4821.1N/00116.4E
 DEST       0131      458NM
LFPO     4843.4N/00222.9E
                        ↑↓
```

Note:
- *If the inserted waypoint is entered only with LAT/LONG, its identifier would be : N48E001*
- *If the pilot writes a waypoint IDENT/LAT/LONG with an ident already used in the F-PLN, a message “NOT ALLOWED” is displayed.*

Ident.: DSC-22_20-60-150-A-00001373.0001001 / 16 MAR 11

WAYPOINT DELETION

Waypoint and discontinuity may be deleted from the B/UP F-PLN page by using the CLR key.

Ident.: DSC-22_20-60-150-A-00001374.0001001 / 10 DEC 09

OVERFLY INSERTION/DELETION

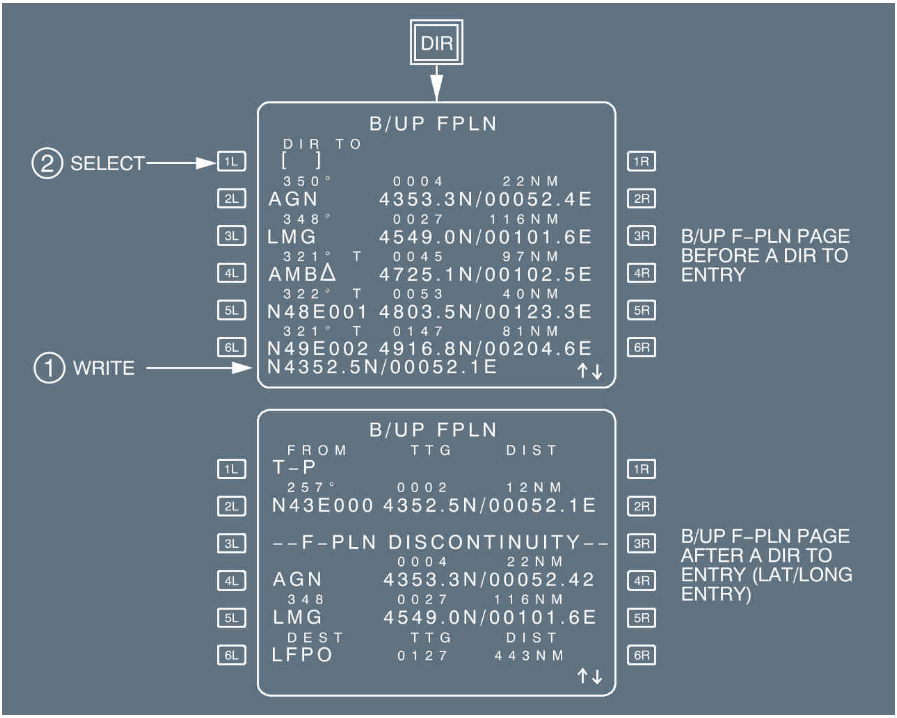
Same as for the FM F-PLN.

Ident.: DSC-22_20-60-150-A-00001376.0001001 / 14 MAY 12

DIRECT TO A WAYPOINT

The DIR TO function operates as for the normal F-PLN, except that RADIAL INTERCEPT and ABEAM functions are not available.

PRESS the DIR key.
WRITE LAT/LONG (or IDENT/LAT/LONG) in scratchpad then INSERT in [1L].
SELECT the proper track on FCU to have the aircraft turn towards the new TO waypoint.


DIR
② SELECT
① WRITE
B/UP FPLN
DIR TO
[ ]
350° 0004 22NM
AGN 4353.3N/00052.4E
348° 0027 116NM
LMG 4549.0N/00101.6E
321° T 0045 97NM
AMBΔ 4725.1N/00102.5E
322° T 0053 40NM
N48E001 4803.5N/00123.3E
321° T 0147 81NM
N49E002 4916.8N/00204.6E
N4352.5N/00052.1E ↑↓
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
B/UP F-PLN PAGE BEFORE A DIR TO ENTRY
B/UP FPLN
FROM TTG DIST
T-P
257° 0002 12NM
N43E000 4352.5N/00052.1E
--F-PLN DISCONTINUITY--
0004 22NM
AGN 4353.3N/00052.42
348 0027 116NM
LMG 4549.0N/00101.6E
DEST TTG DIST
LFPO 0127 443NM
↑↓
B/UP F-PLN PAGE AFTER A DIR TO ENTRY (LAT/LONG ENTRY)

In this example, the entered DIR TO waypoint is a LAT/LONG.
As this new waypoint is not identical to any waypoint in the F-PLN, a direct leg to that waypoint is created and followed by a discontinuity.

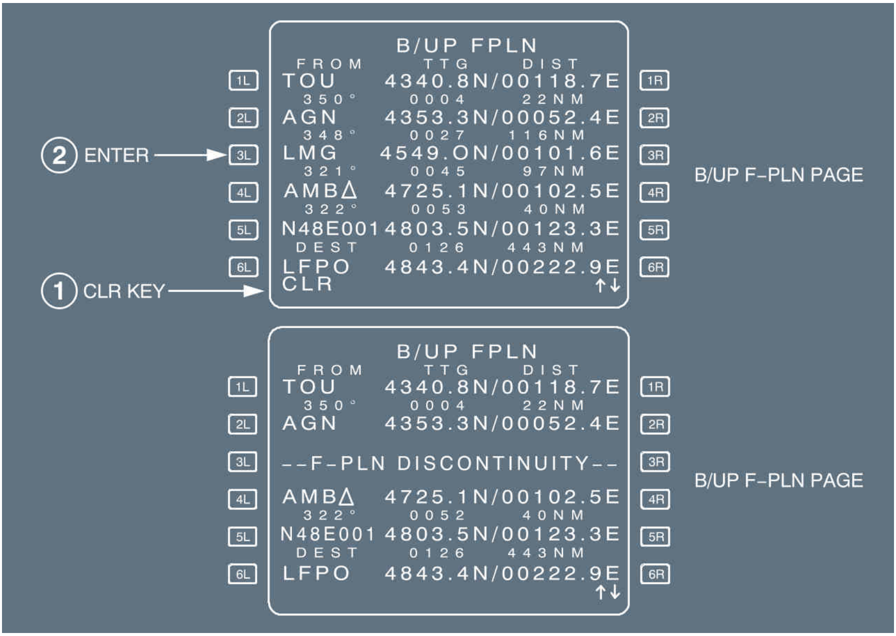
When the DIR TO function is completed, the B/UP F-PLN page is displayed with the DIR TO waypoint as the TO waypoint and T-P as the from waypoint.
In case of DIR TO is achieved to a waypoint belonging to the B/UP F/PLN, no F-PLN discontinuity is created.

Note: *In case of DIR TO a waypoint associated with an OVERFLY condition, the OVERFLY is retained.*

Ident.: DSC-22_20-60-150-A-00001377.0001001 / 01 OCT 12

CLR WAYPOINT/DISCONTINUITY

CLR as for normal operation.



```
          B/UP FPLN
 FROM       TTG      DIST
TOU     4340.8N/00118.7E
  350°      0004     22NM
AGN     4353.3N/00052.4E
  348°      0027    116NM
LMG     4549.0N/00101.6E
  321°      0045     97NM
AMB∆    4725.1N/00102.5E
  322°      0053     40NM
N48E0014803.5N/00123.3E
 DEST       0126    443NM
LFPO    4843.4N/00222.9E
CLR                     ↑↓
```

```
          B/UP FPLN
 FROM       TTG      DIST
TOU     4340.8N/00118.7E
  350°      0004     22NM
AGN     4353.3N/00052.4E

--F-PLN DISCONTINUITY--

AMB∆    4725.1N/00102.5E
  322°      0052     40NM
N48E001 4803.5N/00123.3E
 DEST       0126    443NM
LFPO    4843.4N/00222.9E
                        ↑↓
```

Ident.: DSC-22_20-60-150-A-00001378.0001001 / 23 DEC 14

APPROACHES

ND display selection rule
As per normal operation, it depends upon the result of NAV ACCY CROSS CHECK.
Furthermore it depends also whether the F-PLN is complete, including the approach.

F-PLN	NAV ACCY CHECK	ND	
		PF	PM
Complete with appropriate approach	Positive	ARC or ROSE NAV Ref navaid Raw data	
	Negative	ROSE VOR/ILS	ARC or ROSE NAV or ROSE VOR/ILS Ref Navaid Raw Data
Incomplete	Positive or Negative	ROSE VOR/ILS	

Ident.: DSC-22_20-60-150-A-00001379.0001001 / 10 DEC 09

END OF DESCENT

ADJUST manually the landing elevation on the overhead panel.
SET the MDA on the standby altimeter.

Ident.: DSC-22_20-60-150-A-00001380.0001001 / 16 MAR 11

NON ILS APPROACHES

SELECT on RMP the approach reference NAVAIDs.

The autopilot and flight director available modes are TRK-FPA and HDG/VS
The autothrust available speed target is selected speed.

Ident.: DSC-22_20-60-150-A-00001381.0001001 / 03 NOV 23

ILS APPROACHES

Only CAT I approaches may be flown since the DH indication is not available.

CHECK the ILS frequency and course on the RMP.
PUSH the LS pb on the EFIS control panel.

L2 *The autopilot and flight director available modes are APP (LOC – G/S – LAND).*
The autothrust available speed target is selected speed.

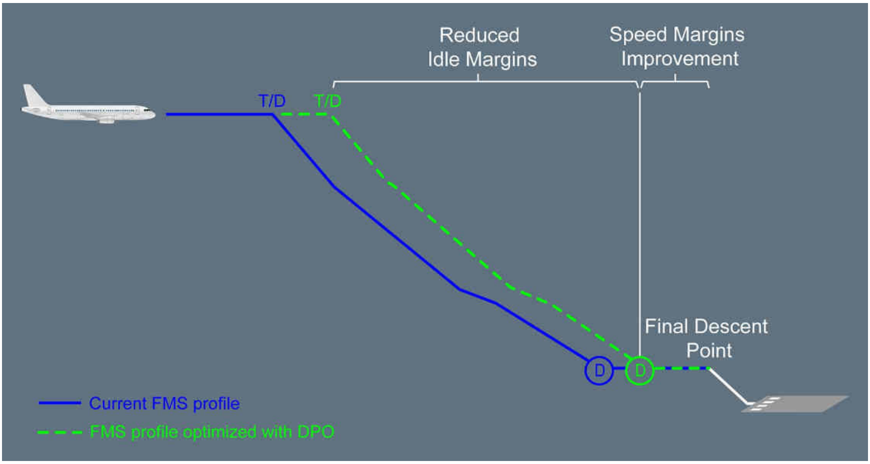
L1 CHECK VAPP in EFB

Intentionally left blank

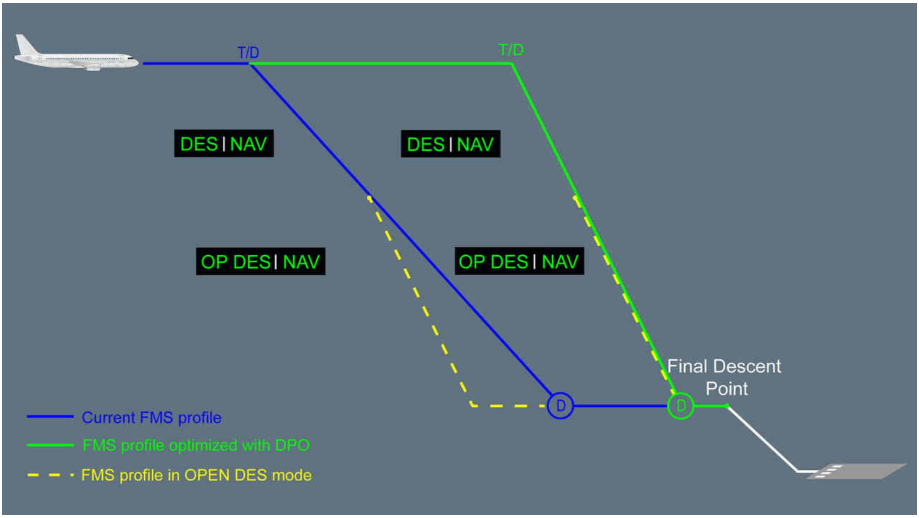
DESCENT PROFILE OPTIMIZATION ⋖

Ident.: DSC-22_20-60-160-00023457.0001001 / 04 JUN 19
Applicable to: ALL

During the idle segment in descent, margins are added to the idle thrust to have more flexibility to maintain the aircraft on the computed descent profile in case of external perturbations such as important wind change.
The Descent Profile Optimization (DPO ⋖) optimizes the computed vertical profile. It decreases the idle thrust margins in descent and the speed margins in approach to reduce fuel burn in descent phase.
With DPO ⋖ , the computed vertical profile is steeper. The T/D is reached later. Before the final approach, the deceleration level-off is shorter.


Reduced
Idle Margins
Speed Margins
Improvement
T/D
T/D
Final Descent
Point
D
D
Current FMS profile
FMS profile optimized with DPO

With DPO ⋖ , along the idle segment, without altitude constraint, the descent profile computed by the FMS is the same as the descent profile of OPEN DES mode. Therefore, reverting in OPEN DES mode during the descent does not change the descent rate.


T/D
T/D
DES | NAV
DES | NAV
OP DES | NAV
OP DES | NAV
Final Descent Point
D
D
Current FMS profile
FMS profile optimized with DPO
FMS profile in OPEN DES mode

With DPO ⧏✻ , the FMS has less flexibility to maintain the aircraft on the computed vertical profile in case of difference between wind entry and effective wind. Therefore, the accurate winds have to be entered in the FMS before descent.

During descent, the VDEV should be closely monitored. If the aircraft goes above the flight descent profile, the flight crew may have to extend speed brakes to go back on the computed descent profile.

If ENG ANTI ICE or ENG ANTI ICE and WING ANTI ICE are used during descent (inducing an increased idle thrust), the flight crew may have to extend speed brakes to stay on the computed descent profile.

FLIGHT PLAN INITIALIZATION THROUGH ACARS (OR ATSU ◁)

Ident.: DSC-22_20-70-00001382.0001001 / 19 DEC 12
Applicable to: ALL

REQUEST FOR ACTIVE FLIGHT PLAN INITIALIZATION BEFORE ENGINE START

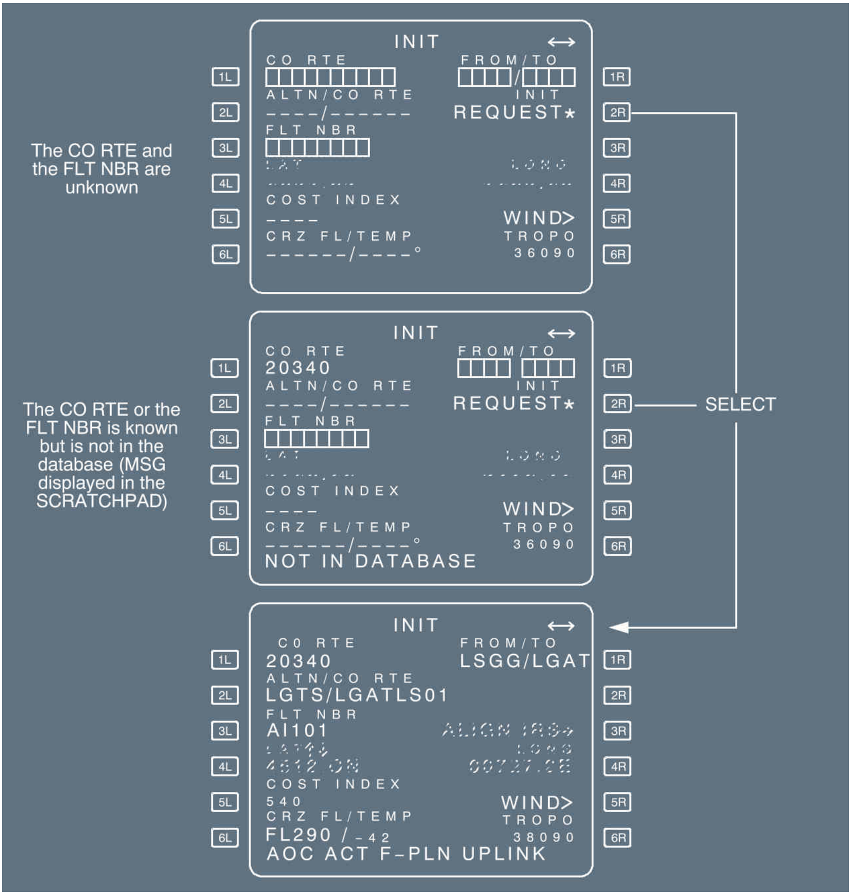
Before engine start, the flight crew may request a route for the active flight plan. When the route is received, “AOC ACT F-PLN UPLINK” message is displayed on the MCDU indicating that the flight plan has been received and automatically inserted.
After engine start, it is not possible to initialize directly the active flight plan since the received flight plan is automatically routed into the secondary, and the MCDU displays “AOC SEC F-PLN UPLINK”.

PROCEDURE

PRESS the INIT REQUEST * prompt.

The star (*) disappears, and dashes appear in all the data fields except:
- *CO RTE, FLT NBR if previously displayed and*
- *Fields with default values.*

The star is not displayed when the FMGES cannot communicate with the ACARS. No request can be sent.
When an active flight plan exists, INIT REQUEST prompt is removed from the active INIT page and no request can be sent for the active flight plan. If a flight plan is entered manually after the request, the uplink message is routed to the secondary flight plan.


The CO RTE and the FLT NBR are unknown
INIT ↔
CO RTE
FROM/TO
ALTN/CO RTE
----/------
INIT
REQUEST*
FLT NBR
LAT
LONG
COST INDEX

WIND>
CRZ FL/TEMP
------/----°
TROPO
36090
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
The CO RTE or the FLT NBR is known but is not in the database (MSG displayed in the SCRATCHPAD)
INIT ↔
CO RTE
20340
FROM/TO
ALTN/CO RTE
----/------
INIT
REQUEST*
FLT NBR
LAT
LONG
COST INDEX

WIND>
CRZ FL/TEMP
------/----°
TROPO
36090
NOT IN DATABASE
SELECT
INIT ↔
CO RTE
20340
FROM/TO
LSGG/LGAT
ALTN/CO RTE
LGTS/LGATLS01
FLT NBR
AI101
ALIGN IRS→
LAT⇅
LONG
4512.0N
00727.2E
COST INDEX
540
WIND>
CRZ FL/TEMP
FL290 /-42
TROPO
38090
AOC ACT F-PLN UPLINK

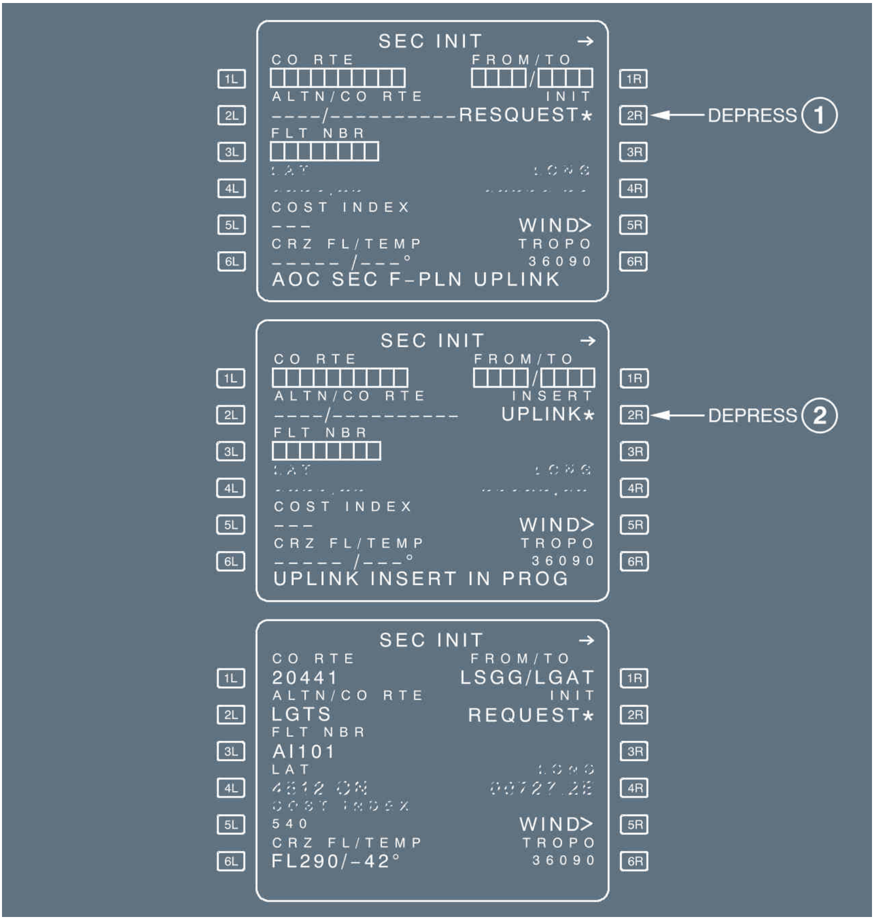
REQUEST FOR SECONDARY FLIGHT PLAN

A request for a secondary flight plan can be initiated anytime. Any flight plan received after engine start is automatically routed into the secondary flight plan.
When the flight plan is received, a message “AOC SEC F-PLN UPLINK” is displayed on the MCDU scratchpad.
Before engine start, and if the SEC F-PLN is empty, any uplinked flight plan is automatically inserted into the secondary flight plan, and no flight crew action is required.
After engine start, or if the SEC F-PLN is not empty, the flight crew must manually insert the uplinked flight plan via the INSERT UPLINK prompt.

PROCEDURE TO INSERT OR REJECT A SECONDARY FLIGHT PLAN

When the uplink message is received, the INIT REQUEST prompt of INIT A page is replaced by INSERT UPLINK (2R field). Pressing the 2R will insert the flight plan into the secondary one. Clearing the prompt will reject it.

If a temporary flight plan or a DIR TO is in progress, the uplink insertion is not accepted until the temporary flight plan or the DIR TO is completed.



```
              SEC INIT                  →
CO RTE                       FROM/TO
□□□□□□□□□□                   □□□□/□□□□
ALTN/CO RTE                        INIT
----/----------             RESQUEST*
FLT NBR
□□□□□□□□
LAT                                LONG
----.-,----                 -----.--.--
COST INDEX
---                               WIND>
CRZ FL/TEMP                       TROPO
----- /---°                       36090
AOC SEC F-PLN UPLINK
```

```
              SEC INIT                  →
CO RTE                       FROM/TO
□□□□□□□□□□                   □□□□/□□□□
ALTN/CO RTE                      INSERT
----/----------                 UPLINK*
FLT NBR
□□□□□□□□
LAT                                LONG
----.-,----                 -----.--.--
COST INDEX
---                               WIND>
CRZ FL/TEMP                       TROPO
----- /---°                       36090
UPLINK INSERT IN PROG
```

```
              SEC INIT                  →
CO RTE                       FROM/TO
20441                        LSGG/LGAT
ALTN/CO RTE                        INIT
LGTS                           REQUEST*
FLT NBR
AI101
LAT                                LONG
4612 0N                        00727.2E
COST INDEX
540                               WIND>
CRZ FL/TEMP                       TROPO
FL290/-42°                        36090
```

TAKEOFF DATA

Ident.: DSC-22_20-70-A-00001383.0001001 / 07 FEB 11
Applicable to: ALL

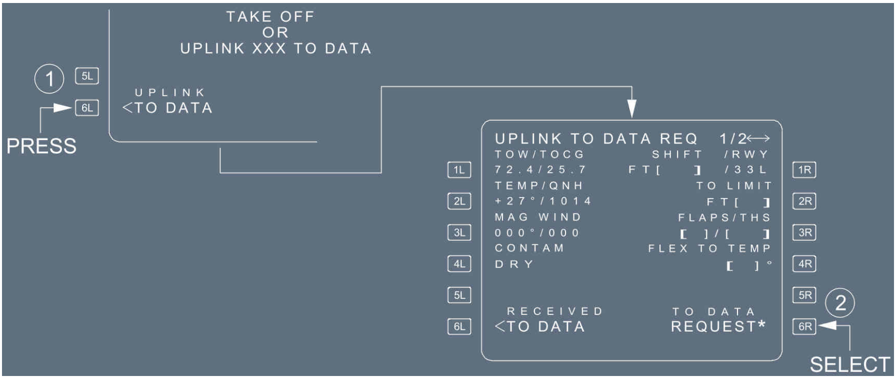
The takeoff data may be requested in preflight or done phase for the active flight plan only. It is always associated with the active flight plan message.

Ident.: DSC-22_20-70-A-00005782.0001001 / 07 FEB 11
Applicable to: ALL

REQUEST FOR TAKEOFF DATA

In order to obtain takeoff data from the ground station:

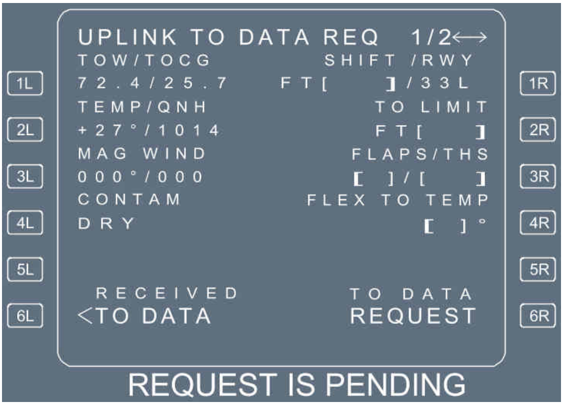
SELECT the PERF TAKEOFF page or UPLINK XX TO DATA page.
PRESS the [6L].
SEND the request by pressing “TO DATA REQUEST” [6R].



UPLINK
<TO DATA

UPLINK TO DATA REQ 1/2←→
TOW/TOCG SHIFT /RWY
72.4/25.7 FT[ ] /33L
TEMP/QNH TO LIMIT
+27°/1014 FT[ ]
MAG WIND FLAPS/THS
000°/000 [ ]/[ ]
CONTAM FLEX TO TEMP
DRY [ ]°
RECEIVED TO DATA
<TO DATA REQUEST*

When TO DATA REQUEST is sent, data of the TO DATA REQ page are locked in and the star displayed on 6R field is removed.

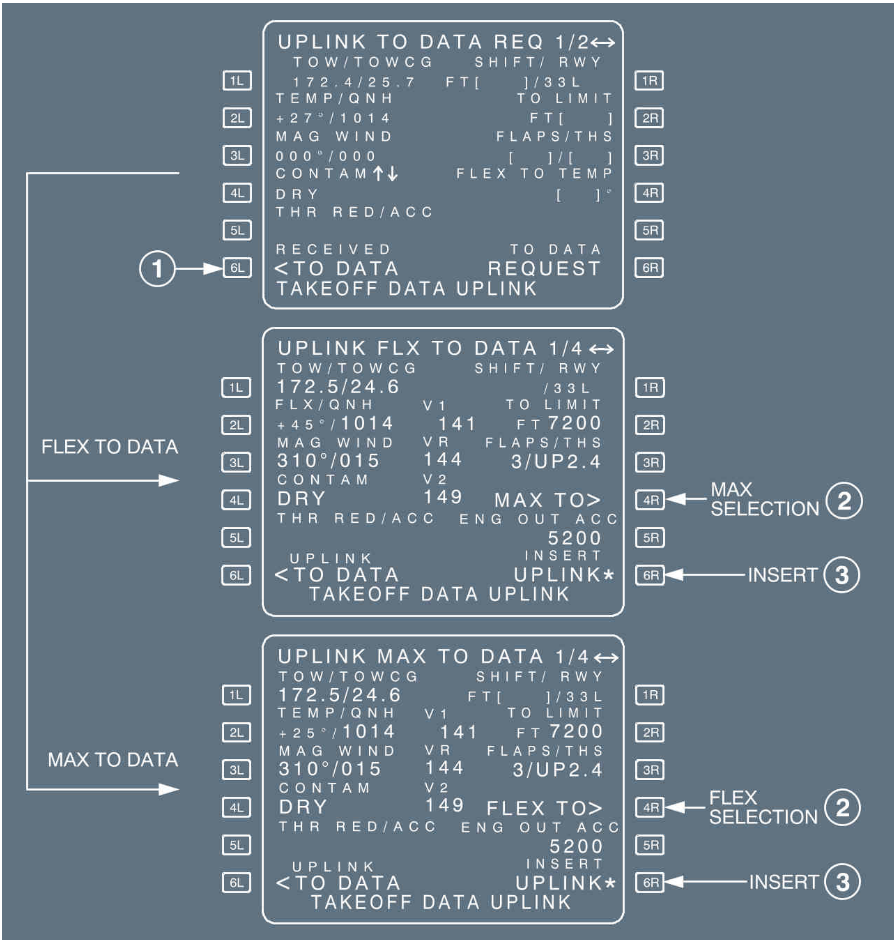


```
UPLINK TO DATA REQ    1/2←→
TOW/TOCG          SHIFT /RWY
72.4/25.7     FT[      ]/33L
TEMP/QNH            TO LIMIT
+27°/1014          FT[     ]
MAG WIND          FLAPS/THS
000°/000         [  ]/[    ]
CONTAM         FLEX TO TEMP
DRY                  [   ]°


  RECEIVED          TO DATA
<TO DATA            REQUEST
REQUEST IS PENDING
```

Ident.: DSC-22_20-70-A-00005783.0001001 / 19 DEC 12
Applicable to: LV-GKO, LV-GKP

PROCEDURE TO INSERT OR DELETE UPLINK TAKEOFF DATA

PRESS the 6L “RECEIVED TO DATA” when the message TAKEOFF DATA UPLINK is displayed.



```
UPLINK TO DATA REQ 1/2↔
 TOW/TOWCG          SHIFT/ RWY
 172.4/25.7      FT[     ]/33L
TEMP/QNH              TO LIMIT
+27°/1014               FT[   ]
MAG WIND            FLAPS/THS
000°/000             [   ]/[   ]
CONTAM↑↓          FLEX TO TEMP
DRY                      [   ]°
THR RED/ACC

RECEIVED               TO DATA
<TO DATA               REQUEST
TAKEOFF DATA UPLINK
```

```
UPLINK FLX TO DATA 1/4↔
TOW/TOWCG           SHIFT/ RWY
172.5/24.6                /33L
FLX/QNH      V1       TO LIMIT
+45°/1014    141       FT7200
MAG WIND     VR      FLAPS/THS
310°/015     144      3/UP2.4
CONTAM       V2
DRY          149      MAX TO>
THR RED/ACC       ENG OUT ACC
                         5200
  UPLINK                INSERT
<TO DATA              UPLINK*
   TAKEOFF DATA UPLINK
```

```
UPLINK MAX TO DATA 1/4↔
TOW/TOWCG           SHIFT/ RWY
172.5/24.6       FT[     ]/33L
TEMP/QNH     V1       TO LIMIT
+25°/1014    141       FT7200
MAG WIND     VR      FLAPS/THS
310°/015     144      3/UP2.4
CONTAM       V2
DRY          149     FLEX TO>
THR RED/ACC       ENG OUT ACC
                         5200
  UPLINK                INSERT
<TO DATA              UPLINK*
   TAKEOFF DATA UPLINK
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
①
FLEX TO DATA
MAX TO DATA
MAX SELECTION ②
INSERT ③
FLEX SELECTION ②
INSERT ③

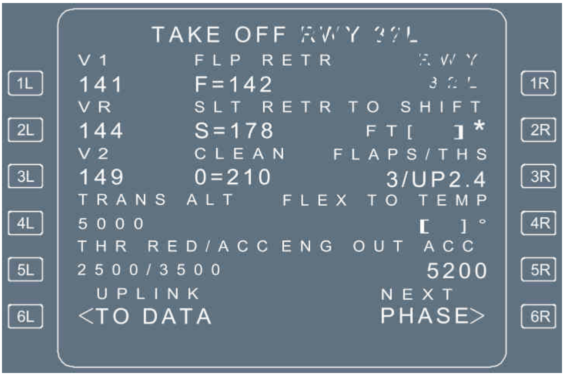
This displays the uplink data on 2 different page : UPLINK MAX TO DATA
UPLINK FLX TO DATA

SELECT the data corresponding to the thrust to be used (MAX or FLEX or DERATED) by pressing [4R]
SELECT the active runway data by slewing the pages (1/4... 4/4).
PRESS the [6R] “INSERT UPLINK”

UPLINK MAX TO DATA, UPLINK FLX TO DATA and UPLINK DERATED TO DATA pages are not modifiable.

If the takeoff data displayed on this page are not relevant to the active runway entered in the flight plan, the INSERT UPLINK prompt is not displayed.

When the takeoff data have been inserted, the PERF TO page is amended of the new data.



```
         TAKE OFF RWY 32L
V1          FLP RETR          RWY
141         F=142             32L
VR          SLT RETR TO SHIFT
144         S=178          FT[   ]*
V2          CLEAN      FLAPS/THS
149         0=210         3/UP2.4
TRANS ALT        FLEX TO TEMP
5000                       [  ]°
THR RED/ACC ENG OUT ACC
2500/3500                  5200
  UPLINK               NEXT
<TO DATA               PHASE>
```

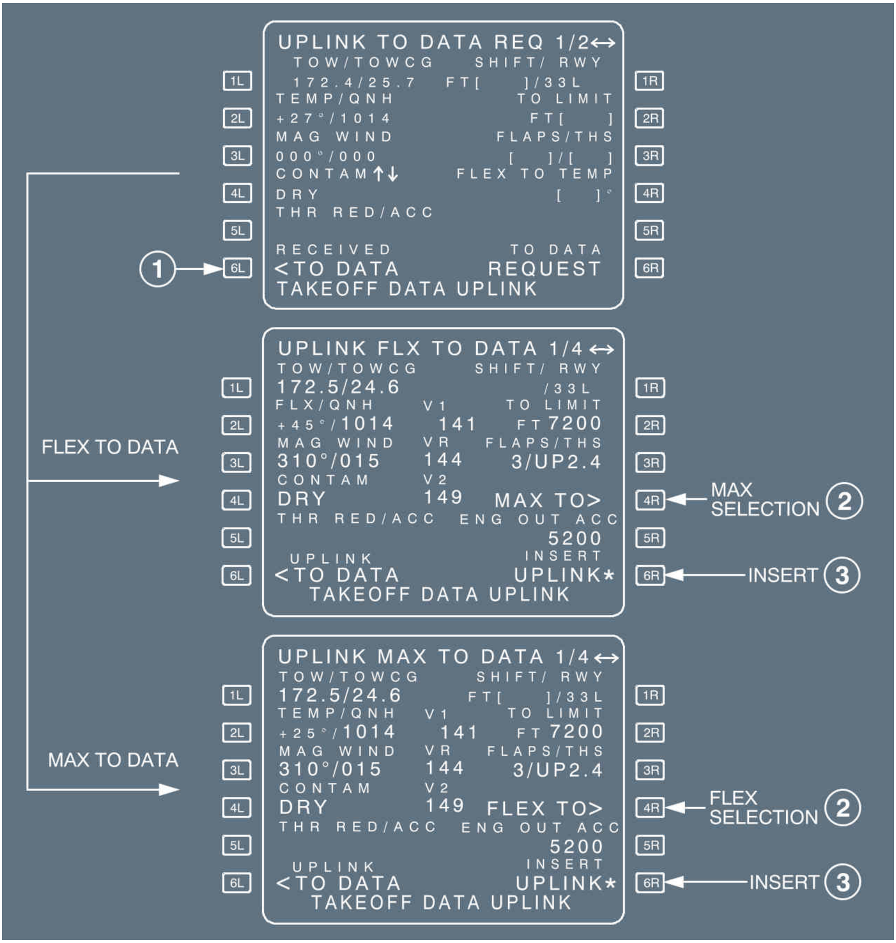
Note: *When the flight crew inserts takeoff data that contains the takeoff runway wind, the wind is automatically inserted as ground wind on the CLIMB WIND page, and the FMS no longer considers the TRIP WIND inserted on the INIT B page.*

Ident.: DSC-22_20-70-A-00005783.0003001 / 19 DEC 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

PROCEDURE TO INSERT OR DELETE UPLINK TAKEOFF DATA

PRESS the 6L “RECEIVED TO DATA” when the message TAKEOFF DATA UPLINK is displayed.



```
UPLINK TO DATA REQ 1/2↔
 TOW/TOWCG        SHIFT/ RWY
 172.4/25.7    FT[     ]/33L
TEMP/QNH            TO LIMIT
+27°/1014            FT[    ]
MAG WIND           FLAPS/THS
000°/000         [   ]/[   ]
CONTAM↑↓        FLEX TO TEMP
DRY                  [    ]°
THR RED/ACC

RECEIVED             TO DATA
<TO DATA             REQUEST
TAKEOFF DATA UPLINK
```

```
UPLINK FLX TO DATA 1/4↔
TOW/TOWCG          SHIFT/ RWY
172.5/24.6               /33L
FLX/QNH      V1      TO LIMIT
+45°/1014    141      FT7200
MAG WIND     VR     FLAPS/THS
310°/015     144      3/UP2.4
CONTAM       V2
DRY          149      MAX TO>
THR RED/ACC      ENG OUT ACC
                        5200
 UPLINK               INSERT
<TO DATA             UPLINK*
  TAKEOFF DATA UPLINK
```

```
UPLINK MAX TO DATA 1/4↔
TOW/TOWCG          SHIFT/ RWY
172.5/24.6       FT[    ]/33L
TEMP/QNH     V1      TO LIMIT
+25°/1014    141      FT7200
MAG WIND     VR     FLAPS/THS
310°/015     144      3/UP2.4
CONTAM       V2
DRY          149     FLEX TO>
THR RED/ACC      ENG OUT ACC
                        5200
 UPLINK               INSERT
<TO DATA             UPLINK*
  TAKEOFF DATA UPLINK
```

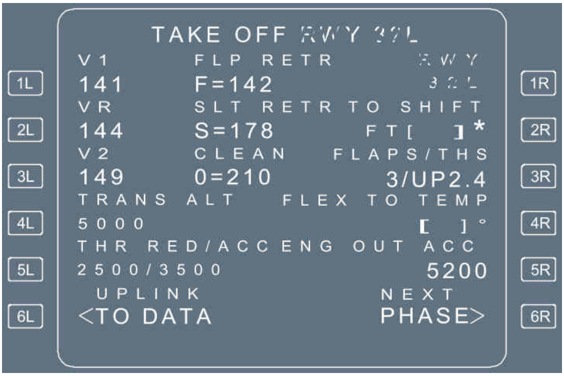
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
①
FLEX TO DATA
MAX TO DATA
MAX SELECTION ②
INSERT ③
FLEX SELECTION ②
INSERT ③

This displays the uplink data on 2 different page : UPLINK MAX TO DATA
UPLINK FLX TO DATA

SELECT the data corresponding to the thrust to be used (MAX or FLEX or DERATED) by pressing [4R]
SELECT the active runway data by slewing the pages (1/4... 4/4).
PRESS the [6R] “INSERT UPLINK”

UPLINK MAX TO DATA, UPLINK FLX TO DATA and UPLINK DERATED TO DATA pages are not modifiable.

If the takeoff data displayed on this page are not relevant to the active runway entered in the flight plan, the INSERT UPLINK prompt is not displayed.
When the takeoff data have been inserted, the PERF TO page is amended of the new data.



```
       TAKE OFF RWY 32L
V1        FLP RETR          RWY
141       F=142             32L
VR        SLT RETR TO SHIFT
144       S=178          FT[    ]*
V2        CLEAN     FLAPS/THS
149       0=210        3/UP2.4
TRANS ALT      FLEX TO TEMP
5000                   [   ]°
THR RED/ACC ENG OUT ACC
2500/3500               5200
  UPLINK              NEXT
<TO DATA             PHASE>
```

WIND DATA

Ident.: DSC-22_20-70-B-00001384.0001001 / 07 FEB 11
Applicable to: ALL

REQUEST FOR WIND DATA

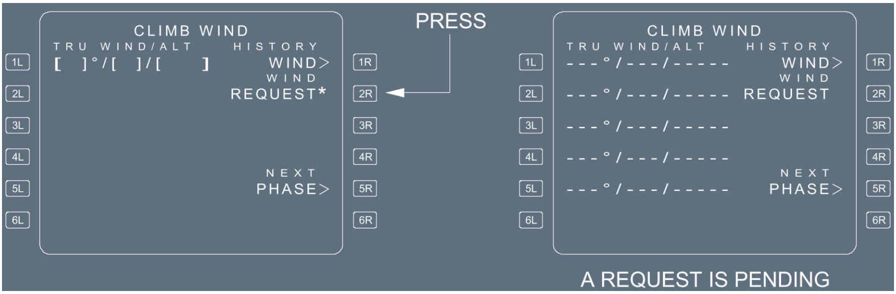
To send a wind request, press the “WIND REQUEST” selection key of any of wind pages. This request is automatically sent to the ground for one or more flight phases and for the selected flight plan (primary or secondary). The content of the wind request message is not dependent on the selected wind page (CLIMB, CRUISE or DESCENT) but on the flight phase in progress.

- For the active flight plan or the secondary flight plan that is a “COPY ACTIVE”, a wind request sent by the crew:
  - During the preflight or takeoff phase, initiates a demand for climb, cruise, descent and alternate winds.
  - During climb and cruise phase, initiates a demand for cruise, descent and alternate winds.
  - During descent/approach and go around, no wind request is possible.
- For a secondary flight plan that is not a “COPY ACTIVE” there is no restriction linked to flight phase.

For both the active and secondary flight plan:

Before engine start, and if data has not been entered in any WIND page for the flight plan, the uplinked wind data is automatically inserted into the flight plan, and no flight crew action is required.

If the uplinked wind message is received after engine start, or if data has been entered in any WIND page of the flight plan, the flight crew must manually insert the uplinked wind data via the INSERT UPLINK prompt.



When the amber star following the “WIND REQUEST” is not displayed, the FM is not able to communicate with the ACARS and the flight crew cannot send any request. When a temporary flight plan is active or a DIR TO is selected, an uplink message cannot be displayed and the “WIND UPLINK PENDING” scratchpad message remains displayed until the action is completed.

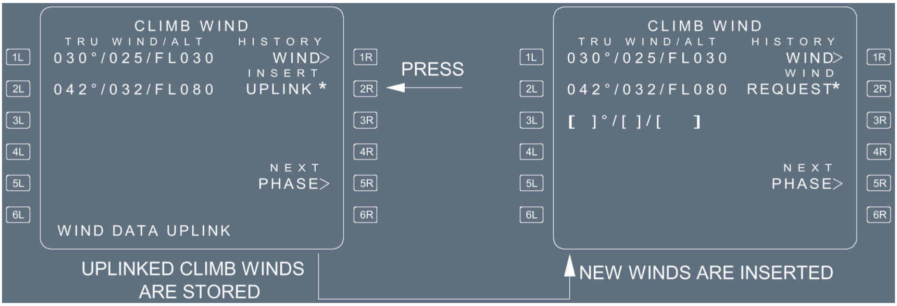
Ident.: DSC-22_20-70-B-00005784.0001001 / 03 NOV 21
Applicable to: LV-GKO, LV-GKP

PROCEDURE TO INSERT WIND DATA

When the uplink message is received, the 2R field is modified, the amber “WIND REQUEST” is replaced by the blue “INSERT UPLINK*”. This prompt, when pressed, enables the flight crew to insert the uplink wind data, phase by phase.

To access, review, insert or delete the uplink wind data of other phases, the flight crew uses the “NEXT PHASE” or “PREV PHASE” key.

If the flight crew is not satisfied with the uplink winds, the flight crew delete the winds, phase by phase clearing the “INSERT UPLINK” prompt. This will delete all the uplinked winds of the selected flight phase.


CLIMB WIND
TRU WIND/ALT
HISTORY
030°/025/FL030
WIND>
INSERT
042°/032/FL080
UPLINK *
NEXT
PHASE>
WIND DATA UPLINK
PRESS
CLIMB WIND
TRU WIND/ALT
HISTORY
030°/025/FL030
WIND>
WIND
042°/032/FL080
REQUEST*
[ ]°/[ ]/[ ]
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

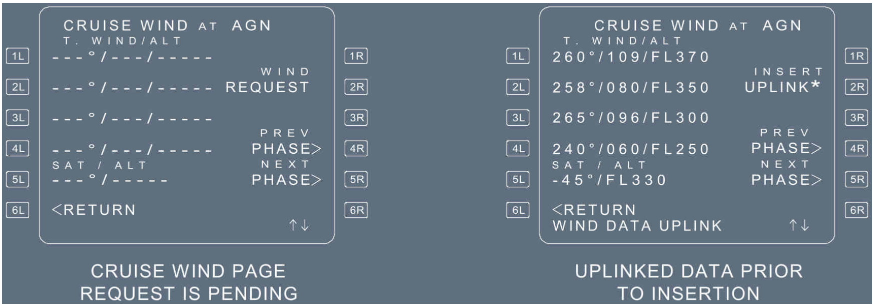
UPLINKED CLIMB WINDS ARE STORED

NEW WINDS ARE INSERTED

CLIMB WIND PAGE

When a request is pending, the history WIND page cannot be accessed.
When the climb phase is active, the flight crew cannot request neither modify the climb winds of the active flight plan or secondary flight plan if it is a copy active.

CRUISE WIND PAGE


CRUISE WIND AT AGN
T. WIND/ALT
---°/---/-----
WIND
---°/---/-----
REQUEST
---°/---/-----
PREV
---°/---/-----
PHASE>
SAT / ALT
NEXT
---°/-----
PHASE>
<RETURN
↑↓
CRUISE WIND AT AGN
T. WIND/ALT
260°/109/FL370
INSERT
258°/080/FL350
UPLINK*
265°/096/FL300
PREV
240°/060/FL250
PHASE>
SAT / ALT
NEXT
-45°/FL330
PHASE>
<RETURN
WIND DATA UPLINK
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

CRUISE WIND PAGE REQUEST IS PENDING

UPLINKED DATA PRIOR TO INSERTION

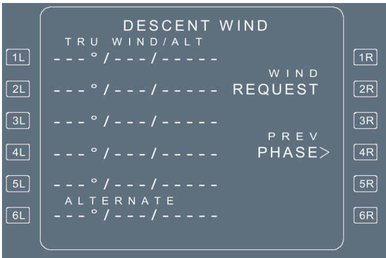
A wind request sent during the cruise phase will apply to downpath waypoints of the cruise, descent, approach and alternate phases.

- If the uplink message contains more data and waypoints than the flight plan, the winds at extra waypoints are not considered and are automatically discarded. This is transparent to the flight crew.
- Clearing the INSERT UPLINK* prompt deletes all uplink wind data of the CRUISE phase. The CRUISE page reverts to the previous data.

Note: *During cruise, whenever uplink wind data is received and not inserted or cancelled CRUISE WIND page, access to the DIR TO function is not possible. The "WIND UPLINK EXISTS" message is displayed on the MCDU scratchpad.*
Insert or cancel the uplinked wind message first and then access the DIR TO function.

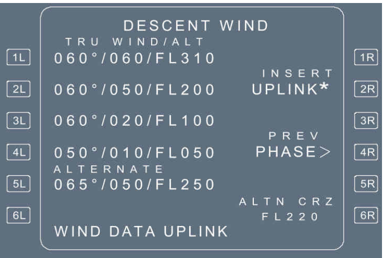
DESCENT WIND PAGE

The procedures to insert, review or delete descent winds during preflight, climb or cruise phase are described in the above wind general procedure.
In descent, approach or Go-around phases, the flight crew cannot request or modify the descent winds of the active flight plan or secondary flight plan if it is a “COPY ACTIVE”.



```
        DESCENT WIND
  TRU  WIND/ALT
1L ---°/---/-----                 1R
                       WIND
2L ---°/---/-----   REQUEST       2R
3L ---°/---/-----                 3R
                       PREV
4L ---°/---/-----    PHASE>       4R
5L ---°/---/-----                 5R
  ALTERNATE
6L ---°/---/-----                 6R
```

DESCENT WIND PAGE
REQUEST IS PENDING



```
        DESCENT WIND
  TRU  WIND/ALT
1L 060°/060/FL310                 1R
                      INSERT
2L 060°/050/FL200   UPLINK*       2R
3L 060°/020/FL100                 3R
                       PREV
4L 050°/010/FL050    PHASE>       4R
   ALTERNATE
5L 065°/050/FL250                 5R
                    ALTN  CRZ
6L                     FL220      6R
   WIND DATA UPLINK
```

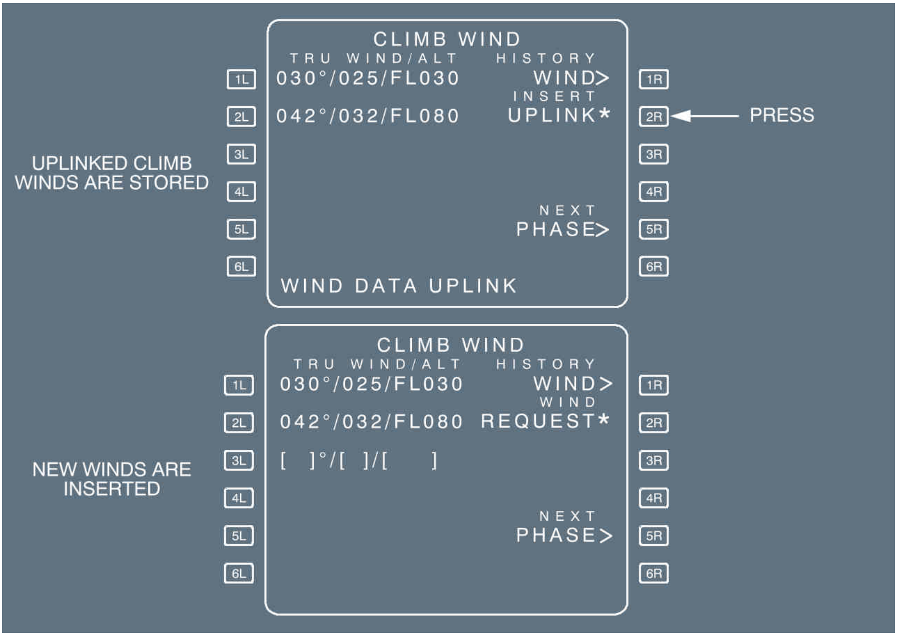
UPLINKED DATA
PRIOR TO INSERTION

If the alternate wind is not available, dashes are displayed in the field.

Ident.: DSC-22_20-70-B-00005784.0004001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

PROCEDURE TO INSERT WIND DATA

When the uplink message is received, the 2R field is modified, the amber “WIND REQUEST” is replaced by the blue “INSERT UPLINK*”. This prompt, when pressed, enables the flight crew to insert the uplink wind data, phase by phase.
To access, review, insert or delete the uplink wind data of other phases, the flight crew uses the “NEXT PHASE” or “PREV PHASE” key.
If the flight crew is not satisfied with the uplink winds, the flight crew delete the winds, phase by phase clearing the “INSERT UPLINK” prompt. This will delete all the uplinked winds of the selected flight phase.



```
           CLIMB WIND
  TRU WIND/ALT         HISTORY
030°/025/FL030           WIND>
                        INSERT
042°/032/FL080         UPLINK*




                          NEXT
                        PHASE>

WIND DATA UPLINK
```

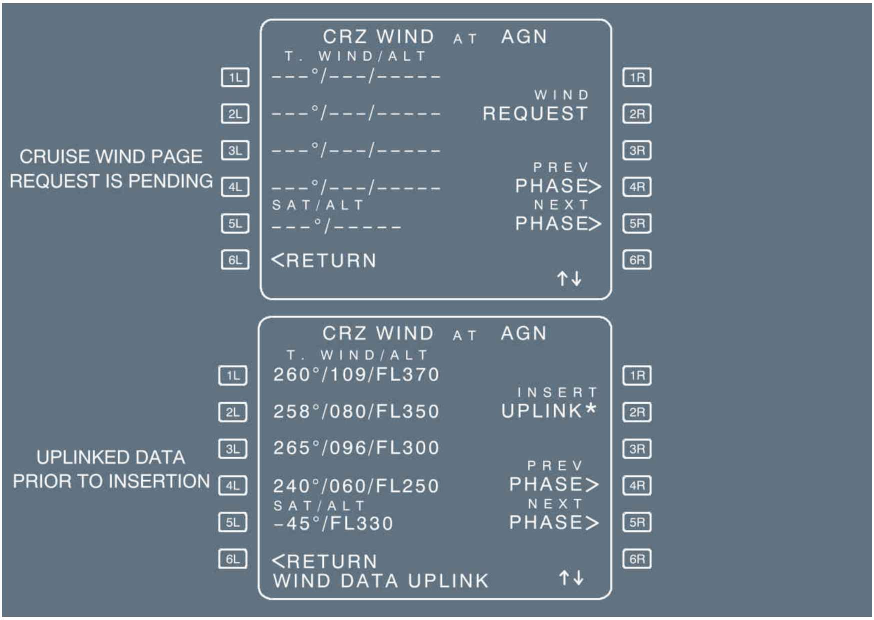
```
           CLIMB WIND
  TRU WIND/ALT         HISTORY
030°/025/FL030           WIND>
                          WIND
042°/032/FL080 REQUEST*
[   ]°/[  ]/[     ]


                          NEXT
                        PHASE>
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
PRESS
UPLINKED CLIMB WINDS ARE STORED
NEW WINDS ARE INSERTED

CLIMB WIND PAGE

When a request is pending, the history WIND page cannot be accessed.
When the climb phase is active, the flight crew cannot request neither modify the climb winds of the active flight plan or secondary flight plan if it is a copy active.

CRZ WIND PAGE



CRUISE WIND PAGE REQUEST IS PENDING

```
      CRZ WIND  AT  AGN
 T. WIND/ALT
---°/---/-----
                        WIND
---°/---/-----       REQUEST
---°/---/-----
                        PREV
---°/---/-----        PHASE>
SAT/ALT                 NEXT
---°/-----            PHASE>
<RETURN
                          ↑↓
```

UPLINKED DATA PRIOR TO INSERTION

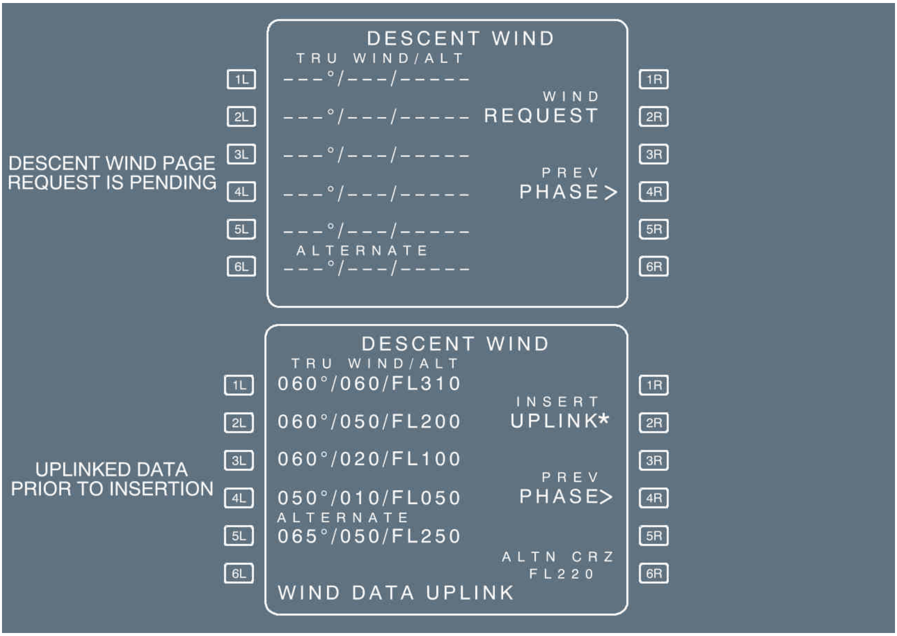
```
      CRZ WIND  AT  AGN
 T. WIND/ALT
260°/109/FL370
                      INSERT
258°/080/FL350       UPLINK*
265°/096/FL300
                        PREV
240°/060/FL250        PHASE>
SAT/ALT                 NEXT
-45°/FL330            PHASE>
<RETURN
WIND DATA UPLINK          ↑↓
```

A wind request sent during the cruise phase will apply to downpath waypoints of the cruise, descent, approach and alternate phases.

- If the uplink message contains more data and waypoints than the flight plan, the winds at extra waypoints are not considered and are automatically discarded. This is transparent to the flight crew.
- Clearing the INSERT UPLINK* prompt deletes all uplink wind data of the CRUISE phase. The CRZ WIND page reverts to the previous data.

DESCENT WIND PAGE

The procedures to insert, review or delete descent winds during preflight, climb or cruise phase are described in the above wind general procedure.
In descent, approach or Go-around phases, the flight crew cannot request or modify the descent winds of the active flight plan or secondary flight plan if it is a “COPY ACTIVE”.



DESCENT WIND PAGE REQUEST IS PENDING
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
         DESCENT WIND
  TRU WIND/ALT
---°/---/-----
                        WIND
---°/---/-----       REQUEST
---°/---/-----
                        PREV
---°/---/-----        PHASE>
---°/---/-----
  ALTERNATE
---°/---/-----
```

UPLINKED DATA PRIOR TO INSERTION
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
         DESCENT WIND
  TRU WIND/ALT
060°/060/FL310
                      INSERT
060°/050/FL200       UPLINK*
060°/020/FL100
                        PREV
050°/010/FL050        PHASE>
ALTERNATE
065°/050/FL250
                     ALTN CRZ
                       FL220
WIND DATA UPLINK
```

If the alternate wind is not available, dashes are displayed in the field.

Intentionally left blank

GENERAL

Ident.: DSC-22_20-80-00001385.0001001 / 01 APR 11
Applicable to: ALL

The PRINT function allows various reports to be printed either automatically (when linked to ACARS or ATSU ◁) or manually.

The manual PRINT function allows printing of FM-generated flight reports and additional data :

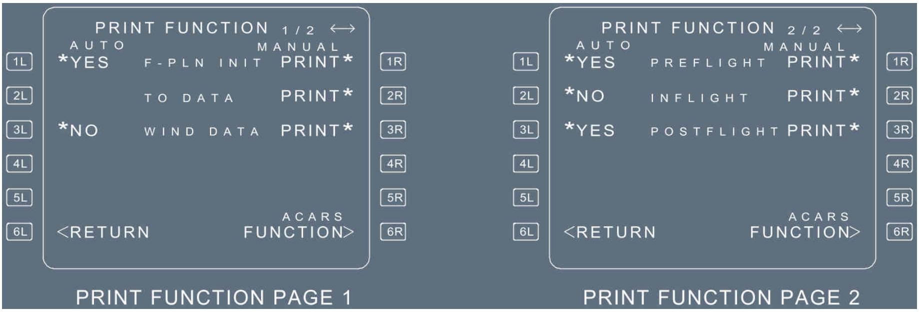
F-PLN	INITialization data
T.O.	Data
WIND	Data
PREFLIGHT	REPORT
IN FLIGHT	REPORT
POSTFLIGHT	REPORT

Refer to DSC / 22_20 Auto Flight - Flight Management / 50 Controls and Indicators / 10 MCDU - Page Description for a detailed description of the PRINT FUNCTION pages.
The print function is available whether ACARS or ATSU ◁ are available or not.
The various flight reports collect most of the prediction information required by the crew to monitor the progress of the flight. The resulting documents may thus be used as realistic master documents, based on the latest data provided by the crew to the computer in terms of ATC clearances and weather information.

PRINT FUNCTION ACCESS

Ident.: DSC-22_20-80-00001386.0001001 / 24 JAN 11
Applicable to: ALL

The PRINT FUNCTION page is accessed :
- From the DATA INDEX A PAGE, or
- From the ACARS FUNCTION page (if ACARS is installed).


PRINT FUNCTION 1/2 ⟷
AUTO
MANUAL
*YES
F-PLN INIT
PRINT*
TO DATA
PRINT*
*NO
WIND DATA
PRINT*
<RETURN
ACARS
FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
PRINT FUNCTION 2/2 ⟷
AUTO
MANUAL
*YES
PREFLIGHT
PRINT*
*NO
INFLIGHT
PRINT*
*YES
POSTFLIGHT
PRINT*
<RETURN
ACARS
FUNCTION>

PRINT FUNCTION PAGE 1

PRINT FUNCTION PAGE 2

Note: *For automatic printing, "time" is the time of the reception of the message. For a manual printing, "time" is the time of the print request.*

ON GROUND BEFORE ENGINE START

Ident.: DSC-22_20-80-00001387.0001001 / 24 JAN 11
Applicable to: ALL

When the overall F-PLN data (lateral, vertical including winds, steps, constraints) and the ZFW and ZFWCG values have been inserted :

SELECT the FUEL PLANNING prompt [3R]

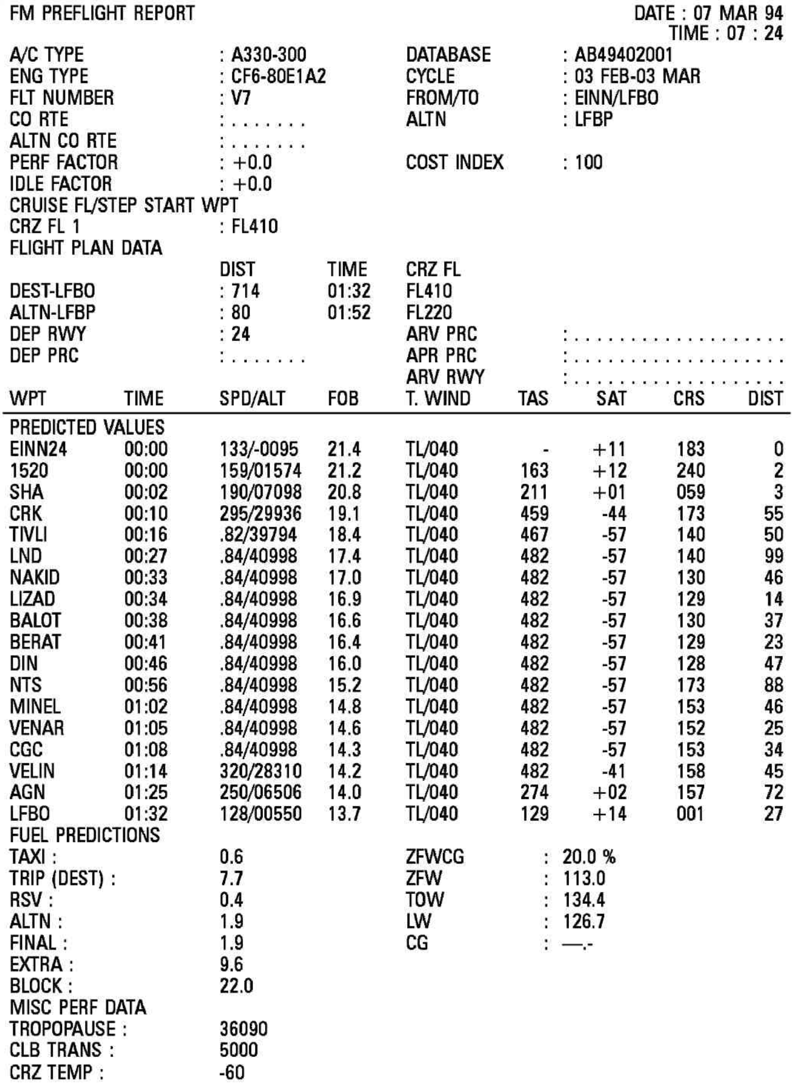
- **If the computed BLOCK fuel does not correspond to the actual block fuel required for the flight :**
  ENTER the actual block fuel required for the flight in the [2R] field
  PRINT the PREFLIGHT REPORT

  The flight crew may then use the PREFLIGHT report to monitor the progress of the flight.

  Note: *Before printing the PREFLIGHT report, the flight crew must check that the F-PLN is complete (all F-PLN discontinuities must be cleared) and that all the F-PLN elements (including winds, steps, constraints, alternate airport) have been inserted, in order to obtain an accurate PREFLIGHT report.*

EXAMPLE FM PREFLIGHT REPORT

Ident.: DSC-22_20-80-00001388.0001001 / 16 MAR 11



```
FM PREFLIGHT REPORT                                                  DATE : 07 MAR 94
                                                                        TIME : 07 : 24
A/C TYPE              : A330-300          DATABASE      : AB49402001
ENG TYPE              : CF6-80E1A2        CYCLE         : 03 FEB-03 MAR
FLT NUMBER            : V7                FROM/TO       : EINN/LFBO
CO RTE                : . . . . . . .     ALTN          : LFBP
ALTN CO RTE           : . . . . . . .
PERF FACTOR           : +0.0              COST INDEX    : 100
IDLE FACTOR           : +0.0
CRUISE FL/STEP START WPT
CRZ FL 1              : FL410
FLIGHT PLAN DATA
                        DIST      TIME    CRZ FL
DEST-LFBO             : 714       01:32   FL410
ALTN-LFBP             : 80        01:52   FL220
DEP RWY               : 24                ARV PRC       : . . . . . . . . . . . . . . . . . .
DEP PRC               : . . . . . . .     APR PRC       : . . . . . . . . . . . . . . . . . .
                                          ARV RWY       : . . . . . . . . . . . . . . . . . .
WPT        TIME       SPD/ALT     FOB     T. WIND    TAS     SAT     CRS     DIST
---------------------------------------------------------------------------------
PREDICTED VALUES
EINN24     00:00      133/-0095   21.4    TL/040      -      +11     183        0
1520       00:00      159/01574   21.2    TL/040     163     +12     240        2
SHA        00:02      190/07098   20.8    TL/040     211     +01     059        3
CRK        00:10      295/29936   19.1    TL/040     459     -44     173       55
TIVLI      00:16      .82/39794   18.4    TL/040     467     -57     140       50
LND        00:27      .84/40998   17.4    TL/040     482     -57     140       99
NAKID      00:33      .84/40998   17.0    TL/040     482     -57     130       46
LIZAD      00:34      .84/40998   16.9    TL/040     482     -57     129       14
BALOT      00:38      .84/40998   16.6    TL/040     482     -57     130       37
BERAT      00:41      .84/40998   16.4    TL/040     482     -57     129       23
DIN        00:46      .84/40998   16.0    TL/040     482     -57     128       47
NTS        00:56      .84/40998   15.2    TL/040     482     -57     173       88
MINEL      01:02      .84/40998   14.8    TL/040     482     -57     153       46
VENAR      01:05      .84/40998   14.6    TL/040     482     -57     152       25
CGC        01:08      .84/40998   14.3    TL/040     482     -57     153       34
VELIN      01:14      320/28310   14.2    TL/040     482     -41     158       45
AGN        01:25      250/06506   14.0    TL/040     274     +02     157       72
LFBO       01:32      128/00550   13.7    TL/040     129     +14     001       27
FUEL PREDICTIONS
TAXI :                  0.6               ZFWCG       : 20.0 %
TRIP (DEST) :           7.7               ZFW         : 113.0
RSV :                   0.4               TOW         : 134.4
ALTN :                  1.9               LW          : 126.7
FINAL :                 1.9               CG          : —.-
EXTRA :                 9.6
BLOCK :                 22.0
MISC PERF DATA
TROPOPAUSE :            36090
CLB TRANS :             5000
CRZ TEMP :              -60
```

IN FLIGHT

Ident.: DSC-22_20-80-00001389.0002001 / 24 JAN 11
Applicable to: ALL

When the aircraft has reached the CRZ FL, and when all the latest ATC clearances have been inserted in the FM, and when all the WINDS/STEPS have been properly updated:

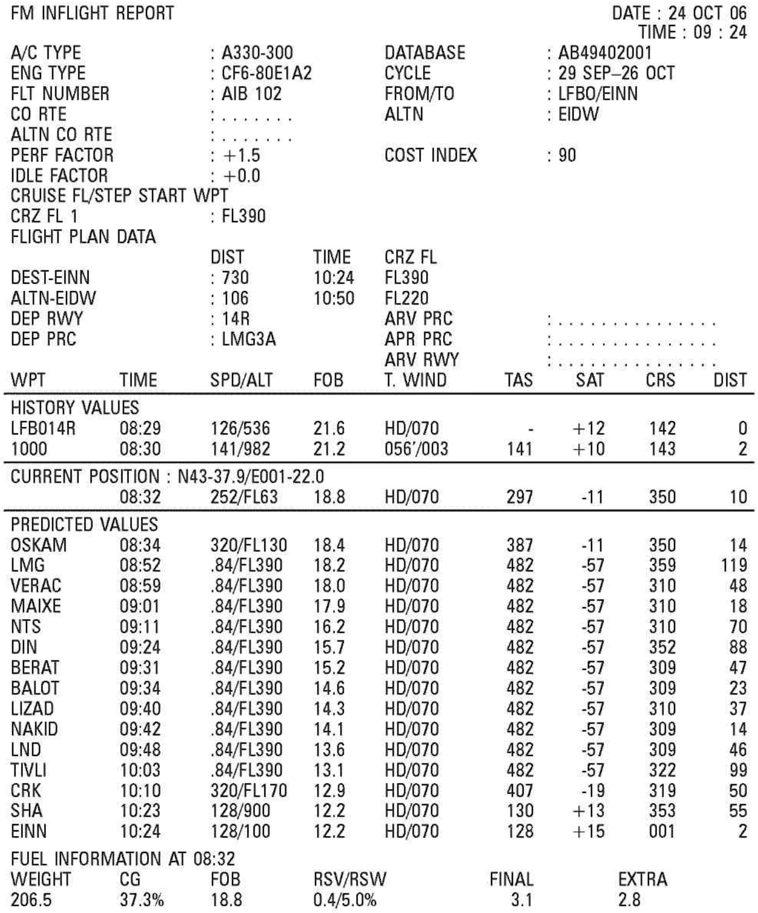
ACCESS to the PRINT FUNCTION page
PRINT the INFLIGHT REPORT

The inflight report provides the list of all the overflown F-PLN waypoints (HISTORY VALUES) with their associated data (Time, Alt, Fuel, ...), and the predictions to all the downpath waypoints (PREDICTED VALUES).
This new document replaces the PREFLIGHT report, since it carries all the latest expected F-PLN changes. It is the new applicable master document used to monitor the progress of the flight.
The inflight report will be printed after each important F-PLN modification.

Note: *If the selected Fuel Unit option is pounds, the HISTORY FOB values may be incorrectly printed in tons on the INFLIGHT REPORT. The CURRENT and PREDICTED FOB values, however, are correctly printed in pounds.*

EXAMPLE FM INFLIGHT REPORT

Ident.: DSC-22_20-80-00001390.0001001 / 24 JAN 11
Applicable to: ALL



```
FM INFLIGHT REPORT                                             DATE : 24 OCT 06
                                                                 TIME : 09 : 24
A/C TYPE              : A330-300        DATABASE         : AB49402001
ENG TYPE              : CF6-80E1A2      CYCLE            : 29 SEP–26 OCT
FLT NUMBER            : AIB 102         FROM/TO          : LFBO/EINN
CO RTE                : . . . . . . .   ALTN             : EIDW
ALTN CO RTE           : . . . . . . .
PERF FACTOR           : +1.5            COST INDEX       : 90
IDLE FACTOR           : +0.0
CRUISE FL/STEP START WPT
CRZ FL 1              : FL390
FLIGHT PLAN DATA
                        DIST      TIME     CRZ FL
DEST-EINN             : 730       10:24    FL390
ALTN-EIDW             : 106       10:50    FL220
DEP RWY               : 14R                ARV PRC          : . . . . . . . . . . . . . . .
DEP PRC               : LMG3A              APR PRC          : . . . . . . . . . . . . . . .
                                           ARV RWY          : . . . . . . . . . . . . . . .
WPT        TIME       SPD/ALT     FOB      T. WIND       TAS      SAT      CRS      DIST
-------------------------------------------------------------------------------------------
HISTORY VALUES
LFB014R    08:29      126/536     21.6     HD/070          -      +12      142         0
1000       08:30      141/982     21.2     056'/003      141      +10      143         2
-------------------------------------------------------------------------------------------
CURRENT POSITION : N43-37.9/E001-22.0
           08:32      252/FL63    18.8     HD/070        297      -11      350        10
-------------------------------------------------------------------------------------------
PREDICTED VALUES
OSKAM      08:34      320/FL130   18.4     HD/070        387      -11      350        14
LMG        08:52      .84/FL390   18.2     HD/070        482      -57      359       119
VERAC      08:59      .84/FL390   18.0     HD/070        482      -57      310        48
MAIXE      09:01      .84/FL390   17.9     HD/070        482      -57      310        18
NTS        09:11      .84/FL390   16.2     HD/070        482      -57      310        70
DIN        09:24      .84/FL390   15.7     HD/070        482      -57      352        88
BERAT      09:31      .84/FL390   15.2     HD/070        482      -57      309        47
BALOT      09:34      .84/FL390   14.6     HD/070        482      -57      309        23
LIZAD      09:40      .84/FL390   14.3     HD/070        482      -57      310        37
NAKID      09:42      .84/FL390   14.1     HD/070        482      -57      309        14
LND        09:48      .84/FL390   13.6     HD/070        482      -57      309        46
TIVLI      10:03      .84/FL390   13.1     HD/070        482      -57      322        99
CRK        10:10      320/FL170   12.9     HD/070        407      -19      319        50
SHA        10:23      128/900     12.2     HD/070        130      +13      353        55
EINN       10:24      128/100     12.2     HD/070        128      +15      001         2
FUEL INFORMATION AT 08:32
WEIGHT     CG         FOB         RSV/RSW               FINAL            EXTRA
206.5      37.3%      18.8        0.4/5.0%                3.1            2.8
```

<u>Note:</u> In case of a major failure such as an engine out, a new print will be done when time permits.

REACHING THE GATE AFTER LANDING

Ident.: DSC-22_20-80-00001391.0003001 / 24 JAN 11
Applicable to: ALL

The POSTFLIGHT REPORT gives a complete list of all the overflown waypoints during the flight (HISTORY VALUES).

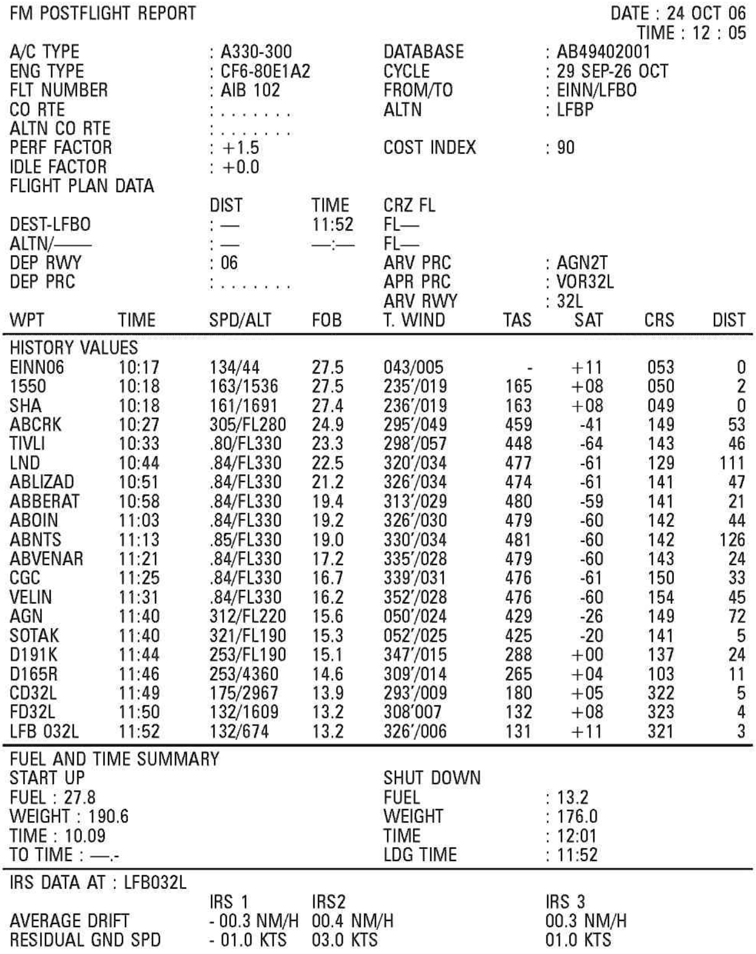
Furthermore it provides:
- FUEL/TIME summary
- IRS Drift and G/S

● **Once at the gate, after engine shutdown:**
ACCESS the PRINT FUNCTION page
PRINT the POST FLIGHT REPORT

Note: *If the selected Fuel Unit option is pounds, the HISTORY FOB values may be incorrectly printed in tons on the POSTFLIGHT REPORT.*

EXAMPLE FM POSTFLIGHT REPORT

Ident.: DSC-22_20-80-00001392.0001001 / 24 JAN 11
Applicable to: ALL



```
FM POSTFLIGHT REPORT                                                  DATE : 24 OCT 06
                                                                     TIME : 12 : 05
A/C TYPE               : A330-300        DATABASE        : AB49402001
ENG TYPE               : CF6-80E1A2      CYCLE           : 29 SEP-26 OCT
FLT NUMBER             : AIB 102         FROM/TO         : EINN/LFBO
CO RTE                 : . . . . . . . . ALTN            : LFBP
ALTN CO RTE            : . . . . . . . .
PERF FACTOR            : +1.5            COST INDEX      : 90
IDLE FACTOR            : +0.0
FLIGHT PLAN DATA
                         DIST    TIME    CRZ FL
DEST-LFBO              : —       11:52   FL—
ALTN/——                : —       —:—     FL—
DEP RWY                : 06              ARV PRC         : AGN2T
DEP PRC                : . . . . . . . . APR PRC         : VOR32L
                                         ARV RWY         : 32L
WPT        TIME        SPD/ALT   FOB     T. WIND      TAS    SAT     CRS     DIST
------------------------------------------------------------------------------------
HISTORY VALUES
EINN06     10:17       134/44     27.5   043/005        -    +11     053        0
1550       10:18       163/1536   27.5   235'/019     165    +08     050        2
SHA        10:18       161/1691   27.4   236'/019     163    +08     049        0
ABCRK      10:27       305/FL280  24.9   295'/049     459    -41     149       53
TIVLI      10:33       .80/FL330  23.3   298'/057     448    -64     143       46
LND        10:44       .84/FL330  22.5   320'/034     477    -61     129      111
ABLIZAD    10:51       .84/FL330  21.2   326'/034     474    -61     141       47
ABBERAT    10:58       .84/FL330  19.4   313'/029     480    -59     141       21
ABOIN      11:03       .84/FL330  19.2   326'/030     479    -60     142       44
ABNTS      11:13       .85/FL330  19.0   330'/034     481    -60     142      126
ABVENAR    11:21       .84/FL330  17.2   335'/028     479    -60     143       24
CGC        11:25       .84/FL330  16.7   339'/031     476    -61     150       33
VELIN      11:31       .84/FL330  16.2   352'/028     476    -60     154       45
AGN        11:40       312/FL220  15.6   050'/024     429    -26     149       72
SOTAK      11:40       321/FL190  15.3   052'/025     425    -20     141        5
D191K      11:44       253/FL190  15.1   347'/015     288    +00     137       24
D165R      11:46       253/4360   14.6   309'/014     265    +04     103       11
CD32L      11:49       175/2967   13.9   293'/009     180    +05     322        5
FD32L      11:50       132/1609   13.2   308'007      132    +08     323        4
LFB 032L   11:52       132/674    13.2   326'/006     131    +11     321        3
------------------------------------------------------------------------------------
FUEL AND TIME SUMMARY
START UP                                 SHUT DOWN
FUEL : 27.8                              FUEL            : 13.2
WEIGHT : 190.6                           WEIGHT          : 176.0
TIME : 10.09                             TIME            : 12:01
TO TIME : —.-                            LDG TIME        : 11:52
------------------------------------------------------------------------------------
IRS DATA AT : LFB032L
                         IRS 1       IRS2                IRS 3
AVERAGE DRIFT          - 00.3 NM/H  00.4 NM/H            00.3 NM/H
RESIDUAL GND SPD       - 01.0 KTS   03.0 KTS             01.0 KTS
```

HOW TO CHANGE T.O DATA OR DEPARTURE RUNWAY AFTER REJECTED TAKEOFF

Ident.: DSC-22_20-85-00023458.0001001 / 28 MAY 20
Applicable to: ALL

GENERAL

This chapter provides an operational recommendation to the flight crew, on how to modify the FMS T.O DATA or departure runway after a rejected takeoff.

DESCRIPTION

In case of rejected takeoff (with an aircraft speed above 90 kt or with sufficient thrust), the FMS remains in TAKEOFF phase and the flight crew cannot modify the FMS T.O DATA or departure runway in the active flight plan.

OPERATIONAL RECOMMENDATION

In that case, if the flight crew has to change the FMS T.O DATA or departure runway in the active flight plan, the flight crew should proceed as follows:
- Delete the SEC F-PLN
- Initialize the SEC F-PLN with the new T.O DATA and/or new departure runway
- Activate the SEC F-PLN.

INSERTION OF APPROACH MINIMA

Ident.: DSC-22_20-85-D-00015014.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

QNH USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

This table explains how the flight crew must insert the approach minimum on the MCDU PERF APPR page.

		Guidance Modes			
		LOC G/S CAT II & CAT III approaches	LOC G/S CAT I approaches	FINAL APP	NAV FPA LOC FPA LOC B/C FPA TRK FPA
MCDU PERF APPR page	MDA field	---	DA	DA or MDA	MDA
	DH field	DH or RA	---		
FMA display		“DH XXX”	“MDA XXXX”		

Ident.: DSC-22_20-85-D-00015014.0008001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

QNH USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

This table explains how the flight crew must insert the approach minimum on the MCDU PERF APPR page.

		Guidance Modes			
		LOC G/S CAT II & CAT III approaches	LOC G/S CAT I approaches	FINAL APP	NAV FPA LOC FPA LOC B/C FPA TRK FPA
MCDU PERF APPR page	BARO field	---	DA	DA or MDA	MDA
	RADIO field	DH or RA	---		
FMA display		“RADIO XXX”	“BARO XXXX”		

Ident.: DSC-22_20-85-D-00015016.0001001 / 21 MAR 17
Applicable to: ALL

QFE USE FOR AIRCRAFT NOT EQUIPPED WITH QFE OPTION

The crew should not use QFE on aircraft with a “QNH only” pin programming (incorrect profile computation of the managed vertical modes CLB, DES and FINAL APPR, possible false GPWS warnings in mountainous areas).

AUTOMATIC FMGEC RESET AND RESYNCHRONIZATION

Ident.: DSC-22_20-90-10-A-00011993.0007001 / 28 MAY 20
Applicable to: ALL

FM RESET

When the FM software cannot work properly or receives instructions to perform impossible operations, it automatically resets itself. A resynchronization with the other FM always follows. When the reset is a minor one, the system will recover by itself.

When the reset is a major one:
- Resets recur at short intervals (several in 2 min to 3 min).
- The memories are cleared, leading to the loss of F-PLN, GW, CI, CRZ FL, MCDU-entered speeds and NAVAIDs and to database switching.

CAUTION	If three dual FM resets occur in 2 min, pilot-entered data is lost. If a dual reset is identified, it is recommended that the flight crew does not perform again the last MCDU actions for 1 min (in order to avoid a potential second dual reset, leading to the loss of pilot-entered data).

Ident.: DSC-22_20-90-10-A-00011994.0007001 / 07 FEB 11
Applicable to: ALL

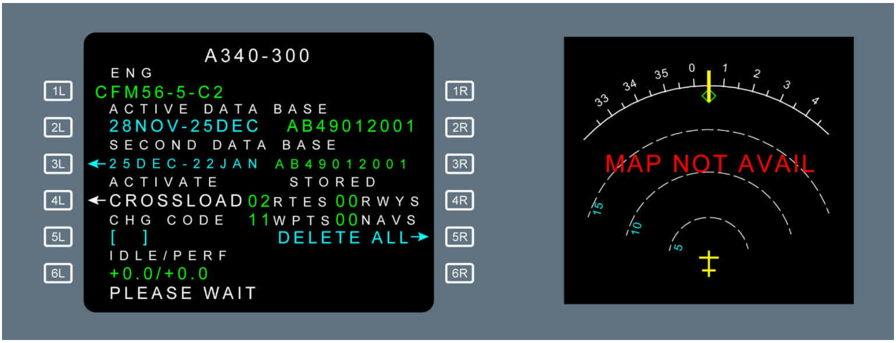
FM RESYNCHRONIZATION

An FM resynchronization automatically occurs after an FM reset but it may occur independently each time self comparisons between FM1 and FM2 reveal discrepancies.
One single resynchronization lasts approximately 25 s.
If several resynchronizations occur within 5 min, independent mode commences.

Ident.: DSC-22_20-90-10-A-00011995.0007001 / 02 JUN 20
Applicable to: ALL

FMGC STATUS DURING A RESET/RESYNCH

While a RESET/RESYNCH occurs:
- The ND shows MAP NOT AVAIL.
- The MCDU reverts to the A/C STATUS page, with PLEASE WAIT displayed in the scratchpad with the FM FAULT light illuminated.
- Autotuning of NAVAIDs (VOR, DME, ADF ◁) are lost on the failed side.
- AP and managed modes may be transiently lost (reversion to HDG / V/S or TRK/FPA).
- If the flight crew presses a key while the scratchpad is showing PLEASE WAIT, there is no change at MCDU level. This behavior is normal. The flight crew should not respond by pulling the MCDU C/B.



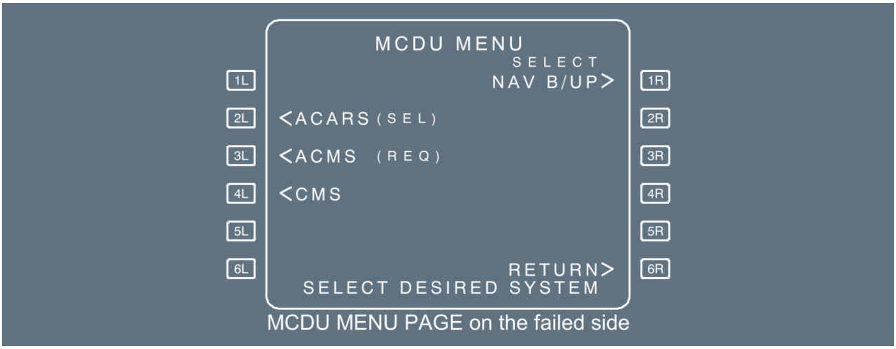
```
A340-300
ENG
CFM56-5-C2
ACTIVE DATA BASE
28NOV-25DEC   AB49012001
SECOND DATA BASE
←25DEC-22JAN  AB49012001
ACTIVATE        STORED
←CROSSLOAD 02RTES 00RWYS
CHG CODE   11WPTS 00NAVS
[  ]          DELETE ALL→
IDLE/PERF
+0.0/+0.0
PLEASE WAIT
```

Ident.: DSC-22_20-90-10-A-00011997.0016001 / 14 JAN 16
Applicable to: ALL

SINGLE LATCH

If 4 successive resets occur, the failing FMGEC will latch and single mode operation commences.

While this is occuring:
- The failed ND side displays “MAP NOT AVAIL” and “SELECT OFFSIDE RNG/MODE” (if the NDs are not both in the same mode or range).
- The MCDU of the failed side displays the MCDU menu, and the FM FAULT light illuminates.
- If AP and FD was previously engaged on the failed side, the AP, FD disengage and the righthand column of the FMA shows that the operating FD is offside.
  ECAM displays the warning “AP OFF” and “FM1(2) FAULT”, and the master warning and audio remind the pilot of the AP disengagement.
- All functions are restored on the operative side



```
MCDU MENU
                    SELECT
                 NAV B/UP>
<ACARS (SEL)
<ACMS  (REQ)
<CMS


                   RETURN>
SELECT DESIRED SYSTEM
```

MCDU MENU PAGE on the failed side

PROCEDURE

- ENGAGE the non affected AP
- ENGAGE managed modes.
- RESET the affected FM with the FMGEC reset breaker on the overhead panel.

● **If successful:**

A resynchronization is launched.

● **If unsuccessful:**

FMGEC operates in single mode:
- PULL the FMGEC reset breaker of the affected FMGEC.
- SELECT FM source BOTH ON 1 or 2.
  Both NDs operate in the range and mode selected on the EFIS control panel corresponding to the FM source.

Ident.: DSC-22_20-90-10-A-00011996.0011001 / 07 FEB 11
Applicable to: ALL

SINGLE RESET OR DUAL RESET WITH AUTORECOVERY

If the RESET/RESYNCH succeeds, all functions are recovered.

PROCEDURE

- RESELECT the convenient MCDU page
- REENGAGE managed modes and AP.
  WAIT 1 min after the “PLEASE-WAIT” message has disappeared before engaging the AP/FD of the failed FMGC.

Ident.: DSC-22_20-90-10-A-00011998.0013001 / 13 DEC 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Three successive dual resets without result, erase all flight crew-entered data (F-PLN, GW, CRZ FL, CI, etc.).

When FMGES recovery is obtained:
- Database cycle may have switched
- The FM position bias is lost. The FM position returns to the MIX IRS position
- Autotuning of VOR/DME are restored, based on the aircraft’s IRS position
- FMGES tuning of the ILS and ADF ◁ is not possible
- Lateral and vertical managed modes cannot reengage
- The CAB PR LDG ELEV FAULT alert is displayed
- The REENTER WEIGHT/CG MCDU message is displayed.

PROCEDURE

When the system has recovered, managed speed may not reengage, because its target would be Green Dot. The PERF/IDLE factor is reset to 00/00. If a PERF/IDLE factor was entered, performance may be slightly modified after recovery.
If the FMGEC remains in Takeoff phase, CHANGE the vertical mode in order to recover the next flight phase.

SELECT the initial database.
SELECT DIR TO the required downpath waypoint.
SELECT LAT REV at the downpath waypoint and redefine DESTINATION.
SELECT the FUEL PRED page and reenter GW and CG values read on the FUEL SD page.
SELECT the PROG page and enter CRZ FL.
SELECT the PERF page and enter CI.
CHECK or REENGAGE (as appropriate) the relevant speed/Mach target and vertical mode.

L2 *Redefine the flight plan for the remainder of the flight.*

L1 PERFORM a NAV accuracy check, when possible.

L2 *The flight crew should consider a manual FM position update, if MIX IRS and actual positions differ by more than 20 NM.*

Ident.: DSC-22_20-90-10-A-00011998.0026001 / 13 DEC 22
Applicable to: LV-KHT, LV-KHU

DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Four successive dual resets in 3 min, erase all flight crew- entered data (F-PLN, GW, CRZ FL, CI, etc.).

When FMGES recovery is obtained:
- The FM position bias is lost. The FM position returns to the MIX IRS position
- Autotuning of VOR/DME are restored, based on IRS position of the aircraft
- FMGES autotuning of the ILS/GLS ◁ and ADF ◁ is not possible
- SLS ◁ is not available
- Lateral and vertical managed modes cannot re-engage
- The CAB PR LDG ELEV FAULT alert is displayed
- A map display may be lost on one ND
- The REENTER ZFW/ZFWCG MCDU message is displayed.

PROCEDURE

When the system has recovered:
If the FMGC remains in Takeoff phase, CHANGE the vertical mode in order to recover the next flight phase.

SELECT DIR TO the required downpath waypoint.

SELECT LAT REV at the downpath waypoint and redefine DESTINATION.
SELECT the FUEL PRED page and enter the ZFW and ZFWCG values.
SELECT the PROG page and enter CRZ FL.
SELECT the PERF page and enter CI.
CHECK or REENGAGE (as appropriate) the relevant speed/Mach target and vertical mode.

L2 *Redefine the flight plan for the remainder of the flight.*

L1 PERFORM a NAV accuracy check, when possible.

L2 *The flight crew should consider a manual FM position update, if MIX IRS and actual positions differ by more than 20 NM.*

Ident.: DSC-22_20-90-10-A-00012016.0006001 / 31 MAR 11
Applicable to: ALL

DUAL LATCH

- Both FMGCs are inoperative. FM and FG capability are lost.
- Both NDs display “MAP NOT AVAILABLE”. NAVAID tuning is not performed.
- AP/FD and A/THR are lost.
- Both MCDUs revert to the MCDU MENU page.
- The following messages are displayed on the ECAM:
  “CAB PR LDG ELEV FAULT”
  “AUTO FLT AP OFF”, if the AP was engaged
  “AUTO FLT A/THR OFF”, if the A/THR was engaged.
- “AUTO FLT FM1 + 2 FAULT”.

PROCEDURE

- FLY raw data.
- TUNE necessary NAVAIDs, using the RMPs.
- Successively RESET both FMGCs, with the FMGEC reset breakers C/B that are located on the overhead panel.

● **If successful, refer to dual reset with loss of data and auto recovery:**

Note: *A recovery will result in the loss of all pilot-entered data.*

● **If unsuccessful:**

- FLY raw data.
- SET the FM source to NORM.
- SELECT the NAV B/UP prompt on both MCDU DATA pages.
  (*Refer to the FCOM Aircraft Systems description (Auto-Flight), concerning navigation backup operation)*.
- SET the landing elevation of the destination on the overhead panel.

Ident.: DSC-22_20-90-10-A-00012017.0001001 / 17 MAR 17
Applicable to: ALL

FMGEC RESET DURING ILS/GLS ◁ APPROACH

- **Above 700 ft AGL:**

  ILS/GLS ◁ tuning may be lost. The loss of ILS/GLS ◁ tuning, due to a dual reset, will cause a loss of the LOC and G/S, and the disengagement of the APs and FDs. In this case:
  - PERFORM a go-around, if not stabilized at 1 000 ft AGL, and if visual references are not acquired.

- **Below 700 ft AGL:**

  A single or double reset does not affect an ILS/GLS ◁ approach below 700 ft AGL. ILS frequency/GLS ◁ channel is locked and AP/FDs remain engaged.
  - CONTINUE the approach.

Ident.: DSC-22_20-90-10-A-00012021.0001001 / 07 FEB 11
Applicable to: ALL

FMGES RESET DURING NON PRECISION APPROACH

During a non ILS approach, if the master FMGC fails, AP/FD and managed modes are lost and FDs engage in basic modes.

- PERFORM a go-around, if not stabilized at 1 000 ft, and if visual references are not acquired.

MANUAL FMGEC RESET

Ident.: DSC-22_20-90-10-00012049.0001001 / 05 MAY 22
Applicable to: ALL

MANUAL RESET OF FMGEC

On rare occasions, the FMGEC may require manual resetting.
If this occurs in flight, reset one FMGEC at a time.

The aircraft has two reset buttons per FMGEC, located on the overhead panel:
- The FM reset button

CAUTION	Do not use the FM reset button.

  Note: *Using the FM button may lead to a failed start of the FMGEC.*

- The FMGEC reset button

  Note: *The FMGEC reset button resets the flight management, flight guidance, and flight envelope parts of the FMGEC.*

Resetting via the FMGEC reset button disconnects the onside autopilot.
Following the reset, the FM resynchronizes with the opposite FM.
Resetting the FMGEC manually via the reset button does not increment the reset counter: there is no limitation to the number of resets commanded manually via the reset buttons.

Note: *Due to electrical transient, MANUAL FMGEC RESET procedure may be unsuccessful. If so and on ground, the flight crew may attempt the same procedure with engines not running.*

Intentionally left blank

ERRONEOUS PREDICTIONS

Ident.: DSC-22_20-90-20-00012041.0001001 / 28 MAY 20
Applicable to: ALL

DESCRIPTION

The FMGES may temporarily display erroneous predictions that can affect such data as ECON speed/Mach, optimum flight level, fuel or time predictions.

OPERATIONAL RECOMMENDATION

The flight crew should not perform a reset of the FMS.

FOR MISSING PREDICTIONS OR OBVIOUS ERRONEOUS PREDICTIONS

To recover the FMS predictions:

1. On the WIND page, the flight crew should verify for each flight level:
   - The temperature value for each cruise waypoint
   - The wind data for each cruise waypoint.

   If some temperature or wind data are erroneous or missing the flight crew should:
   - Update data
   - Check if correct predictions are recovered.
2. In the legs of the Flight Plan, the flight crew should verify:
   - If there is one Flight Plan leg with erroneous predicted distance, or erroneous predicted time or erroneous predicted fuel consumption, and
   - If one Flight Plan leg with erroneous predictions exists, then the flight crew should:
     - Insert an intermediate waypoint
     - Check if correct predictions are recovered.

3. In the arrival procedure of the Flight Plan, the flight crew should verify:
   - If there are two successive waypoints separated by a distance of 3 NM or less, and
   - If one of these two waypoints contains an AT OR BELOW altitude constraint the flight crew should:
     - Insert the same altitude constraint to the lowest waypoint
     - Check if correct predictions are recovered.

FOR SUSPECTED ERRONEOUS PREDICTIONS OR TO FORCE A F-PLN RE-COMPUTATION

If the flight crew suspects that the FMS predictions are erroneous (slow computations, slightly erroneous values, etc.) and if the previous actions remain not successful, in order to recover the FMS predictions, the flight crew should:

- Copy of the ACTIVE F-PLN into a SEC F-PLN
- Remove the STAR procedure of the ACTIVE F-PLN

  Note: *The STAR usually contains a lot of constraints which may disturb FMS predictions computations.*

- Insert again the STAR in the ACTIVE F-PLN, later during the flight.

SPURIOUS ENGINE-OUT INDICATION

Ident.: DSC-22_20-90-20-00012042.0001001 / 17 MAR 17
Applicable to: ALL

PROCEDURE

If a spurious engine-out is detected:

PROCEDURE

- PRESS the EO CLR prompt of the MCDU PERF page
- RE-ENGAGE previous vertical mode
- RE-ENTER preselected speeds (if any).
  No other consequences are to be expected.

INCORRECT MDH AFTER SEC F-PLN ACTIVATION (QFE PIN-PROGRAMMED AIRCRAFT ONLY)

Ident.: DSC-22_20-100-20-00013462.0001001 / 18 MAY 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

If there is a value in the MDH field [2R] of SEC PERF APPR page (manually entered by the flight crew or resulting from a COPY ACTIVE of the active F-PLN), and if the flight crew then activates the SEC F-PLN, the FMS may spuriously modify the MDH value. The MDH value in the active flight plan's PERF APPR page may be spuriously modified by the altitude difference between the airport elevation and the landing runway elevation.

Example:
- MDH in SEC PERF APPR page: 500 ft
- Airport elevation: 520 ft; Runway elevation: 560 ft
- Airport elevation - Runway elevation equals -40 ft
- After SEC F-PLN activation, MDH in PERF APPR page is 460 ft.

Depending on the airport, this would cause early or late triggering of:
- The "Hundred above" or "Minimum" auto-callouts
- The automatic AP disconnection at MDH - 50 ft.

Note: *The altitude difference between the airport elevation and the landing runway elevation may be positive or negative depending on the airport/runway involved.*

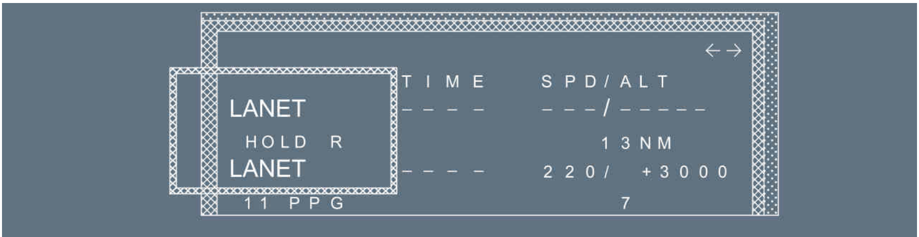
PROCEDURE

- **If there is a value in the MDH field of SEC PERF APPR page, then after activating the SEC F-PLN:**
  MDH value on PERF APPR page...CHECK/MODIFY AS RQRD

INCORRECT MANAGEMENT OF SPEED CONSTRAINT FOR ARRIVAL PROCEDURE HOLDS

Ident.: DSC-22_20-100-20-00013768.0001001 / 16 NOV 11
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

A procedure Holding Pattern (HOLD) is part of a navigation database procedure. The flight crew cannot manually insert it in the flight plan.
The aircraft flies the HOLD one time, and exits it automatically at the HOLD fix.



```
                                        ←→
          TIME        SPD/ALT
LANET     ----        ---/-----
  HOLD R                  13NM
LANET     ----        220/  +3000
  11 PPG                   7
```

Procedure HOLD on the F-PLN MCDU page

The FMS computes procedure HOLDs based on the predicted speed of the aircraft at the pattern entry. For an arrival procedure HOLD, the FMS-predicted speed takes into account:

- The ICAO-fixed speed limit for the hold,
- Any speed constraint coded at the hold entry fix.

Some operators reported the following misbehaviour: if charts indicate a speed constraint for a procedure HOLD, the FMS erroneously applies this speed constraint only at the exit fix, instead of the entry fix. As a consequence, the FMS-predicted HOLD speed does not take the speed constraint into account.
As a result, the FMS may compute the HOLD based on a speed that is higher than required. In such a case, the HOLD will have a size larger than expected.

<u>Note:</u> *If the flight crew reverts to selected speed to reduce the speed at the HOLD entry, the FMS will not re-compute the size of the HOLD.*

OPERATIONAL RECOMMENDATION

During descent preparation:

- Use the charts to CHECK if the arrival procedure includes a HOLD that has a speed constraint.
- If the arrival procedure includes a HOLD that has a speed constraint: ENTER MANUALLY the speed constraint at the hold entry fix.

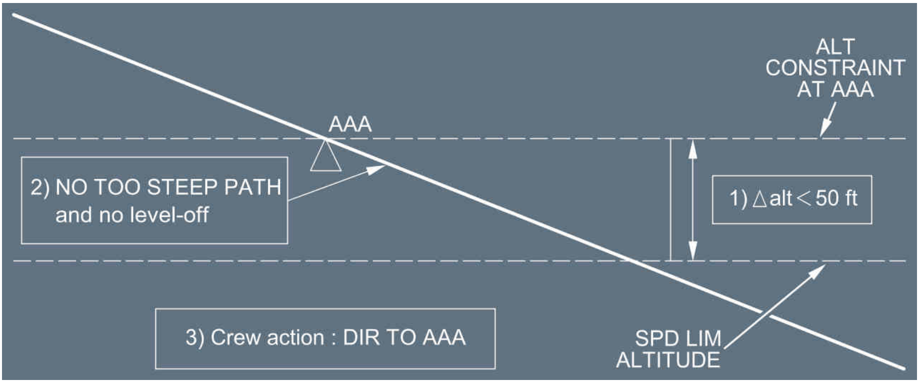
SEVERE RESET WHEN THE DESCENT SPEED LIMIT ALTITUDE IS CLOSE TO AN ALTITUDE CONSTRAINT

Ident.: DSC-22_20-100-20-00013769.0001001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Severe resets with loss of flight plan occur in the following conditions:

1. A waypoint with a descent altitude constraint is located at less than 50 ft from the descent speed limit altitude,
2. This altitude-constrained waypoint is not followed by a too steep path or a level-off,
3. The flight crew performs a DIR TO this altitude-constrained waypoint.

Note: *The altitude constraint on the waypoint may come from the Navigation database coding or from a flight crew's entry.*



As of today, these resets happen systematically in case of DIR TO on several STARs located in Ukraine. The reason is that in this area, procedures often contain by design an altitude constraint that is very close to the speed limit altitude.
Moreover, these resets may also happen anywhere, in cases where the flight crew has manually entered an altitude constraint that is very close to the speed limit altitude.

OPERATIONAL RECOMMENDATION

Do not perform a DIR TO a waypoint that has an altitude constraint located at less than 50 ft from the descent speed limit altitude.

Note: *The pseudo-waypoint "(LIM)" represents the descent speed limit on the F-PLN page.*

EOSID F-PLN LIMITED TO 10 LEGS

Ident.: DSC-22_20-100-20-00013770.0001001 / 17 MAR 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

When the EOSID contains more than 10 legs :
- The ND Display in PLAN mode only shows the first 10 legs of the EOSID
- In the case an engine out occurs before the diversion point, the TMPY flight plan ends at the end of the 10th leg.

To avoid that the EOSID ends after the 10th leg, the flight crew must insert the EOSID as a SID in the secondary flight plan (SEC F-PLN).

PROCEDURE

During Cockpit Preparation :

CREATE a SEC F-PLN (e.g. using COPY ACTIVE)
SELECT the EOSID as a SID in the SEC F-PLN.
REVIEW the display on the ND of the SID for Engine Out (white line) as SEC F-PLN

In the case of engine failure before the Engine Out Diversion Point :

ACTIVATE the SEC F-PLN (EOSID)

If the Navigation Database has not been changed, the automatic proposal of Temporary F-PLN for EOSID must be erased before activating the SEC F-PLN.

Note: To avoid that the flight crew needs to reject the automatic proposed TMPY F-PLN (EOSID limited to 10 legs) in case of engine failure, Airbus recommends that the EOSID is coded in the Navigation Database as a SID and not as an EOSID.

ERRONEOUS FUEL PREDICTIONS IN THE CASE OF DESCENT WITH TWO ALTITUDE CONSTRAINTS

Ident.: DSC-22_20-100-20-00013771.0001001 / 17 MAR 11
Applicable to: ALL

DESCRIPTION

If the flight plan has two altitude constraints for the descent, the flight crew may notice erroneous FMS fuel predictions.

EXPLANATION

If the flight plan has two altitude constraints for the descent, the FMS may define a geometric segment between both altitude constraints. If there is a deceleration required within the geometric segment, the FMS may consider that the geometric segment is too steep to fly without speedbrakes. In this case, the FMS tags the entire geometric segment as a speedbrake segment : The FMS assumes that during the entire segment half of the speedbrakes are extended, even for the parts where no deceleration is planned. As a consequence, the FMS will predict an increased thrust for the entire geometric segment. This may lead to erroneous fuel predictions. (a long geometric segment (e.g. above 100 NM) may lead to an error of 1.5 t for the fuel prediction at destination).

Note: When flying the geometric segment, the predictions become better as the aircraft approaches the end of the geometric segment, and turn back to normal when the aircraft has sequenced the second altitude constraint.

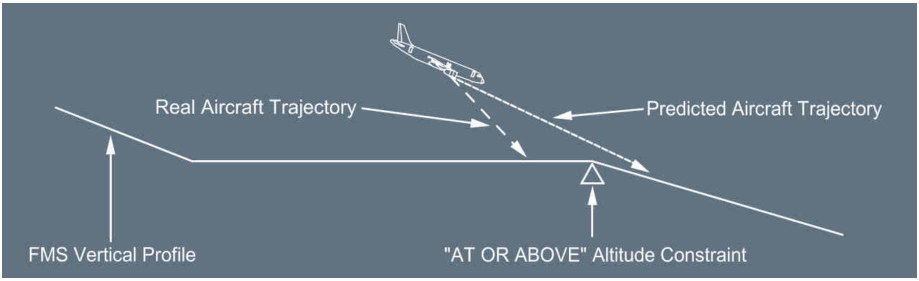
PROCEDURE

If the flight crew suspects this behavior in preflight, or during the flight, they can delete and enter again one altitude constraint in descent and compare the fuel predictions of the flight plan with and without the geometric segment. This allows the flight crew to evaluate the impact of the geometric segment on the fuel predictions.
It is not recommended to permanently delete altitude constraints that are stored in the navigation database.

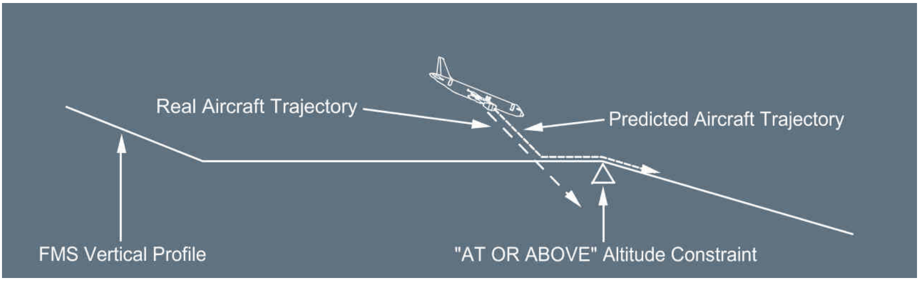
UNDUE REVERSION TO V/S DURING CLIMB AND DESCENT

Ident.: DSC-22_20-100-20-00014332.0002001 / 04 MAY 12
Applicable to: LV-GKO, LV-GKP

A reversion to the V/S mode may occur when the aircraft reaches an altitude constraint in the CLB or DES mode, while above the vertical profile.
When the FMS is not on the vertical profile, the FMS makes assumptions in order to compute the FMS predictions. For example, if the aircraft flies in selected speed, the FMS considers an immediate return to managed speed.
These assumptions can result in FMS predictions that are not consistent with the real trajectory of the aircraft. Therefore, the FMS may not anticipate the need to level off, when the FCU selected altitude is above the altitude constraint in climb or below the altitude constraint in descent.


Real Aircraft Trajectory
Predicted Aircraft Trajectory
FMS Vertical Profile
"AT OR ABOVE" Altitude Constraint

However, the FMS requests the ALT CST* mode, when the aircraft reaches the altitude constraint, in order to level off and comply with the altitude constraint.
Due to a problem of communication between the FMS and the FG, the FMGC may unduly revert to the V/S mode. The FWC triggers a triple-click aural warning 🔊 , and the aircraft goes beyond the altitude constraint.


Real Aircraft Trajectory
Predicted Aircraft Trajectory
FMS Vertical Profile
"AT OR ABOVE" Altitude Constraint

OPERATIONAL RECOMMENDATIONS

Understand your FMA at all times.

- **If the FMGC reverts to the V/S mode:**

  Adjust the vertical speed or level off in order to comply with the altitude constraint.

OPTIMUM TARGET SPEEDS NOT UPDATED FOLLOWING THE AUTOMATIC DELETION OF A STEP CLIMB

Ident.: DSC-22_20-100-20-00014652.0001001 / 04 NOV 20
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

DESCRIPTION

During the FMS climb phase, if the flight crew selects an altitude on the FCU that is above the CRZ FL displayed on the PROG page, the altitude selected on the FCU becomes the new CRZ FL.
If this new CRZ FL is at or above the altitude of a Step Climb of the flight plan, the FMS automatically deletes the Step Climb. The FMS displays the STEP DELETED message.
As the optimum target speeds (ECON CLIMB speed/Mach and ECON CRUISE speed/Mach) depend on the CRZ FL, the FMS should immediately update the ECON CLIMB speed/Mach and the ECON CRUISE speed/Mach.
Due to a FMS misbehavior, the FMS may not correctly manage the automatic deletion of the Step Climb when the CRZ FL is automatically set to the altitude selected on the FCU. The FMS may not update the ECON CLIMB speed/Mach and the ECON CRUISE speed/Mach accordingly.
If the ECON CRUISE speed/Mach was not correctly updated, the FMS updates the ECON CRUISE speed/Mach when the aircraft reaches the new CRZ FL. However, the FMS updates the ECON CRUISE speed/Mach with a rate of 0.01 Mach/min, in order to avoid sudden increase of the target speed. Therefore, the aircraft may take several minutes to reach the new ECON CRUISE speed/Mach.

OPERATIONAL RECOMMENDATIONS

- **If the flight crew suspects this misbehavior during the flight and the FMS is in CLIMB phase:**

  CHANGE the CI or the CRZ FL on the PROG page, the optimum target speed is updated when the aircraft reaches the CRZ FL.

- **If the flight crew suspects this misbehavior during the flight and the FMS is in CRUISE phase:**

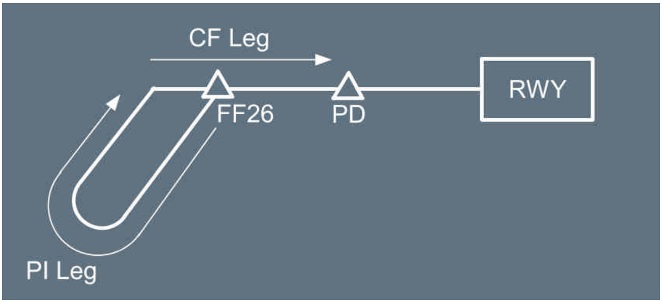
  The optimum target speed is updated with a rate of 0.01 Mach/min when the aircraft reaches the FCU altitude.

INCORRECT PROCEDURE TURN TRAJECTORY DURING NPA IN MANAGED MODE

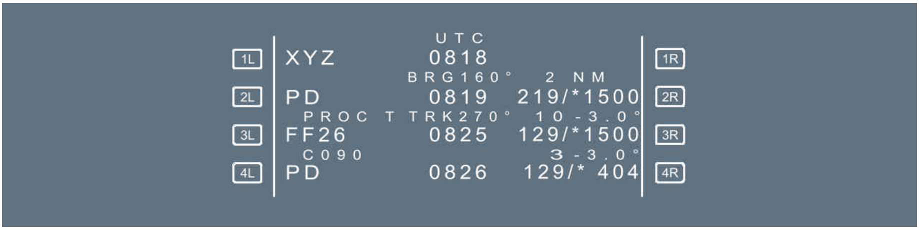
Ident.: DSC-22_20-100-20-00014846.0001001 / 29 MAY 13
Applicable to: LV-GKO, LV-GKP

The FMS does not correctly guide the aircraft in lateral managed mode on Non-Precision Approach procedures that contain a procedure turn (PI-CF leg).

A procedure turn (PI-CF leg) is coded in the Navigation Database with two leg types:
- A PI leg defines a course reversal starting at a specific database fix. It includes an outbound leg followed by a left or right turn and 180 degree course reversal to intercept the next leg
- A Course-to-Fix (CF) leg that defines a course to a waypoint.



On the MCDU F-PLN page, a procedure turn (PI-CF leg) is identified with "PROC T" as follows:



```
                UTC
XYZ             0818
              BRG160°    2 NM
PD              0819   219/*1500
   PROC T TRK270°       10 -3.0°
FF26            0825   129/*1500
   C090                  3 -3.0°
PD              0826    129/* 404
```

OPERATIONAL RECOMMENDATION

During Non-Precision Approach procedures that include a procedure turn (PI-CF leg coded in the Navigation Database), the flight crew must not use the NAV mode and the FINAL APP mode. The flight crew should fly the approach procedure in selected modes using NAVAID raw data.

ERRONEOUS LATERAL GUIDANCE IN NAV MODE WITH LOC MODE ARMED DURING APPROACH

Ident.: DSC-22_20-100-20-00014857.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

During approach, the FMS may guide the aircraft along a specific track instead of along the F-PLN with NAV mode green on the FMA, because of the LOC Convergence function (*Refer to DSC-22_30-40-80-10 LOC* Engagement Conditions - LOC Convergence Function*).
The logics of the LOC Convergence function is as follows:

- **If NAV mode is engaged, and LOC mode is armed,**
  and
  The aircraft is within 20 NM of the destination runway,
  and
  The difference between the aircraft track and the QFU is less than 20 °.

  The aircraft is guided with a track of 20 ° from the LOC axis.

  The NAV mode remains engaged. However the aircraft no longer follows the F-PLN, but converges towards the LOC axis.

- **If the difference between the aircraft track and the QFU becomes more than 20 ° when the LOC Convergence function is active:**

  The FMS deactivates the LOC Convergence function, and the aircraft follows back the F-PLN.

  It may lead to slight oscillations, since the FMS may successively activate and deactivate the LOC Convergence function.

OPERATIONAL RECOMMENDATIONS

- **If the flight crew considers that the LOC Convergence function may affect the guidance along the F-PLN trajectory in NAV mode:**

  On the intercept trajectory for the LOC axis, the flight crew should push the APPR pb (or the LOC pb-sw) when appropriate.

- **If the flight crew detects that the aircraft does not follow the intended trajectory:**

  The flight crew should revert to HDG/TRK mode, and intercept the LOC axis with the HDG/TRK mode engaged and the LOC mode armed.

ERRONEOUS TRAJECTORY DURING PROCEDURES WITH A TURN DIRECTION ON A LEG WITH AN ALTITUDE TERMINATION

Ident.: DSC-22_20-100-20-00015787.0001001 / 09 SEP 14
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

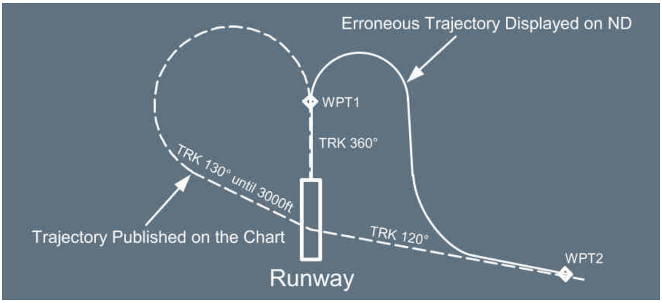
In some very specific operational conditions that depend on the coding in the Navigation Database of the procedure, and on various performance conditions (aircraft weight, flaps, thrust setting, temperature, wind...), the FMS may compute an erroneous trajectory on some Standard Instrument Departures (SID), and on some Missed Approach procedures.

The SIDs and the Missed Approach procedures that may be affected are coded in the Navigation Database with a leg that has a turn direction and an altitude termination. The leg can be one of the following:
- A Course-to-an-Altitude (CA) leg that defines a course to follow to an altitude
- A Fix-to-an-Altitude (FA) leg that defines a track to follow from a waypoint to an altitude
- A Heading-to-an-Altitude (VA) leg that defines a heading to follow to an altitude
- A Holding-to-an-Altitude (HA) leg that defines a holding pattern to an altitude

The turn direction (left or right) that is coded on a leg indicates that the aircraft has to execute a turn in the specified direction to intercept the leg.
In some very specific operational conditions (aircraft weight, wind...), the FMS may predict that the aircraft will reach the altitude that terminates the leg, before the initiation of the leg. In that case, the FMS ignores the leg, and the associated turn direction.
The FMS computes a new trajectory to directly join the next leg. The trajectory may not be consistent with the published trajectory.

Example:

- Leg 1: a Course-to-Fix (CF) leg that defines a track (360 °) to a waypoint (WPT1)
- Leg 2: a Course-to-an-Altitude (CA) leg that defines a track (130 °) to intercept an altitude (3 000 ft). The leg is coded in the Navigation Database with a turn direction (left). The end of the leg depends on the aircraft performance. The turn direction is indicated by an arrow on the line of leg 1 on the MCDU
- Leg 3: a CF leg that defines a track (120 °) to a waypoint (WPT2)


Erroneous Trajectory Displayed on ND
WPT1
TRK 360°
TRK 130° until 3000ft
Trajectory Published on the Chart
TRK 120°
WPT2
Runway

Depending on the aircraft performance, the FMS may predict that the aircraft will reach 3 000 ft before WPT1. In that case, the FMS ignores the leg 2 (CA leg) because the aircraft is already above the altitude that ends leg 2, before the beginning of leg 2. The FMS also ignores the turn direction that is coded on the leg.

As a result, the FMS computes again the trajectory from the end of leg 1, directly to leg 3. As shown on the above illustration, this trajectory includes a right turn, instead of a left turn, because it induces the shortest course change to intercept leg 3 (CF leg).

If the NAV mode is engaged, the aircraft follows this erroneous trajectory.

OPERATIONAL RECOMMENDATIONS

The flight crew should pay particular attention to the check of the flight plan during the Cockpit Preparation, and during the Descent Preparation.

CAUTION	Even if the flight plan is correct during the Cockpit Preparation or during the Descent Preparation, the FMS may compute and display an erroneous trajectory when the FMS updates its predictions after takeoff or after go-around initiation.

If the flight crew detects that the lateral flight plan does not agree with the published trajectory, the flight crew should revert to the HDG/TRK mode, and monitor NAVAID raw data as appropriate.

The flight crew should reengage the NAV mode when the lateral flight plan is consistent with the published trajectory.

ERRONEOUS TRAJECTORY WHILE IN HDG (TRK) MODE DURING PROCEDURES WITH A TURN DIRECTION ON A LEG WITH AN ALTITUDE TERMINATION

Ident.: DSC-22_20-100-20-00023970.0003001 / 26 NOV 19

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

DESCRIPTION

In some very specific operational conditions that depend on the coding in the Navigation Database of the procedure, and on various performance conditions (aircraft weight, flaps, thrust setting, temperature, wind ...), the FMS may compute an erroneous trajectory.

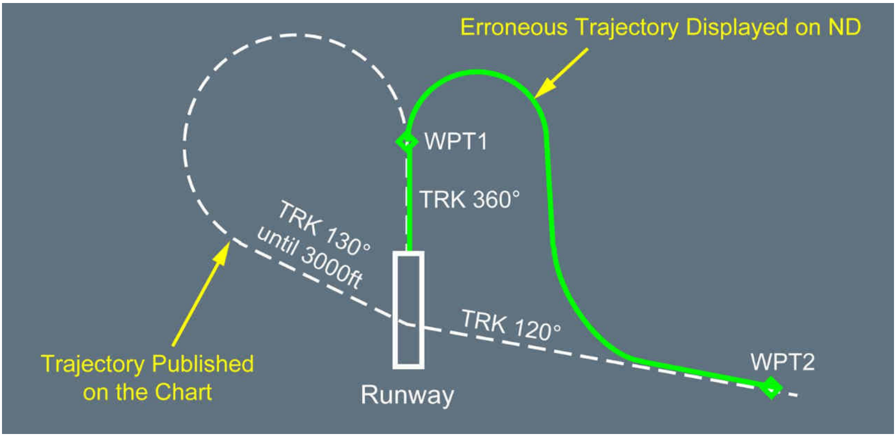
The SIDs and the Missed Approach procedures that may be affected are coded in the Navigation Database with a leg that has a turn direction and an altitude termination. The leg can be one of the following:
- A Course-to-an-Altitude (CA) leg that defines a course to follow to an altitude
- A Fix-to-an-Altitude (FA) leg that defines a track to follow from a waypoint to an altitude
- A Heading-to-an-Altitude (VA) leg that defines a heading to follow to an altitude
- A Holding-to-an-Altitude (HA) leg that defines a holding pattern to an altitude.

The turn direction (left or right) that is coded on a leg indicates that the aircraft has to execute a turn in the specified direction to intercept the leg.
In some very specific operational conditions, the FMS may predict that the aircraft will reach the altitude that terminates the leg, before the initiation of the leg. In that case, the FMS ignores the leg and the associated turn direction.
The FMS computes a new trajectory to directly join the next leg. The trajectory may not be consistent with the published trajectory.
The abnormal behavior depends on the AP/FD lateral modes engaged.

After takeoff, the NAV mode engages. At any time before the end of the altitude termination leg:
- If the NAV mode stays engaged, the FMS will compute a trajectory consistent with the published trajectory
- If the HDG/TRK mode is engaged, the FMS may compute an erroneous trajectory and display it on the ND. If the flight crew engages the NAV mode, the aircraft will follow the erroneous trajectory.

Example:
- Leg 1: A Course-to-Fix (CF) leg that defines a track (360 °) to a waypoint (WPT1)
- Leg 2: A Course-to-an-Altitude (CA) leg that defines a track (130 °) to intercept an altitude (3 000 ft). The leg is coded in the Navigation Database with a turn direction (left). The end of the leg depends on the aircraft performance. The turn direction is indicated by an arrow on the line of leg 1 on the F-PLN page of the MCDU.
- Leg 3: A CF leg that defines a track (120 °) to a waypoint (WPT2).

Erroneous trajectory on ND


Erroneous Trajectory Displayed on ND
WPT1
TRK 360°
TRK 130° until 3000ft
TRK 120°
WPT2
Trajectory Published on the Chart
Runway

Depending on the aircraft performance, the FMS may predict that the aircraft will reach 3 000 ft before WPT1. In that case, if the HDG/TRK mode is engaged, the FMS ignores the leg 2 (CA leg) because the aircraft is already above the altitude that ends leg 2, before the beginning of leg 2. The FMS also ignores the turn direction that is coded on the leg.
As a result, the FMS computes again the trajectory from the end of leg 1, directly to leg 3. As shown on the above illustration, this trajectory includes a right turn, instead of a left turn, because it induces the shortest course change to intercept leg 3 (CF leg). This erroneous trajectory will be displayed on the ND.
If flight crew reengages the NAV mode before the end of the altitude termination leg, the aircraft follows this erroneous trajectory.

OPERATIONAL RECOMMENDATIONS

The flight crew should pay particular attention to the check of the flight plan during the Cockpit Preparation, and during the Descent Preparation.

CAUTION	Even if the flight plan is correct during the Cockpit Preparation or during the Descent Preparation, the FMS may compute and display an erroneous trajectory when the FMS updates its predictions after takeoff or after go-around initiation.

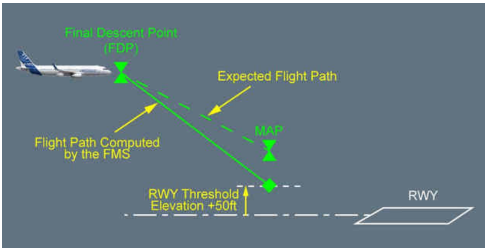
When in HDG/TRK mode after takeoff or go around initiation, if the flight crew detects that the lateral flight plan does not agree with the published trajectory, the flight crew should keep the HDG/TRK mode engaged, and monitor NAVAID raw data as appropriate.
The flight crew should only reengage the NAV mode when the lateral flight plan is consistent with the published trajectory.

ERRONEOUS VERTICAL PROFILE DURING LOC B/C APPROACHES WITH MAP LOCATED BEFORE THE RUNWAY THRESHOLD

Ident.: DSC-22_20-100-20-00019854.0004001 / 25 JUL 16
Applicable to: ALL

DESCRIPTION

When the flight crew selects a LOC Back Course (LOC B/C) approach in the arrival page of the MCDU, if the Missed Approach Point (MAP) is located before the runway threshold, the FMS builds the final approach vertical flight path assuming that there is an altitude constraint at the MAP, equal to the runway (RWY) threshold elevation plus 50 ft, disregarding the actual coded MAP altitude.
As a result, the FMS computes an erroneous vertical flight path for the final approach, an erroneous crossing altitude at the MAP, and displays an erroneous vertical deviation indication (V/DEV symbol on the PFD and V/DEV value on MCDU PROG page), when flying the approach.



Therefore, the flight crew must fly the LOC B/C approaches in selected vertical guidance mode (FPA or V/S mode), and they must disregard the V/DEV displayed on the PFD and MCDU PROG page.

PROCEDURE

For LOC B/C approaches, check the position of the MAP on the approach chart:

- **If the MAP is located at the runway threshold:**
  V/DEV symbol can be used to assist the flight crew in flying the vertical flight path in selected mode. Crosscheck the final descent with the published chart using altitude versus distance, as per Standard Operating Procedures (SOPs).

- **If the MAP is located before the runway threshold:**
  DISREGARD the V/DEV symbol, and crosscheck the final descent using the altitude versus the distance to the MAP.

ERRONEOUS VERTICAL GUIDANCE IN APPROACH SUBSEQUENT TO A DIR TO PERFORMED WHEN NEAR THE TOP OF DESCENT

Ident.: DSC-22_20-100-20-00023138.0001001 / 05 MAR 19
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

DESCRIPTION

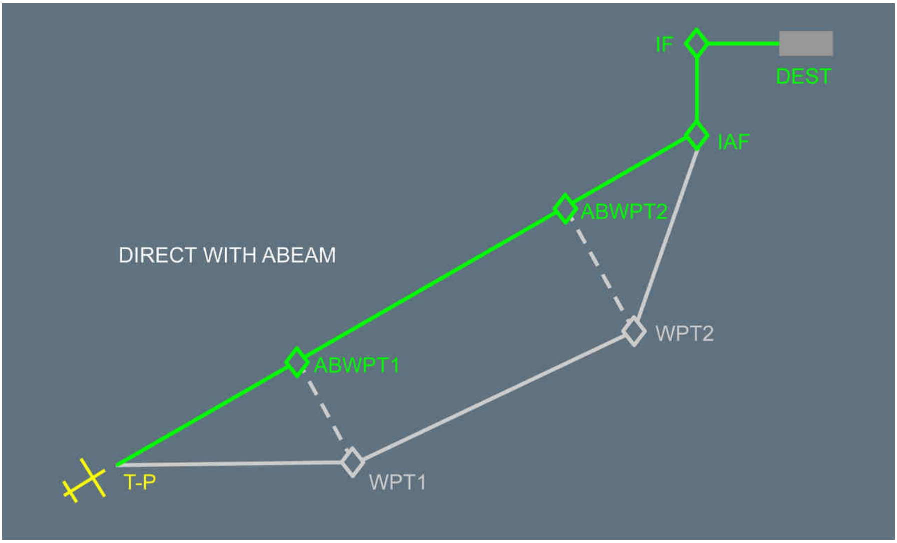
When the flight crew inserts a DIR TO waypoint, the FMS computes the horizontal path to the destination. When near the top of descent, if the flight crew inserts a DIR TO waypoint that is at, or after the IAF, the FMS computation may be erroneous for all of the following:

- The distance of the legs after the DIR TO waypoint.
- The vertical deviation on the legs after the DIR TO waypoint.
- The vertical guidance in DES and FINAL APP modes.

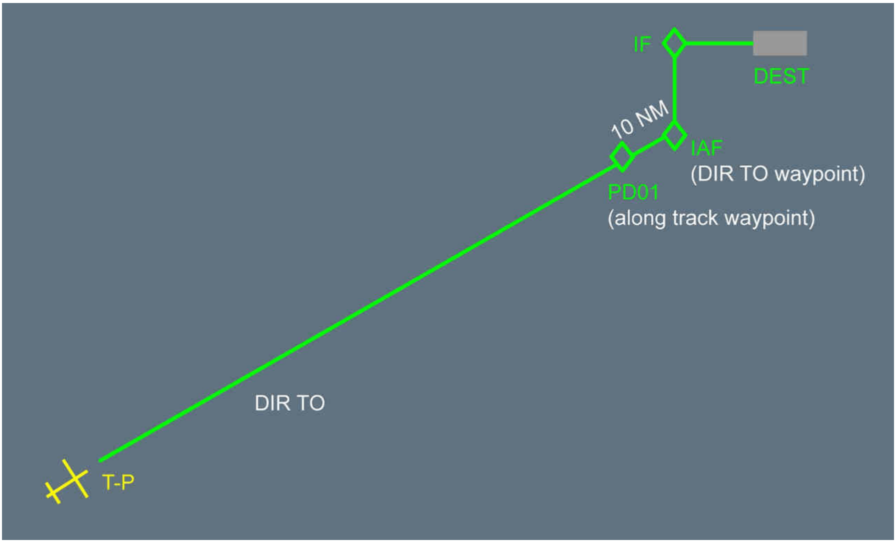
In order to compute the turn radius of the horizontal path, the FMS uses the current TAS at the time of the DIR TO insertion.This is the cause to the erroneous calculation. Instead, the FMS should use the TAS that is predicted at the DIR TO waypoint.

PROCEDURE

When near the top of descent, to insert a DIR TO waypoint that is at or after the IAF, the flight crew should use the DIRECT WITH ABEAM (ABEAM PTS) function. The flight crew must then check that at least one abeam waypoint is computed ahead of the position of the aircraft.
For more information on the DIRECT WITH ABEAM function, *Refer to DSC-22_20-30-10-15 DIR Key (Direct-TO-Function) - Procedure for DIR TO/Abeam*.


IF
DEST
IAF
ABWPT2
DIRECT WITH ABEAM
WPT2
ABWPT1
T-P
WPT1

If there is no abeam waypoint computed, the flight crew must insert a Place Distance waypoint 10 NM before the DIR TO waypoint (*Refer to DSC-22_20-30-10-15 Inserting a Waypoint - Along Track Waypoint Insertion*).



NO ENGAGEMENT OF THE PRESEL SPD TARGET IN CLIMB

Ident.: DSC-22_20-100-20-00023870.0002001 / 26 NOV 19
Applicable to: ALL

DESCRIPTION

This misbehavior is experienced if the flight crew entered a PRESEL SPD TARGET in the FMS PERF CLIMB page and when the following occurs simultaneously:
- FMS transition from TAKEOFF to CLIMB phase, and
- A F-PLN leg is sequenced by the FMS.

EXPLANATION

The FMS transition from TAKEOFF to CLIMB phase occurs in the following cases:
- The aircraft reaches the ACCEL ALT entered in the FMS PERF TAKEOFF page, or
- The SRS mode disengages and another vertical mode such as ALT* engages.

At the activation of the CLIMB phase, when a PRESEL SPD TARGET is set in the FMS PERF CLIMB page and A/THR is active, the FMS orders to synchronize the FCU SPD target to the preselected value and go to selected SPD mode automatically.
When a F-PLN leg is sequenced at the same time than the activation of the CLIMB phase, the FMS gives the priority to the leg sequencing process. Then, the PRESEL SPD TARGET is not taken into account. In such condition the PRESEL SPD TARGET entered in the FMS PERF

CLIMB page is disregarded and the aircraft accelerates to reach the MANAGED SPD TARGET displayed on the FMS PERF CLIMB page.

OPERATIONAL RECOMMENDATION

If the PRESEL SPD TARGET is not taken into account after the FMS transition from TAKEOFF to CLIMB phase, the flight crew should revert to selected speed mode and select the SPD TARGET on the FCU.

ERRONEOUS CF LEG COMPUTATION FOLLOWING FMS NEW RUNWAY WITH LS IDENT CREATION

Ident.: DSC-22_20-100-20-00023918.0005001 / 26 NOV 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DESCRIPTION

The flight crew may experience this abnormal behavior if a runway and its associated LS IDENT is created via the FMS NEW RUNWAY page.

If the flight crew creates a runway and its associated LS (LS IDENT of the FMS NEW RUNWAY page), the FMS considers this NAVAID as the recommended NAVAID for the newly created runway.
This created NAVAID does not have an associated magnetic variation in the FMS. Thus, the FMS may apply an erroneous magnetic variation and may compute an erroneous course for the CF leg.

OPERATIONAL RECOMMENDATION

In the case of runway creation, the flight crew should not insert an LS IDENT on the FMS NEW RUNWAY page.

If the flight crew plans to perform an ILS approach on the newly created runway, the ILS should be tuned via either of the following:
- The FMS RADIO NAV page, or
- The RMP.

ERRONEOUS MANAGED APPROACH SPEED AFTER DESCENT WIND UPLINK

Ident.: DSC-22_20-100-20-00024191.0002001 / 28 MAY 20
Applicable to: ALL

DESCRIPTION

This misbehaviour is encountered in the following conditions:
- The flight crew inserts the uplink of an AOC DESCENT WIND that contains wind at destination (GRND wind appears on the DESCENT WIND page)
- The flight crew does not manually reinsert the wind at destination on the PERF APPR page.

In the case of the uplink of an AOC DESCENT WIND that contains wind at destination (GRND wind appears on the DESCENT WIND page), all of the following apply:
- The FMS correctly receives and uses the wind at destination
- The wind at destination correctly appears on the PERF APPR page
- The FMS erroneously transmits the wind at destination to the Flight Guidance Computer for GSmini computation.

As a result, the managed approach speed that appears on PFD and which is used for guidance by the Flight Guidance Computer may be erroneously increased, depending on the current headwind that the flight crew encounters.

OPERATIONAL RECOMMENDATION

Starting from the DESCENT PREPARATION phase of the Standard Operating Procedures, the flight crew should manually reenter the wind at destination on the PERF APPR page, each time an uplink of an AOC DESCENT WIND that contains wind at destination (GRND wind appears on DESCENT WIND page) is performed. And this recommendation applies whatever the value of the wind at destination, which appears on the PERF APPR page, subsequent to the uplink. This applies even if the value to reenter on the PERF APPR page is exactly the same value.

UNEXPECTED ILS AUTO-TUNING

Ident.: DSC-22_20-100-20-00024494.0005001 / 09 MAY 23
Applicable to: LV-KHT, LV-KHU

DESCRIPTION

The FMS may erroneously automatically tune an ILS frequency in the following two cases:
- After selection of an ILS approach, the flight crew changes the approach and selects a RWY-only or Visual approach that is not associated with an ILS frequency, or
- The flight crew selects a RWY-only approach that is associated with an ILS frequency.

OPERATIONAL RECOMMENDATIONS

If the flight crew identifies an unexpected tuning of an ILS frequency by the FMS, the flight crew should insert the ILS frequency 108.00 in the FMS RADIO NAV page.

WARNING	Do not insert or clear ILS FREQ or CRS on both FMS sides simultaneously.

Note: 1. *108.00 is the default value of ILS frequency that is not associated with an ILS approach.*
2. *Inserting the CRS on one FMS side while the LS FREQ is cleared on the other FMS side results in dual FMS latch.*

LOSS OF FMS PREDICTIONS IN LOW DENSITY OF AIRPORTS

Ident.: DSC-22_20-100-20-00025961.0001001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DESCRIPTION

The FMS may encounter temporary and repetitive loss of predictions in the flight plan of the MCDU during flight, if the FMS finds only 4 airports in the Navigation Database within 1 200 NM from the aircraft position.
The occurrence rate increases when the flight crew enters a 5th airport on [5L] key of the CLOSEST AIRPORTS page.

Note: *During the occurrence, the UTC fields of the 4th and 5th (when entered) airports are dashed in the CLOSEST AIRPORTS page.*

The loss of the time prediction for more than 5 minutes can trigger a FWD fuel transfer from the TRIM tank.

OPERATIONAL RECOMMENDATION

The flight crew should clear the 5th airport in the CLOSEST AIRPORTS page to recover the full FMS predictions.
To avoid new occurrences in flight, the operator should request the FMS supplier to modify the Navigation Database to increase the number of available airports, on the flight routes affected by the loss of predictions. A minimum of 5 airports must be available within 1 200 NM of all expected flight plans.

TAB - INADVERTENT T.O. SPEEDS REVERSION UPON RWY CHANGE

1 Ident.: DSC-22_20-100-20-00026557.0001001 / 30 JAN 24
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DESCRIPTION

In the case of a runway change, the FMS may erroneously revert to the previous takeoff speeds when all the following occurs:

- Both MCDUs display the PERF TAKEOFF page,
- V1, VR and V2 associated with the previous runway are already entered,
- The new runway is entered in one MCDU,
- V1, VR and V2 associated with the new runway are entered by one flight crew member,
- The other flight crew member presses the 6R prompt (NEXT PHASE) of the PERF TAKEOFF page.

OPERATIONAL RECOMMENDATIONS

If the PERF TAKEOFF page is displayed on both MCDUs, when the new takeoff speeds are entered on one MCDU, the flight crew should not press the 6R prompt (NEXT PHASE) on the other MCDU.
The flight crew should apply the DEPARTURE CHANGE SOP and complete the DEPARTURE CHANGE checklist to ensure that correct speeds and thrust are set for the takeoff.

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT GUIDANCE

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DSC-22_30-10 General

General....................A

DSC-22_30-20 Flight Director

DSC-22_30-20-10 General

General....................A

DSC-22_30-20-20 FD Engagement

Manual Engagement....................A
Automatic Engagement....................B
Engagement Annunciation....................C

DSC-22_30-20-30 FD Symbology - Display

FD Symbology - Display....................A

DSC-22_30-20-40 FD Symbology - Non Display

FD Symbology - Non Display....................A

DSC-22_30-20-50 FD Disengagement

General....................A
Manual Disengagement....................B
Automatic Disengagement....................C
Disengagement Annunciation....................D

DSC-22_30-20-60 FD Warnings

FD Bars Flashing....................A
FD Flag....................B

DSC-22_30-30 Autopilot

DSC-22_30-30-10 General

General....................A

DSC-22_30-30-20 AP Engagement

Introduction....................A
Engagement Conditions....................B
Engagement Annunciation....................C

DSC-22_30-30-30 AP Disengagement

Manual Disengagement....................A
Automatic Disengagement....................B
Disengagement Annunciations and Warnings....................C

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DSC-22_30-40 AP/FD Modes

DSC-22_30-40-10 General

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AP/FD Lateral Modes....B
AP/FD Vertical Modes....C
AP/FD Common Modes....D
AP/FD Mode Status and Display....E

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General....A

DSC-22_30-40-20-20 SRS TO Mode

General....A
Engagement Conditions....B
Disengagement Conditions....C

DSC-22_30-40-20-30 RWY Mode

General....A
Engagement Conditions....B
Disengagement Conditions....C

DSC-22_30-40-20-40 RWY TRK Mode

General....A
Engagement Conditions....B
Disengagement Conditions....C

DSC-22_30-40-30 Lateral Guidance from Takeoff to Descent

DSC-22_30-40-30-10 HDG/TRACK Mode

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Engagement Conditions....B
HDG-V/S / TRK-FPA Selection....C
HDG/TRK Preset....D
Disengagement Conditions....E
Synchronize the HDG/TRK Window of the FCU....F

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General....A
Arming Conditions....B
Disarming Conditions....C
Engagement Conditions....D
Disengagement Conditions....E
Interactions with Vertical Modes....F

DSC-22_30-40-40 Climb

DSC-22_30-40-40-10 OP CLB Mode

General....A
Arming Conditions....B
Disarming Conditions....C
Engagement Conditions....D
OP CLB Association with Altitude Modes....E
Disengagement Conditions....F

DSC-22_30-40-40-20 CLB Mode

General....A
Arming Conditions....B
Disarming Conditions....C
Engagement Conditions....D
CLB Association with Altitude Modes....E
Disengagement Conditions....F

DSC-22_30-40-50 Altitude

DSC-22_30-40-50-10 ALT

General....A
ALT Arming Conditions....B
ALT Disarming Conditions....C
ALT* Engagement Conditions....D
ALT* Disengagement Conditions....E
ALT Engagement Conditions....F
ALT Disengagement Conditions....G

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DSC-22_30-40-50-20 ALT CST

General....A
ALT CST Arming Conditions....B
ALT CST Disarming Conditions....C
ALT CST* Engagement Conditions....D
ALT CST* Disengagement Conditions....E
ALT CST Engagement Conditions....F
ALT CST Disengagement Conditions....G

DSC-22_30-40-50-30 ALT CRZ

General....A
ALT CRZ Arming conditions....B
ALT CRZ Disarming Conditions....C
ALT CRZ* Engagement Conditions....D
ALT CRZ* Disengagement Conditions....E
ALT CRZ Engagement Conditions....F
ALT CRZ Disengagement Conditions....G

DSC-22_30-40-60 Descent

DSC-22_30-40-60-10 General

General....A

DSC-22_30-40-60-20 OP DES Mode

General....A
Engagement Conditions....B
Disengagement Conditions....C

DSC-22_30-40-60-30 DES Mode

General....A
Arming Conditions....B
Disarming Conditions....C
Engagement Conditions....D
Disengagement Conditions....E
Guidance in DES Mode....F
DES Mode Profile....G

DSC-22_30-40-70 V/S / FPA Mode

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ILS/GLS (If Installed)/SLS (If Installed) Guidance Mode....B
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DSC-22_30-40-80-10 LOC Mode

General....A
LOC Arming Conditions....B
LOC Disarming Conditions....C
LOC* Engagement Conditions....D
LOC* Disengagement Conditions....E
LOC Engagement Conditions....F
LOC Disengagement Conditions....G

DSC-22_30-40-80-20 G/S Mode

General....A
G/S Arming Conditions....B
G/S Disarming Conditions....C
G/S* Engagement Conditions....D
G/S* Disengagement Conditions....E
G/S Engagement Conditions....F
G/S Disengagement Conditions....G

DSC-22_30-40-80-30 LAND Mode

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Engagement Conditions....B
Disengagement Conditions....C

DSC-22_30-40-80-40 FLARE Mode

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Disengagement Conditions....C

DSC-22_30-40-80-50 ROLL OUT Mode

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LOC B/C* Engagement Conditions....D
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APP NAV and FINAL Disarming Conditions....C
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DSC-22_30-40-90 Go-Around

DSC-22_30-40-90-10 General

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DSC-22_30-40-90-20 SRS GA Mode

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ALT CST* .... N
AP1 .... O
AP1+2 .... P
AP2 .... Q
APP NAV (armed) .... R
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A/THR (activated) .... T
A/THR (armed) .... U
AUTO LAND (GLS ◁) V
BARO XXXXX .... W
BRK LO (armed) X
BRK LO (activated) .... Y
BRK MAX (activated) .... Z
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CAT1 .... AD
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CAT3 DUAL .... AF
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CHECK APPR SELECTION .... AH
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DECELERATE .... AL
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LOC (engaged)....................BE
LOC* ....BF
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LOC B/C (engaged)....................BH
LOC B/C* ....BI
LVR ASYM ....BJ
LVR CLB ....BK
LVR MCT ....BL
LVR TOGA ....BM
MACH ....BN
MACH SEL:.XX ....BO
MAN DTO ....BP
MAN FLX XX ....BQ
MAN MCT ....BR
MAN PITCH TRIM ONLY ....BS
MAN THR ....BT
MAN TOGA ....BU
MDA XXXXX ....BV
MDH XXXXX ....BW
NAV (armed)....................BX
NAV (engaged)....................BY
NO DH ....BZ
OP CLB (armed)....................CA
OP CLB (engaged)....................CB
OP DES CC
RADIO XXX ....CD
RETRACT SPD BRK ....CE
ROLL OUT ....CF
RWY ....CG
RWY TRK ....CH
SET GREEN DOT SPEED CI
SET HOLD SPEED ....CJ
SET MANAGED SPEED ....CK
SPEED CL
SPEED SEL:XXX ....CM
SRS ....CN
TCAS (armed) ....CO

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T/D REACHED .... CR
THR CLB .... CS
THR DCLB 1(2) .... CT
THR DES .... CU
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THR LK .... CW
THR LVR CX
THR MCT .... CY
TOGA LK .... CZ
TRACK .... DA
TRK FPA DESELECTED .... DB
USE MAN PITCH TRIM .... DC
V/S .... DD

DSC-22_30-110 Temporary Abnormal Behaviors

Misbehaviour of the enhanced LOC capture........ A

GENERAL

Ident.: DSC-22_30-10-00019224.0001001 / 18 MAY 22
Applicable to: ALL

The Flight Guidance (FG) provides the following functions:
- The Flight Director (FD)
- The Autopilot (AP)
- The Autothrust (A/THR).

The FG operates by using the following modes:
- AP/FD lateral modes to control the lateral trajectory
- AP/FD vertical modes to control the vertical trajectory, or the speed or Mach
- A/THR modes to control the speed or Mach, or the thrust.

Speed or Mach cannot be simultaneously controlled by the AP/FD and the A/THR.

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GENERAL

Ident.: DSC-22_30-20-10-00019225.0001001 / 18 MAY 22
Applicable to: ALL

The FD displays guidance orders on the PFD:
- If no AP is engaged, the flight crew can manually fly the aircraft by following FD orders, or
- If at least one AP is engaged, the flight crew can use the FD to monitor the FG.

There are two FDs referred to as FD1 and FD2. In normal operation:
- PFD1 displays FD1 guidance orders, computed by FMGEC1
- PFD2 displays FD2 guidance orders, computed by FMGEC2.

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MANUAL ENGAGEMENT

Ident.: DSC-22_30-20-20-00019234.0001001 / 04 MAY 23
Applicable to: ALL

The flight crew manually engages the onside FD by pressing the onside FD pb.

Note: *If the flight crew did not previously engage any AP or FD, then HDG or TRACK, and V/S or FPA engage. The FD symbol flashes for 10 s.*

AUTOMATIC ENGAGEMENT

Applicable to: ALL

Ident.: DSC-22_30-20-20-A-00019235.0001001 / 18 MAY 22

ON GROUND

FD1 and FD2 automatically engage at aircraft power-up.

IN FLIGHT

FD1 and FD2 automatically engage in flight, if:
- The flight crew engages the SRS GA mode, or
- The AP/FD TCAS mode engages upon a RA.

Ident.: DSC-22_30-20-20-A-00019856.0002001 / 18 MAY 22

Note: *On SRS engagement, if the flight crew previously selected the FPV/FPD display, the FD symbol reverts to vertical and horizontal bars.*

ENGAGEMENT ANNUNCIATION

Ident.: DSC-22_30-20-20-00019408.0001001 / 18 MAY 22
Applicable to: ALL

If FD1 and/or FD2 engages, all the following events occur:
- The associated FD pb on the FCU comes on
- The xFDy message appears in the "AP, FD, A/THR Engagement Status" column of both FMAs.

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FD SYMBOLOGY - DISPLAY

Ident.: DSC-22_30-20-30-00019229.0001001 / 18 MAY 22
Applicable to: ALL

The pitch, roll, and yaw bars respectively indicate the pitch, roll, and yaw FD guidance orders.

Note: *Independently from FD display, the FPV can be displayed on the PFDs. The FPV does not indicate guidance orders.*
For definition and display conditions of the FPV, Refer to DSC-31-40 Flight Path Vector

When the FDs are engaged, the PFDs can display the pitch, roll, and yaw symbologies.
Refer to DSC-31-40 Guidance

DISPLAY CONDITIONS OF THE GUIDANCE SYMBOLOGY, WHEN THE FDS ARE ENGAGED:

FOR LATERAL GUIDANCE

The PFD displays the roll bar when a lateral mode is engaged.

The PFD displays a yaw bar that replaces the roll bar in green below 30 ft radio height if a localizer signal is available during:
- Takeoff in RWY mode, or
- Landing in FLARE and ROLL OUT modes.

FOR VERTICAL GUIDANCE

The PFD displays the pitch bar after liftoff, when a vertical mode is engaged.

IN FLIGHT, IN TRK-FPA MODE

The FPD replaces both FD bars.
The FPD symbol shows the flight crew how to intercept and fly the vertical and lateral flight trajectory.
For more information about the FPD, *Refer to DSC-31-40 Guidance*

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FD SYMBOLOGY - NON DISPLAY

Ident.: DSC-22_30-20-40-00025304.0001001 / 18 MAY 22
Applicable to: ALL

If the FDs are not engaged, the PFDs do not display the FD symbology.

The FD bars disappear, when one of the following occurs:
- The aircraft bank angle exceeds 45 °, or
- The aircraft pitch exceeds 25 ° up or 13 ° down.

The pitch bar disappears in ROLL OUT.

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GENERAL

Ident.: DSC-22_30-20-50-00019651.0001001 / 18 MAY 22
Applicable to: ALL

If all FDs disengage while no AP is engaged, all the following occur:
- The lateral and vertical modes disengage, and
- If engaged, the A/THR reverts to (or remains in) SPEED or MACH mode.

If all FDs disengage while at least one AP is engaged, all the following occur:
- The lateral and vertical modes remain engaged, and
- If engaged, the A/THR remains engaged in the current mode.

MANUAL DISENGAGEMENT

Ident.: DSC-22_30-20-50-00019438.0001001 / 18 MAY 22
Applicable to: ALL

The flight crew can manually press the onside FD pb to disengage the onside FD.

AUTOMATIC DISENGAGEMENT

Applicable to: ALL

Ident.: DSC-22_30-20-50-A-00019437.0001001 / 18 MAY 22

The FD disengages if, in ROLL OUT, the difference between the aircraft track and the runway track is more than 20 °.

DUE TO FAILURES

The FD disengages if one of the following occurs:
- The FD becomes inoperative, or
- The FCU is not available, or
- All the engines fail.

DUE TO SPEED PROTECTION

The FD disengages if no AP is engaged and the aircraft speed is either:
- below VLS in DES or OP DES, or
- above VMAX in CLB or OP CLB.

Note: *After the FD disengages, the A/THR reverts to SPEED or MACH mode and adjusts the thrust to recover the target speed or keep the speed within the range from VLS to VMAX, if the target speed is out of this range.*

DISENGAGEMENT ANNUNCIATION

Ident.: DSC-22_30-20-50-00019441.0001001 / 18 MAY 22
Applicable to: ALL

If the flight crew disengages one FD, all the following occur:
- The corresponding FD pb goes off,
- The FD symbol no longer appears on the associated PFD,
- 1FD- appears on the FMA if FD2 is disengaged or -FD2 if FD1 is disengaged.

If one FD fails, all the following occur:
- All FD pb remain on,
- Both PFDs display the guidance orders from the remaining FD,
- 1FD1 appears on the FMA if FD2 fails, or 2FD2 if FD1 fails.

FD BARS FLASHING

Ident.: DSC-22_30-20-60-00019652.0001001 / 04 MAY 23
Applicable to: ALL

PITCH BAR

The pitch bar (or FPV) flashes for 10 s and remains steady, if one of the following occurs:
- An automatic reversion to V/S (or FPA) mode occurs, or
- All APs and FDs are previously disengaged and the flight crew engages the FD.

The pitch bar (or FPV) flashes, if, during approach, the MMR is not able to compute the vertical deviation above 100 ft RA.

ROLL BAR

The roll bar (or FPV) flashes for 10 s and remains steady, if one of the following occurs:
- An automatic reversion to HDG (or TRACK) mode occurs, or
- All APs and FDs are previously disengaged and the flight crew engages the FD.

The roll bar (or FPV) flashes if, during approach, the MMR is not able to compute the lateral deviation above 15 ft RA.

FD FLAG

Ident.: DSC-22_30-20-60-00019556.0001001 / 18 MAY 22
Applicable to: ALL

If the guidance orders are not available while the FD is engaged, a FD flag appears on the PFD and the FD bars disappear.

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GENERAL

Ident.: DSC-22_30-30-10-00019227.0001001 / 18 MAY 22
Applicable to: ALL

The AP:
- Stabilizes the aircraft around its center of gravity
- Controls the lateral trajectory
- Controls the vertical trajectory, or speed/Mach
- Coordinates with the A/THR
- Performs the automatic landing, or the go-around.

The AP generates:
- Pitch, roll, and yaw orders
- The nosewheel angle.

There are two APs: AP1 and AP2.
AP1 uses system data displayed on PFD1, and AP2 uses system data displayed on PFD2.

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INTRODUCTION

Ident.: DSC-22_30-30-20-00019251.0001001 / 04 MAY 23
Applicable to: ALL

When an AP engages, the sidesticks are locked in the neutral position, and the force to move the rudder pedals increases. However, the flight crew can always disengage the APs and the locking devices.
The APs engage with the same guidance mode previously used by the FD.
If the FDs were not previously engaged, the AP engages in HDG or TRACK, and V/S or FPA.
L2 The APs are available in normal and alternate law, only.

ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-30-20-A-00019252.0001001 / 18 MAY 22

ENGAGEMENT OF ONE AP

One AP engages when the flight crew presses the AP1 pb or the AP2 pb on the FCU, and the aircraft is in flight for more than 5 s.
In BACK-UP NAV, the AP engages in selected modes if the FG part is available.
The AP engages only if the aircraft pitch, bank angle, and speed are within an acceptable range.

Ident.: DSC-22_30-30-20-A-00019267.0001001 / 18 MAY 22

ENGAGEMENT OF BOTH APS

When one AP is engaged, the flight crew can press the second AP pb to engage the second AP.

However, the second AP can engage only when one of the following conditions is applicable:
- LOC is armed, or LOC* or LOC is engaged, and
- G/S is armed, or G/S* or G/S is engaged
- Go-around is engaged.

When both APs are engaged, AP1 is active, and AP2 is on standby, regardless of the order of AP engagement.

ENGAGEMENT ANNUNCIATION

Ident.: DSC-22_30-30-20-00022474.0001001 / 18 MAY 22
Applicable to: ALL

When AP1(2) engages, all the following events occur:

- The associated AP1(2) pb on the FCU comes on
- Both FMAs display:
  - AP1 (AP2)
  - AP1+2, if both APs are engaged.

MANUAL DISENGAGEMENT

Applicable to: ALL

Ident.: DSC-22_30-30-30-A-00019346.0001001 / 18 MAY 22

The APs disengages if one of the following occurs:

- The flight crew presses the takeover pb on the sidestick, or
- The flight crew presses the AP1(2) pb on the FCU, or
- The flight crew moves the pitch trim wheel beyond a certain threshold, or
- The flight crew moves a sidestick above a specific threshold, or

Ident.: DSC-22_30-30-30-A-00019347.0001001 / 18 MAY 22

- On ground, the flight crew moves the rudder pedals above a specific threshold, or

Ident.: DSC-22_30-30-30-A-00019348.0001001 / 18 MAY 22

- On ground, the flight crew sets all the thrust levers above the MCT detent.

Airbus recommends to press the sidestick pb two times to disengage both APs.
L2 One time to disengage the APs, the second time to clear the associated AP OFF alert.
L1 The other ways of disengagement are to be avoided. In particular, the disengagement of the APs with the sidestick, or the rudder pedal deflection is very uncomfortable for passengers.

AUTOMATIC DISENGAGEMENT

Ident.: DSC-22_30-30-30-B-00022475.0001001 / 18 MAY 22
Applicable to: ALL

The APs automatically disengage, if one of the following occurs:

- One of the engagement conditions is lost, or

Ident.: DSC-22_30-30-30-B-00024972.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

- During an approach with FINAL APP mode engaged, the aircraft reaches:
  - The MAP, or
  - The MDA/MDH -50 ft (if entered), or 400 ft AGL (if no MDA/MDH is entered).

Ident.: DSC-22_30-30-30-B-00024972.0002001 / 18 MAY 22
Applicable to: LV-KHT, LV-KHU

- During an approach with FINAL APP mode engaged, the aircraft reaches the MAP.

Ident.: DSC-22_30-30-30-B-00019354.0001001 / 18 MAY 22
Applicable to: ALL

In addition, in normal law with all protections available, the APs will disengage when:
- High speed protection activates, or
- Angle-of-attack protection activates, or
- Pitch attitude exceeds 25 ° up, or 13 ° down, or bank angle exceeds 45 °.

When the AP is OFF, the associated FCU pb goes off, and AP1 (AP2) disappears from the FMA.

DISENGAGEMENT ANNUNCIATIONS AND WARNINGS

Ident.: DSC-22_30-30-30-00019375.0001001 / 04 MAY 23
Applicable to: ALL

When AP1(2) disengages, all the following events occur:
- The associated AP1(2) pb on the FCU goes off
- On both FMAs, the AP 1 (AP 2) message disappears.

DISCONNECTION VIA THE takeover pb

The normal way to disconnect the AP is to press the takeover pb two times.

When the flight crew presses the takeover pb for the first time, the following warnings are triggered, and will continue, until the flight crew presses the takeover pb a second time:
- The AP OFF memo appears on the E/WD
- A cavalry charge audio indicator sounds
- The MASTER WARN light comes on.

When the flight crew presses the takeover pb the second time or the MASTER WARN light, all the above warnings are cleared.

If the flight crew does not quickly press the takeover pb a second time, the following additional warnings will trigger:
- The cavalry charge audio indicators sounds
- The AUTO FLT AP OFF alert is displayed on the E/WD.

When the flight crew presses the MASTER WARN light, or the takeover pb a second time, the cavalry charge audio indicator stops and the memos disappear, but the AUTO FLT AP OFF remains displayed.

OTHER WAYS OF DISCONNECTION

If the AP disengages, without any flight crew action on the takeover pb, the following warnings will trigger:
- A cavalry charge audio indicator sounds
- The AUTO FLT AP OFF alert is displayed on the E/WD.

When the flight crew presses the MASTER WARN light, or the takeover pb (one time), the cavalry charge stops and the memo disappears, but the alert remains displayed.

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INTRODUCTION

Ident.: DSC-22_30-40-10-00019380.0001001 / 18 MAY 22
Applicable to: ALL

The AP/FD modes are either lateral, vertical, or common.

Two types of AP/FD modes are available in order to guide the aircraft:
- Managed modes: when the aircraft is using managed targets, the FMGES guides the aircraft along lateral and vertical flight paths and speed profiles computed by the FM from data in the MCDU. FM manages the guidance targets.
- Selected modes: when the flight crew is using selected targets, the FMGES guides the aircraft along lateral and vertical flight paths and speed profiles to meet targets that the flight crew has selected manually on the FCU. The flight crew selects the guidance targets.

AP/FD LATERAL MODES

Applicable to: ALL

MODE	TYPE	GUIDANCE	REMARK

Ident.: DSC-22_30-40-10-A-00019383.0001001 / 04 MAY 23

RWY	MANAGED	Runway mode Mode used at takeoff to guide the aircraft along the runway center line using LOC.	Triggered by the thrust levers at FLX or TOGA position.
RWY TRK	MANAGED	Runway Track mode Mode used to guide the aircraft along the track the aircraft was following at the mode engagement.	
HDG, TRACK	SELECTED	Heading mode, Track mode Mode used to guide the aircraft on a heading or a track selected by the flight crew. The target value is displayed in the FCU window.	_Note:_ *HDG, TRACK are called "basic modes" because it is a back up mode for certain situations :* - *F-PLN discontinuity entry* - *AP engagement with no FD* - *Loss of F-PLN* - *MCDU BACK UP NAV.*

Ident.: DSC-22_30-40-10-A-00019389.0001001 / 06 NOV 23

NAV	MANAGED	Navigation mode Mode used to guide the aircraft along the lateral F-PLN. Available above 30 ft after takeoff.	Automatically armed at takeoff unless HDG,TRK is preset. In that case RWY TRK engages after takeoff.
LOC* **LOC**	MANAGED	Localizer capture mode Localizer track mode Mode used to guide the aircraft on the lateral approach path (LOC approach path).	Selected by pressing APPR pb or LOC pb on the FCU.
F-LOC* ◁ **F-LOC** ◁	MANAGED	Flight Management Landing System Localizer capture mode Flight Management Landing System Localizer track mode Mode used to guide the aircraft on the lateral approach path (F-PLN approach path).	Selected by pressing APPR pb or LOC pb on the FCU.

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MODE	TYPE	GUIDANCE	REMARK
LOC B/C * **LOC B/C**	MANAGED	Localizer Back Course capture mode Localizer Back Course track mode Mode used to guide the aircraft on the back beam of a localizer.	Selected by LAT REV at destination. Activated by pressing the LOC pb on the FCU.
GA TRK	MANAGED	Go-Around track mode Mode used to guide the aircraft along the track the aircraft was following at the mode engagement.	Triggered by the thrust levers at TOGA with Slats/Flaps in at least CONF 1.

Ident.: DSC-22_30-40-10-A-00019388.0001001 / 18 MAY 22

APP NAV	MANAGED	Approach Nav mode Mode used to guide the aircraft on the lateral approach path.	Selected by pressing APPR pb on the FCU; the mode that engages depends upon the selected approach in the F-PLN.

AP/FD VERTICAL MODES

Applicable to: ALL

Ident.: DSC-22_30-40-10-B-00019359.0001001 / 04 MAY 23

MODE	TYPE	GUIDANCE	REMARK
SRS	MANAGED	Speed Reference System mode Mode used at takeoff, or go-around to maintain SRS speed (V2, V2+10, VAPP...).	Triggered by the thrust levers at FLX or TOGA position. Automatically disengages at ACCEL ALT, or when another VERT mode is engaged.
OP CLB	SELECTED	Open Climb mode Mode used to climb directly to the FCU selected altitude. These modes disregard all ALT CST. The A/THR is in THRUST mode (CLB).	The speed target may either be selected or managed. ALT mode is systematically armed. Altitude target is blue on the PFD.
CLB	MANAGED	Climb mode Mode used to climb towards FCU selected altitude along VERT F-PLN taking into account ALT CST. Available, only if NAV mode engaged. The A/THR is in THRUST mode (CLB).	The speed target may either be selected or managed. If managed, SPD CST, SPD LIM, and HOLD SPD are taken into account. ALT mode is always armed, and the FMA displays: - ALT CST if the next level off is predicted at an ALT CST, or - ALT if the next level off is predicted at the FCU selected altitude.
ALT* **ALT**	SELECTED	Altitude acquire mode Altitude hold mode Mode used to maintain a level flight at the FCU selected altitude.	
ALT CST* **ALT CST**	MANAGED	Altitude Constraint capture mode Altitude Constraint hold mode Mode automatically engaged when reaching an ALT CST before the FCU selected altitude.	CLB/DES mode are systematically armed.
ALT CRZ* **ALT CRZ**	SELECTED	Altitude capture of the cruise flight level Altitude hold of the cruise flight level Mode used to maintain the cruise level flight.	A/THR SOFT mode engages when FCU selected altitude = CRZ FL. A/THR SOFT mode is part of the managed guidance.

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MODE	TYPE	GUIDANCE	REMARK
OP DES	SELECTED	Open Descent mode Mode used to descend directly to the FCU selected altitude. These modes disregard all ALT CST. The A/THR is in THRUST mode (IDLE).	The speed target may either be selected or managed. ALT mode is systematically armed. Altitude target is blue on the PFD.
DES	MANAGED	Descent mode Mode used to descend towards FCU selected altitude along the computed descent path, taking into account ALT CST. Available, only if NAV mode engaged. The A/THR may be in THRUST, or SPD mode.	The speed target may either be selected or managed. If managed, SPD CST, SPD LIM, and HOLD SPD are taken into account. ALT mode is always armed, and the FMA displays: - ALT CST if the next level off is predicted at an ALT CST, or - ALT if the next level off is predicted at the FCU selected altitude.
V/S, FPA	SELECTED	Vertical Speed mode, Flight Path Angle mode Mode used to guide the aircraft by a vertical speed, or a selected flight path angle.	Altitude target is blue on PFD. V/S-FPA is a basic mode.
G/S* **G/S**	MANAGED	Glide Slope capture mode Glide Slope track mode Mode used to guide the aircraft along the final approach path (ILS/GLS ◁ /SLS ◁ (RNAV(GNSS) approach with LPV minima guidance mode).	Selected by pressing APPR pb on the FCU.
F-G/S* ◁ **F-G/S** ◁	MANAGED	Flight Landing System Glide Slope capture mode Flight Landing System Glide Slope track mode Mode used to guide the aircraft along the final approach path (FLS ◁ approach).	Selected by pressing APPR pb on the FCU.

Ident.: DSC-22_30-40-10-B-00019360.0001001 / 18 MAY 22

FINAL	MANAGED	Final mode Mode used to guide the aircraft along the final approach path (non precision approach)	Selected by pressing the FCU's APPR pb. The mode engaged depends upon the selected approach in the F-PLN. Linked to APPR common mode (APPR pb).

Continued on the following page

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Ident.: DSC-22_30-40-10-B-00019361.0001001 / 18 MAY 22

MODE	TYPE	GUIDANCE	REMARK
AP/FD TCAS ◁✱	MANAGED	Mode used to guide the A/C in the case of TCAS RA	Automatically engaged when a RA is triggered.

AP/FD COMMON MODES

Applicable to: ALL

Ident.: DSC-22_30-40-10-C-00019387.0001001 / 18 MAY 22

MODE	TYPE	GUIDANCE	REMARK
LAND	MANAGED	Land mode Common mode engaged below 400 ft RA during an automatic ILS/GLS /SLS (RNAV(GNSS) approach with LPV minima guidance mode) approach.	Engaged only if LOC mode and G/S mode are already engaged.
FLARE	MANAGED	Flare mode Common mode which provides alignment to the runway centerline on the yaw axis, and flare on the pitch axis.	Engaged below 60 ft RA, based on the current vertical speed.
ROLL OUT	MANAGED	Roll Out mode Mode used to guide the aircraft on the runway following an automatic landing.	FD roll out symbol is displayed on PFD at touch down.

Ident.: DSC-22_30-40-10-C-00020292.0001001 / 18 MAY 22

MODE	TYPE	GUIDANCE	REMARK
FINAL APP	MANAGED	Final Approach mode Common mode including APP NAV and FINAL modes during non-precision approach.	Engaged only if APP- NAV mode and FINAL mode are already armed.

AP/FD MODE STATUS AND DISPLAY

Ident.: DSC-22_30-40-10-00019381.0001001 / 18 MAY 22
Applicable to: ALL

AP/FD MODE STATUS

An AP/FD lateral or vertical mode can be armed, engaged, or disengaged.
An AP/FD common mode can either be engaged or disengaged.
When all APs and FDs disengage, all AP/FD modes disengage.

AP/FD MODE DISPLAY

The FMA displays the AP/FD modes (*Refer to DSC-22_30-80-20 FMA Display*).

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General

GENERAL

Ident.: DSC-22_30-40-20-10-00022086.0001001 / 18 MAY 22
Applicable to: ALL

At takeoff, SRS vertical mode, and RWY lateral mode simultaneously engage. They disengage at different moment.
In some cases, when airborne, RWY mode can change to another lateral takeoff mode such as RWY TRK mode.

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SRS TO Mode

GENERAL

Ident.: DSC-22_30-40-20-20-00022087.0001001 / 18 MAY 22
Applicable to: ALL

The SRS mode is a managed vertical mode, used during takeoff and during go-around.
This chapter only describes the SRS mode during takeoff, also referred to as the SRS TO mode. The FMA announces the SRS TO mode with the SRS indication.
The SRS TO controls the speed via the elevators, in order to steer the aircraft along a vertical path.

L2 The guidance law also includes:
- A flight path angle protection, that ensures a positive climb slope of 0.5 °
- A pitch angle protection to reduce the aircraft nose-up (17.5 ° of maximum pitch attitude or 22.5 ° maximum in case of windshear)
- A speed protection limiting the target speed to V2+15 kt.

L1 When the aircraft is on ground, V2 is the speed target.
When the aircraft is airborne, V2+10 kt becomes the speed target.
If one engine fails, the speed target is the current aircraft speed at the engine failure detection.
However, the speed target is limited by V2 and V2+15 kt.
For more information on the speed target, *Refer to DSC-22_20-60-40 Flight Guidance Part*.
For more information on the speed target, *Refer to DSC-22_30-60-20 General*.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-20-00022088.0001001 / 18 MAY 22
Applicable to: ALL

SRS TO engages, when all of the following conditions are applicable:
- The aircraft is on ground
- The slats or the flaps are extended
- V2 is inserted in the PERF TAKEOFF page

L2 If V2 has not been inserted, V/S mode engages 5 s after lift-off on the current V/S value.

L1
- The flight crew sets at least one thrust lever:
  - To the TOGA detent, or
  - To the FLX-MCT detent, when a FLX TO temperature or a Derated Takeoff is entered in the PERF TAKEOFF page.

Note: *When V2 is inserted, or SRS TO is engaged, the speed automatically becomes managed. For more information about engagement conditions of managed speed, Refer to DSC-22_30-60-20 Engagement Conditions.*

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-20-20-A-00022089.0001001 / 04 MAY 23

SRS TO mode disengages, when one of the following occurs:
- Automatically, at the ACCEL ALT, or if ALT* or ALT CST* mode engages (above 400 ft RA), or
- Another vertical mode engages.

Note: *In Engine Out conditions, the SRS mode does not automatically disengage at EO ACCEL ALT.*

Ident.: DSC-22_30-40-20-20-A-00022090.0001001 / 18 MAY 22

REVERSIONS

SRS TO reverts to OP CLB, when the FCU selected altitude is above the aircraft altitude, and the flight crew pulls the SPD/MACH knob.

Ident.: DSC-22_30-40-20-20-A-00024948.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

RWY Mode

GENERAL

Ident.: DSC-22_30-40-20-30-00022102.0001001 / 18 MAY 22
Applicable to: ALL

The RWY mode is a managed lateral mode.
When the LOC signal is available, the RWY mode gives lateral guidance orders during takeoff, and initial climb.

L2 The RWY guidance law aims to maintain the aircraft on the runway centerline during the takeoff run.
When the aircraft is airborne, the RWY guidance law aims to maintain the sideslip indicator centered.
To follow the guidance, the FD displays the conventional guidance bar.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-30-00022116.0001001 / 18 MAY 22
Applicable to: ALL

RWY engages, if all of the following conditions are applicable:

L2
- V2 is inserted in the PERF TAKEOFF page, and
- The aircraft is on ground, and
- The slats are extended, and
- The LOC is valid, and
- The LOC deviation is below 1/2 dot, and
- The aircraft heading is within 20 ° of the ILS (GLS ◁) (SLS ◁) course, and
- An ILS (GLS ◁)(SLS ◁) is set, associated to the takeoff runway, and the difference between the LS course and the runway heading, as inserted in the flight plan is less than 2 °, and
- No lateral mode is already engaged, and

L1
- The flight crew sets a thrust lever to:
  - The TOGA detent, if TOGA is selected on the PERF TAKEOFF page, or
  - The FLX-MCT detent, if a FLX TO temperature or a Derated Takeoff ◁ level is entered on the PERF TAKEOFF page.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-30-00022126.0001001 / 04 MAY 23
Applicable to: ALL

RWY disengages, when one of the following occurs:
- The LOC is lost below 30 ft RA
- NAV is armed, and the aircraft reaches 30 ft RA: NAV engages

L2
- NAV is not armed, and the aircraft reaches 30 ft RA: RWY TRK engages

L1 - Another lateral mode engages

L2 - The aircraft heading deviates from more than 20 ° from the ILS (GLS ⊲)(SLS ⊲) course.

RWY TRK Mode

GENERAL

Ident.: DSC-22_30-40-20-40-00022129.0001001 / 18 MAY 22
Applicable to: ALL

RWY TRK mode is a managed lateral mode.
The RWY TRK mode guides the aircraft along a constant track target. The track target is the aircraft track at RWY TRK engagement.

L2 To follow the guidance, the FD displays the conventional guidance bar.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-40-00022130.0001001 / 18 MAY 22
Applicable to: ALL

The RWY TRK automatically engages at 30 ft RA, if all of the following conditions are applicable:
- The FMS flight phase is takeoff, and
- NAV is not engaged.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-20-40-00022131.0001001 / 04 MAY 23
Applicable to: ALL

RWY TRK disengages, when one of the following occurs:
- The flight crew pulls the HDG/TRK knob: HDG/TRACK engages.
- NAV is armed, and the aircraft reaches the capture zone of the active leg: NAV engages.
- The flight crew inserts a DIRECT TO waypoint: NAV engages.

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HDG/TRACK Mode

GENERAL

Ident.: DSC-22_30-40-30-10-00019558.0001001 / 18 MAY 22
Applicable to: ALL

HDG and TRK are selected lateral modes. They are the basic modes of lateral guidance. HDG/TRK guides the aircraft laterally along the heading/track target, that appears in the HDG/TRK window on the FCU. For more information on the HDG/TRK window, *Refer to DSC-22_10-40-20 Lateral Control Area* Window.

ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-30-10-A-00019559.0001001 / 04 MAY 23

HDG or TRACK engages when one of the following conditions occurs:

Ident.: DSC-22_30-40-30-10-A-00019778.0001001 / 18 MAY 22

- The flight crew pulls the HDG/TRK knob on the FCU in flight, or

L2 This is applicable if:
  - The aircraft is in flight, for at least 5 s after liftoff, or
  - Not in LAND, FLARE, or ROLL OUT, or
  - Not in GA TRK below 100 ft RA.

Ident.: DSC-22_30-40-30-10-A-00019779.0001001 / 18 MAY 22

- NAV is engaged and the flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT, or

Ident.: DSC-22_30-40-30-10-A-00019785.0001001 / 04 MAY 23

- FINAL mode (armed or engaged) is lost when the aircraft is in APP NAV mode, or

Ident.: DSC-22_30-40-30-10-A-00019786.0001001 / 04 MAY 23

- All AP and FDs were previously off, and the flight crew engages the AP or the FDs

  Note: *1. The AP or FDs engage in basic modes: HDG or TRACK, and V/S or FPA.*
  2. If the FD engages, the FD bars flash for 10 s.

Ident.: DSC-22_30-40-30-10-A-00019787.0001001 / 18 MAY 22

- LOC mode is armed when FINAL APP was previously engaged, or

Ident.: DSC-22_30-40-30-10-A-00019790.0001001 / 04 MAY 23

- The flight crew presses the APPR pb (above 400 ft RA) or the LOC pb to off, when the approach is armed, or

Ident.: DSC-22_30-40-30-10-A-00019792.0001001 / 18 MAY 22

- LOC*, LOC, LOC B/C*, LOC B/C, F-LOC* ◁ or F-LOC ◁ is engaged in a LOC only approach, and the flight crew presses the LOC pb to off.

Ident.: DSC-22_30-40-30-10-A-00020294.0001001 / 04 MAY 23

REVERSIONS TO HDG/TRK

The HDG/TRACK also engages when one of the following reversion occurs:

- NAV disengages:
  - The aircraft reaches a flight plan discontinuity
  - The NAV mode fails.
- The approach is modified in the flight plan, when LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, or LOC B/C is engaged
- LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, or LOC B/C is lost after a failure occurs in approach.
  All AP(s) disengage. The FDs reverts to HDG or TRACK and V/S or FPA.

Note: *If a managed vertical mode was previously engaged, a selected vertical mode engages:*
- *If CLB was engaged, OP CLB engages*
- *If ALT CST*, ALT CRZ*, or DES was engaged, V/S / FPA engages*
- *If ALT CST was engaged, ALT engages.*

Ident.: DSC-22_30-40-30-10-A-00022000.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

HDG-V/S / TRK-FPA SELECTION

Ident.: DSC-22_30-40-30-10-00022905.0001001 / 04 MAY 23
Applicable to: ALL

The flight crew can press the HDG-V/S / TRK-FPA pb on the FCU to change from one selection to another.
At the aircraft power-up, the HDG-V/S / TRK-FPA selection is set to HDG-V/S by default.

When HDG-V/S is selected:
- HDG appears on the HDG/TRK window of the FCU
- V/S appears on the V/S / FPA window of the FCU
- HDG and/or V/S mode(s) can be engaged
- TRACK and FPA modes cannot be engaged

When TRK-FPA is selected:
- TRK appears on the HDG/TRK window of the FCU
- FPA appears on the V/S / FPA window of the FCU
- HDG and V/S mode(s) cannot be engaged
- TRACK and/or FPA modes can be engaged
- Both PFDs display the FPV in green.

HDG/TRK PRESET

Ident.: DSC-22_30-40-30-10-B-00024993.0001001 / 04 MAY 23
Applicable to: ALL

GENERAL

The system has a HDG/TRK preset function for takeoff and go-around.
If the flight crew decides not to fly the flight plan after takeoff or go-around, the flight crew can turn the HDG/TRK knob on the FCU to preset a heading or a track. The set value remains displayed in the FCU HDG/TRK window until the flight crew pulls the knob.

AT TAKEOFF

If the flight crew presets the HDG/TRK before takeoff and up to 30 ft RA, NAV disarms. The preset value remains displayed in the HDG/TRK window (even when RWY TRK engages at 30 ft RA)
When the flight crew pulls the HDG/TRK knob (at least 5 s after liftoff), HDG or TRACK mode engages.
The aircraft follows the preset target.

Ident.: DSC-22_30-40-30-10-B-00019562.0002001 / 04 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AT GO-AROUND

If the flight crew presets the HDG/TRK when LOC*, LOC, LOC B/C, LOC B/C*, F-LOC* ◁ , F-LOC ◁ , LAND, FLARE, ROLL OUT or GA TRK mode is engaged, the preset value remains displayed in the HDG/TRK window, as long as one of theses modes is engaged.
After go-around engagement, HDG/TRACK will engage, when the flight crew pulls the HDG/TRK knob.
When the HDG or TRACK engages, the heading/track target is the HDG/TRK preset.

Ident.: DSC-22_30-40-30-10-B-00019562.0001001 / 04 MAY 23
Applicable to: LV-GKO, LV-GKP

AT GO-AROUND

If the flight crew presets the HDG/TRK when LOC*, LOC, LOC B/C, LOC B/C*, F-LOC* ◁ , F-LOC ◁ , LAND, FINAL APP, FLARE, ROLL OUT or GA TRK mode is engaged, the preset value remains displayed in the HDG/TRK window, as long as one of theses modes is engaged.
After go-around engagement, HDG/TRACK will engage, when the flight crew pulls the HDG/TRK knob.
When the HDG or TRACK engages, the heading/track target is the HDG/TRK preset.

Ident.: DSC-22_30-40-30-10-B-00025795.0001001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

When overflying the MAP, HDG/TRK will synchronize with the current aircraft heading / track. The HDG/TRK preset function is no longer available.

Ident.: DSC-22_30-40-30-10-B-00024994.0001001 / 18 MAY 22
Applicable to: ALL

CANCELLATION

The flight crew can cancel a HDG/TRK preset with one of the following action:
- The HDG/TRK knob is pushed, or
- A DIR TO is selected in the FMS, or
- The AP and FDs are disengaged.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-10-00019382.0001001 / 04 MAY 23
Applicable to: ALL

The engagement of any other lateral mode disengages HDG or TRACK.

SYNCHRONIZE THE HDG/TRK WINDOW OF THE FCU

Ident.: DSC-22_30-40-30-10-00019396.0001001 / 04 MAY 23
Applicable to: ALL

The lateral window of the FCU displays heading or a track value when:
- The HDG/TRACK mode is engaged. The displayed value is the current HDG/TRK or the manually selected value of the target
- The flight crew turns the HDG/TRK knob. The value in the window first synchronizes with the current HDG/TRK, then displays the manual selection. It remains displayed for 45 s, then vanishes if the flight crew does not pull the knob (except in HDG preset)

- A HDG/TRK is preset
- AP/FD is lost. The value becomes that of the aircraft current heading or track.

Note: *If HDG is switched to TRK (or vice versa), the value displayed in the window switches from heading to track (or vice versa).*

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NAV Mode

GENERAL

Ident.: DSC-22_30-40-30-20-00019634.0001001 / 18 MAY 22
Applicable to: ALL

The NAV mode is a managed lateral mode, that guides the aircraft laterally along the FMS flight plan. It is designed to have a zero crosstrack error. NAV usually arms before engaging.

ARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00019643.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

For NAV arming, the lateral flight plan must be available.

NAV arms, when one of the following occurs:
- The aircraft is on ground, and the flight crew does not preset a HDG/TRK for takeoff, or
- The flight crew pushes the HDG/TRK knob on the FCU, or
- The flight crew activates a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT when in HDG or TRK mode, or
- The flight crew presses the APPR pb and the conditions to arm the FINAL APP mode are applicable.

However, NAV cannot arm, if one of the following modes is engaged: LOC*, LOC, F-LOC* , F-LOC , LOC B/C*, LOC B/C, LAND, FLARE, ROLL OUT.

ARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00019643.0004001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

For NAV arming, the lateral flight plan must be available.

NAV arms, when one of the following occurs:
- The aircraft is on ground, and the flight crew does not preset a HDG/TRK for takeoff, or
- The flight crew pushes the HDG/TRK knob on the FCU, or
- The flight crew activates a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT when in HDG/TRK mode, or
- The flight crew presses the APPR pb and the conditions to arm the FINAL APP mode are applicable, or
- The flight crew initiates a go-around.

L2 This is not applicable if HDG/ TRK is preset.

L1 However, NAV cannot arm, if one of the following modes is engaged: LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C, LAND, FLARE, ROLL OUT.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00019645.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

NAV mode disarms, when one of the following occurs:
- The flight crew presets a HDG/TRK for takeoff, or go-around, or
- NAV mode engages, or
- The flight crew pulls out the HDG/TRK knob, or
- The flight crew arms or engages an approach mode, except if the APP NAV can be armed, or
- The flight crew engages a go-around, or
- LAND mode engages.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-30-20-00019645.0003001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

NAV mode disarms, when one of the following occurs:
- The flight crew presets a HDG/TRK for takeoff, or go-around, or
- NAV mode engages, or
- The flight crew pulls out the HDG/TRK knob, or
- The flight crew arms or engages an approach mode, except if the APP NAV can be armed, or
- LAND mode engages.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-20-00019646.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

For NAV engagement, the lateral flight plan must be available.

NAV engages, if one of the following occurs:
- NAV is armed, and the aircraft reaches 30 ft RA after takeoff, or
- NAV is armed, and the aircraft reaches the capture zone of the flight plan active leg, or
- The flight crew activates a DIR TO on the MCDU, or

L2 This is not applicable, if LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C, LAND, FLARE, ROLL OUT is engaged below 700 ft RA.

L1
- The flight crew selects the HDG/TRK when the aircraft is close to (within ~1 NM of) the active flight plan leg.

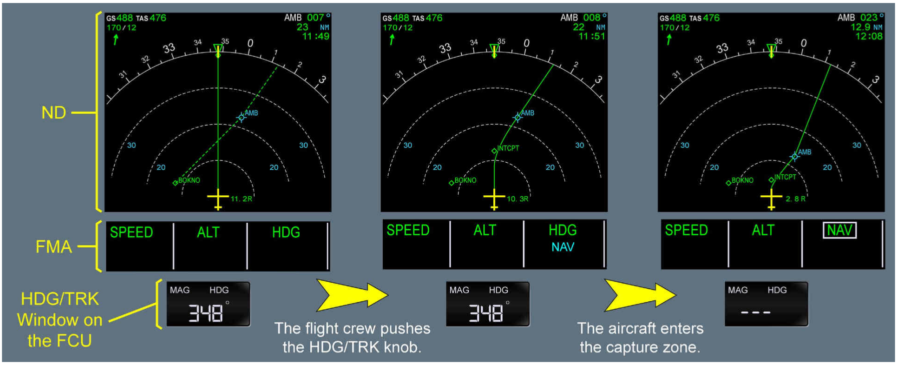
When NAV is engaged, the HDG/TRK window on the FCU displays dashes.

CAPTURE ZONE OF THE FLIGHT PLAN ACTIVE LEG

When NAV is armed, it automatically engages, if:

- The aircraft track line intercepts the flight plan between the FROM and the TO waypoints, and
- The intercept waypoint (INTCPT) is displayed on the ND, and
- The aircraft reaches the capture zone of the flight plan active leg.

The following is an example:



The flight crew pushes the HDG/TRK knob.

The aircraft enters the capture zone.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-20-00019646.0003001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

For NAV engagement, the lateral flight plan must be available.

NAV engages, if one of the following occurs:

- NAV is armed, and the aircraft reaches 30 ft RA after takeoff, or
- NAV is armed, and the aircraft reaches the capture zone of the flight plan active leg, or
- The flight crew activates a DIR TO on the MCDU, or

L2 This is not applicable, if LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C, LAND, FLARE, ROLL OUT is engaged below 700 ft RA.

L1
- The flight crew selects the HDG/TRK when the aircraft is close to (within ~1 NM of) the active flight plan leg, or
- The flight crew initiates a go-around above 100 ft RA, and the aircraft reaches the capture zone of the flight plan active leg.

L2 This is not applicable if a HDG/TRK was preset.

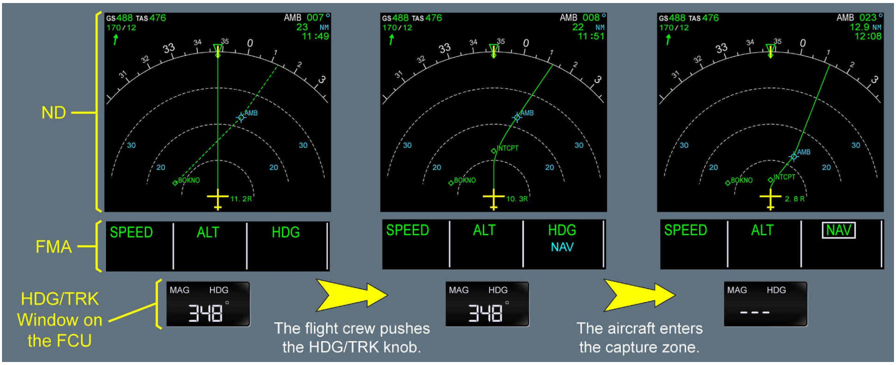
L1 When NAV is engaged, the HDG/TRK window on the FCU displays dashes.

CAPTURE ZONE OF THE FLIGHT PLAN ACTIVE LEG

When NAV is armed, it automatically engages, if:

- The aircraft track line intercepts the flight plan between the FROM and the TO waypoints, and
- The intercept waypoint (INTCPT) is displayed on the ND, and
- The aircraft reaches the capture zone of the flight plan active leg.

The following is an example:


ND
FMA
HDG/TRK Window on the FCU
GS488 TAS476
170/12
AMB 007°
23 NM
11:49
AMB
BOKNO
11. 2R
SPEED
ALT
HDG
MAG HDG
348°
AMB 008°
22 NM
11:51
INTCPT
10. 3R
HDG
NAV
AMB 023°
12.9 NM
12:08
2. 8R
NAV

The flight crew pushes the HDG/TRK knob.

The aircraft enters the capture zone.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-30-20-A-00019647.0004001 / 04 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

NAV disengages, when HDG, TRACK, LOC *, F-LOC * ◁ , LOC B/C *, or GA TRK engages.

REVERSIONS

NAV disengages, and reverts to the HDG/TRACK mode when:

- The aircraft reaches a flight plan discontinuity
- The flight plan becomes invalid.

Note: *When the lateral mode reverts to HDG/TRACK, the vertical mode also reverts to a vertical selected mode.*

For more information about the reversion to HDG/TRACK, *Refer to DSC-22_30-40-30-10 Engagement Conditions 1*

Ident.: DSC-22_30-40-30-20-A-00019647.0001001 / 04 MAY 23
Applicable to: LV-GKO, LV-GKP

NAV disengages, when one of the following conditions is applicable:
- HDG, TRACK, LOC *, F-LOC * ◁ , LOC B/C *, or GA TRK engages, or
- if at MDA-50, APP NAV mode engages.

REVERSIONS

NAV disengages, and reverts to the HDG/TRACK mode when:
- The aircraft reaches a flight plan discontinuity
- The flight plan becomes invalid.

Note: *When the lateral mode reverts to HDG/TRACK, the vertical mode also reverts to a vertical selected mode.*

For more information about the reversion to HDG/TRACK, *Refer to DSC-22_30-40-30-10 Engagement Conditions 1*.

Ident.: DSC-22_30-40-30-20-A-00019793.0001001 / 18 MAY 22
Applicable to: ALL

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

INTERACTIONS WITH VERTICAL MODES

Ident.: DSC-22_30-40-30-20-00019648.0001001 / 18 MAY 22
Applicable to: ALL

When NAV is engaged with the managed vertical modes CLB or DES or FINAL APP, the guidance takes into account the altitude and speed constraints, linked to waypoints on the lateral flight plan. When NAV disengages, the managed vertical modes are not available and the altitude constraints are disregarded.

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OP CLB Mode

GENERAL

Ident.: DSC-22_30-40-40-10-00022133.0001001 / 18 MAY 22
Applicable to: ALL

OP CLB mode is a selected vertical mode.
OP CLB guides the aircraft vertically to the FCU selected altitude. All altitude constraints are disregarded.

When OP CLB is engaged:
- OP CLB controls the speed/Mach target (selected or managed)
- If the A/THR is active, the A/THR will control the thrust.

OP CLB usually arms before it engages.

ARMING CONDITIONS

Ident.: DSC-22_30-40-40-10-00022134.0001001 / 18 MAY 22
Applicable to: ALL

OP CLB arms, when all of the following conditions are applicable:
- The aircraft is on ground, or SRS is engaged (TO or GA), and
- NAV is neither armed nor engaged, or the vertical flight plan is not available, and
- The ACCEL altitude is available and below the FCU selected altitude.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-40-10-00022135.0001001 / 18 MAY 22
Applicable to: ALL

OP CLB disarms, when one of the following occurs:
- V/S / FPA or OP CLB engages, or
- The ACCEL altitude becomes equal to, or above the FCU selected altitude, or
- CLB arms.

ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-40-10-A-00022136.0001001 / 18 MAY 22

L2 The OP CLB mode can only engage, when all of the following are applicable:
- LAND or FLARE is not engaged, and
- If SRS GA is engaged, the aircraft is above 100 ft RA, and
- The aircraft is airborne for at least 5 s.

L1 OP CLB mode engages, when one of the following are applicable:
- The FCU selected altitude is above the aircraft altitude, and the flight crew pulls the ALT knob, or
- SRS TO or SRS GA is engaged with OP CLB armed, and the aircraft reaches the ACCEL altitude.

Ident.: DSC-22_30-40-40-10-A-00022138.0001001 / 18 MAY 22

REVERSIONS TO OP CLB

OP CLB also engages, when one of the following reversions occurs:
- CLB and NAV are engaged, and NAV disengages, or
- L2 CLB is engaged, and the vertical flight plan becomes invalid, or
- CLB is engaged, and the FMS flight phase changes to the descent or approach phase, or
- L1 SRS TO, or SRS GA is engaged, the FCU selected altitude is above the aircraft altitude, and the flight crew pulls the SPD/MACH knob.

Ident.: DSC-22_30-40-40-10-A-00022142.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

OP CLB ASSOCIATION WITH ALTITUDE MODES

Ident.: DSC-22_30-40-40-10-00022137.0001001 / 18 MAY 22
Applicable to: ALL

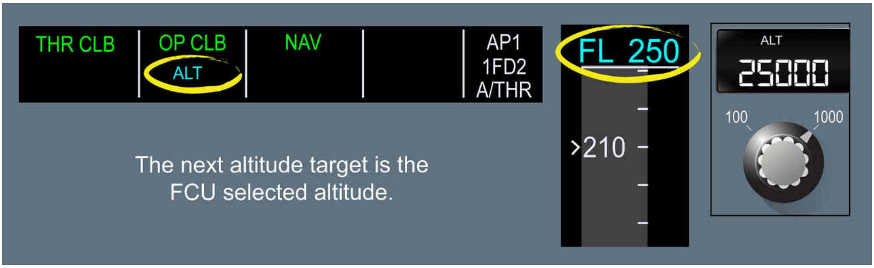
OP CLB ASSOCIATION WITH ALTITUDE MODES

OP CLB is always associated to an altitude mode.
When OP CLB is engaged:

Conditions	The FMA displays the following message on Line 2 of the "AP/FD Verticl Modes" column:
The next altitude target is the FCU selected altitude. In addition, the FCU selected altitude is not set to the cruise altitude.	ALT is armed
The next altitude target is the cruise altitude. In this case, the FCU selected altitude is equal to the cruise altitude. *Note:* *The cruise altitude is defined on the PROG page.*	ALT CRZ is armed

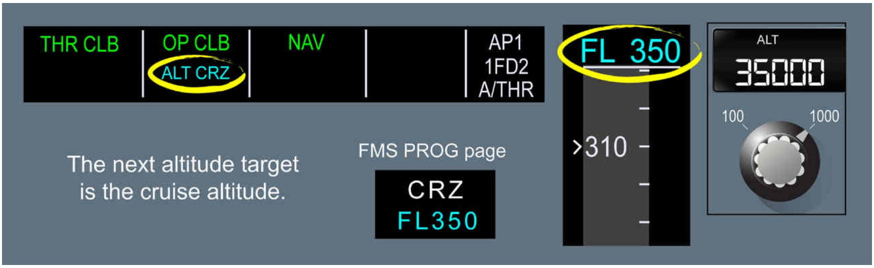
The following are examples:

OP CLB and ALT armed


THR CLB
OP CLB
ALT
NAV
AP1
1FD2
A/THR
FL 250
>210
ALT
25000
100
1000

The next altitude target is the FCU selected altitude.

OP CLB and ALT CRZ armed


THR CLB
OP CLB
ALT CRZ
NAV
AP1
1FD2
A/THR
FMS PROG page
CRZ
FL350
FL 350
>310
ALT
35000
100
1000

The next altitude target is the cruise altitude.

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-40-10-B-00022143.0001001 / 18 MAY 22

OP CLB disengages, when another vertical mode engages.

L2 OP CLB disengages, when one of the following occurs:
- ALT is armed, and the aircraft reaches the capture zone of the FCU selected altitude: ALT * engages
- ALT CRZ is armed, and the aircraft reaches the capture zone of the cruise altitude: ALT CRZ* engages.
- The flight crew pushes the ALT knob, when:
  - NAV is engaged
  - The vertical flight plan is available
  - The FMS flight phase is neither the descent, nor the approach phase.

  CLB engages
- The flight crew pulls or pushes the V/S / FPA knob to engage V/S / FPA
- The flight crew pushes the ALT pb to engage ALT.

Ident.: DSC-22_30-40-40-10-B-00022149.0001001 / 18 MAY 22

REVERSIONS

OP CLB reverts to V/S / FPA, when the flight crew sets the FCU selected altitude below the aircraft altitude.

Ident.: DSC-22_30-40-40-10-B-00022150.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

CLB Mode

GENERAL

Ident.: DSC-22_30-40-40-20-00022171.0001001 / 18 MAY 22
Applicable to: ALL

CLB mode is a managed vertical mode.
CLB guides the aircraft vertically along the FMS flight plan, to the FCU selected altitude or to the next altitude constraint, whichever comes first. Therefore, altitude constraints, associated with applicable waypoints, are taken into account.
CLB can only be engaged, when NAV is engaged.

When CLB is engaged:
- AP/FDs controls the speed/Mach target (selected or managed) through the elevators

  Note: The FG system does not adjust the speed/Mach target to match the altitude constraints.

- If the A/THR is active, the A/THR will control the thrust.

CLB usually arms before it engages.

ARMING CONDITIONS

Ident.: DSC-22_30-40-40-20-00022172.0001001 / 18 MAY 22
Applicable to: ALL

CLB arms, when all of the following conditions are applicable:
- The aircraft is on ground, or SRS TO or SRS GA is engaged, and
- NAV is armed or engaged, or the vertical flight plan is available, and
- L2 The altitude set on the FCU is above the current altitude, and
- L1 The ACCEL altitude is available, and is below:
  - the FCU selected altitude, and
  - the next altitude constraint.

L2 CLB also arms, when CLB was previously engaged, and ALT CST* engages. This scenario is possible, when the selected altitude set on the FCU is above the altitude constraint.
L1 The flight crew can display and modify the ACCEL altitude on the PERF TAKEOFF and PERF GO AROUND pages.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-40-20-00022173.0001001 / 18 MAY 22
Applicable to: ALL

CLB disarms, when one of the following occurs:
- Another vertical mode engages, or
- NAV disarms, or NAV disengages, or
- L2 The flight crew sets the FCU target altitude at or below the altitude constraint, when ALT CST* or ALT CST is engaged, or
- The ACCEL altitude becomes equal to, or above the subsequent target altitude, when the aircraft is on ground, or when SRS TO or SRS GA is engaged, or
- L1 The FCU selected altitude is set to be below the aircraft altitude, or
- The FMS flight phase changes to DES or APPR phase.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-40-20-00020336.0001001 / 18 MAY 22
Applicable to: ALL

CLB engages, when all of the following are applicable:
- NAV is engaged, and
- The FMS flight phase is neither DES, APPR, nor go-around phase, and
- The vertical flight plan is valid, and
- The aircraft is airborne for at least 5 s.

CLB mode engages, when one of the following is applicable:
- SRS TO or SRS GA is engaged with CLB armed, and the aircraft reaches the ACCEL altitude, or
- ALT CST is engaged with CLB armed, and the aircraft sequences the altitude constraint, or
- The FCU selected altitude is set to be above the aircraft altitude, and the flight crew pushes the ALT knob.
  This scenario is applicable if CLB is not yet armed.

  Note: *If the aircraft altitude is within the capture zone of the FCU selected altitude, CLB will immediately disengage, and ALT* will engage.*

CLB ASSOCIATION WITH ALTITUDE MODES

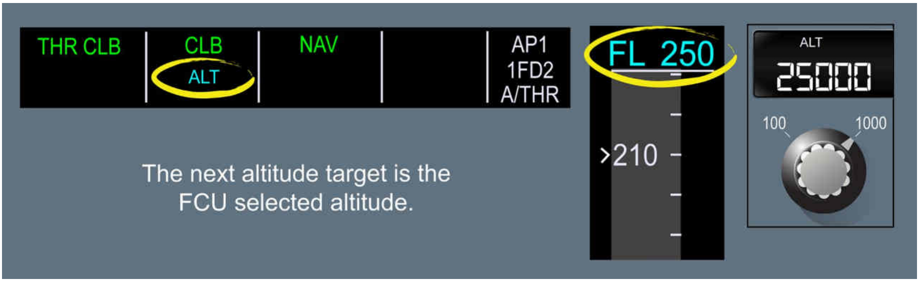
Ident.: DSC-22_30-40-40-20-00022132.0001001 / 04 MAY 23
Applicable to: ALL

CLB is always associated to an altitude mode.
When CLB is engaged:

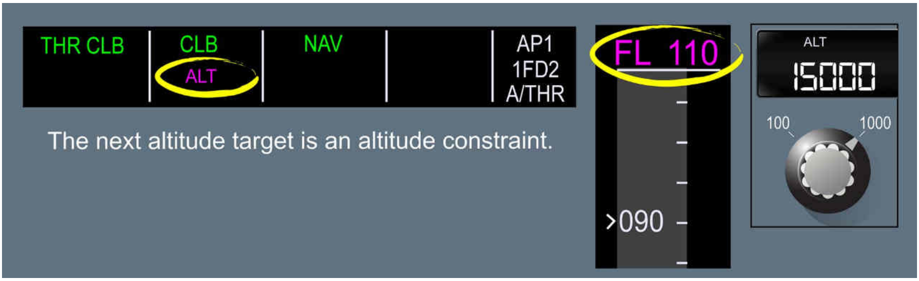
Conditions	The FMA displays the following message on Line 2 of the "AP/FD Vertical Modes" column:
The next altitude target is the FCU selected altitude. In addition, the FCU selected altitude is not set to the cruise altitude. However, the FCU selected altitude can be equal to an altitude constraint.	ALT is armed
The next altitude target is an altitude constraint, and the FCU selected altitude is above the altitude constraint.	ALT CST is armed
The next altitude target is the cruise altitude. In this case, the FCU selected altitude is equal to the cruise altitude. *Note:* *The cruise altitude is defined in the FMS PROG page.*	ALT CRZ is armed

The following are examples:

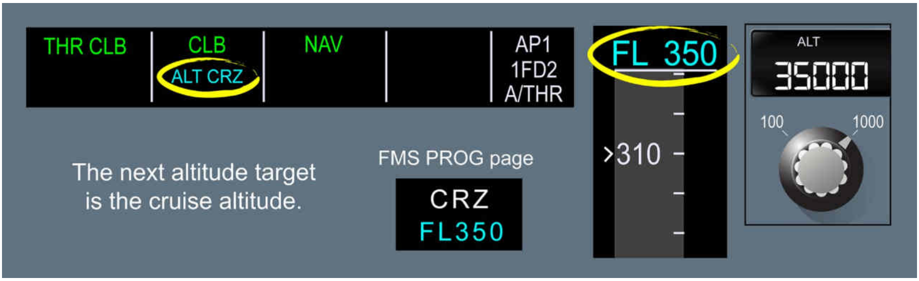
ALT arms


THR CLB
CLB
ALT
NAV
AP1
1FD2
A/THR
FL 250
210
ALT
25000
100
1000
The next altitude target is the FCU selected altitude.

ALT CST arms


THR CLB
CLB
ALT
NAV
AP1
1FD2
A/THR
FL 110
090
ALT
15000
100
1000
The next altitude target is an altitude constraint.

ALT CRZ arms


THR CLB
CLB
ALT CRZ
NAV
AP1
1FD2
A/THR
FL 350
>310
ALT
35000
100
1000
The next altitude target is the cruise altitude.
FMS PROG page
CRZ
FL350

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-40-20-A-00022551.0001001 / 18 MAY 22

CLB disengages, when another vertical mode engages.

Ident.: DSC-22_30-40-40-20-A-00022552.0001001 / 04 MAY 23

REVERSIONS

CLB also disengages, when one of the following reversions occurs:

- NAV disengages when:
  - The aircraft reaches a flight plan discontinuity, or
  - The next altitude target is an altitude constraint, and the flight crew engaged the HDG/TRACK mode.

  OP CLB engages
- The flight crew sets the FCU selected altitude below the aircraft altitude: V/S / FPA engages
- The vertical flight plan becomes invalid: OP CLB engages
- The FMS flight phase changes to DES or APPR phase: OP CLB engages.

Ident.: DSC-22_30-40-40-20-A-00022553.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT

GENERAL

Ident.: DSC-22_30-40-50-10-A-00025247.0001001 / 18 MAY 22
Applicable to: ALL

ALT* mode guides the aircraft to acquire the selected FCU altitude.
ALT mode maintains the selected FCU altitude.

The ALT* mode:
- Has an internal V/S guidance that is a direct function of the difference between present altitude and the altitude target
- Has an internal protection that decreases the vertical speed when VLS or VMAX is reached. (VLS or VMAX becomes the priority target)

Ident.: DSC-22_30-40-50-10-A-00025797.0002001 / 18 MAY 22
Applicable to: LV-GHQ, LV-GIF

- In the case of TA, in order to avoid spurious RA, automatically adjusts the V/S to reach the target altitude

Ident.: DSC-22_30-40-50-10-A-00025798.0001001 / 18 MAY 22
Applicable to: ALL

The system switches automatically to ALT mode when the altitude deviation becomes less than 40 ft.

Note: *If the baro setting is changed during ALT* mode, this may lead to an FCU target overshoot due to the change of the current value of the altitude. However ALT* mode will enable the FCU altitude to be regained.*

ALT ARMING CONDITIONS

Ident.: DSC-22_30-40-50-10-00025248.0001001 / 04 MAY 23
Applicable to: ALL

ALT arms, with FD/AP engaged, when the aircraft climbs or descends toward the FCU selected altitude.
However, ALT does not arm, when one of the following modes is engaged: G/S*, G/S, F-G/S* ◁ , F-G/S ◁ , FINAL APP, LAND, FLARE, ROLL OUT.

L2 ALT arms, if one of the following conditions occurs:
- The flight crew changes the altitude target on the FCU, or
- The flight crew changes the barometric reference (QNH, QFE, or STD) on the EFIS CP, or
- The AP/FD TCAS ◁ mode engages, or
- The difference between the aircraft altitude and the altitude set on the FCU is more than 250 ft.

L1 ALT arms, when one of the following occurs:
- OP CLB engages, and the FCU selected altitude is not set to the cruise altitude, or
- OP DES engages, or
- CLB engages, when the next altitude target is:
  - Equal to the FCU selected altitude
  - Not equal to the cruise altitude.
- DES engages, and the next altitude target is the FCU selected altitude, or
- V/S / FPA engages, and the next altitude target is the FCU selected altitude, or
- SRS TO or SRS GA engages, and the altitude target set on the FCU is above the current aircraft altitude.

ALT DISARMING CONDITIONS

Ident.: DSC-22_30-40-50-10-00025249.0001001 / 18 MAY 22
Applicable to: ALL

ALT disarms when one of the following occurs:
- ALT* engages, or
- G/S*, F-G/S* ◁ , or FINAL APP engages, or
- ALT CST arms.

ALT* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-10-00025250.0001001 / 18 MAY 22
Applicable to: ALL

ALT* engages, when ALT is armed, and the aircraft reaches the capture zone of the altitude target.
L2 ALT* engagement is inhibited during 3 s after the selected alititude is changed on the FCU.

ALT* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-10-B-00025254.0001001 / 18 MAY 22

ALT* disengages when another vertical mode engages.

Ident.: DSC-22_30-40-50-10-B-00025265.0001001 / 18 MAY 22

REVERSIONS

ALT* reverts to V/S / FPA when the flight crew changes the FCU selected altitude by more than 250 ft.

Ident.: DSC-22_30-40-50-10-B-00025266.0001001 / 18 MAY 22

If within 5 s after reversion to V/S / FPA, to confirm the altitude target change, the flight crew does not:

- Pull the ALT knob, or
- Set a new V/S / FPA target, or
- Push the ALT pb on the FCU.

Then:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-10-00025255.0001001 / 18 MAY 22
Applicable to: ALL

ALT engages, when ALT* is engaged, and the aircraft reaches the altitude target.
L2 The aircraft is at the altitude target when the difference between the aircraft altitude and the altitude target is less than 40 ft for more than two seconds.

ALT engages, when one of the following occurs:

- The flight crew presses the ALT pb, or
- ALT CST is engaged, and the flight crew sets the FCU selected altitude to the altitude constraint, or
- ALT CST is engaged, and NAV disengages.

ALT DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-10-C-00025256.0001001 / 18 MAY 22

ALT disengages, when any other vertical mode engages.

Ident.: DSC-22_30-40-50-10-C-00025267.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

ALT manually disengages, when one of the following occurs:

- The flight crew pulls the ALT knob: OP CLB or OP DES engages
- The flight crew pushes the ALT knob, and all of the following conditions are applicable:
  - The FCU selected altitude is above the aircraft altitude
  - NAV is engaged
  - The FMS flight phase is neither descent, nor approach.

  CLB engages
- The flight crew pushes the ALT knob, and all of the following conditions are applicable:
  - The FCU selected altitude is below the aircraft altitude
  - One of the following mode is engaged : NAV, LOC *, LOC, LOC B/C*, LOC B/C
  - The FMS flight phase is not one of the following: takeoff, climb, go-around.

  DES engages
- L2 The flight crew pushes the ALT knob, and all of the following conditions are applicable:
  - The aircraft altitude is equal to the altitude constraint
  - The FCU selected altitude is set above the aircraft altitude

    The FCU selected altitude is at least 250 ft above the aircraft altitude
  - NAV is engaged
  - The FMS flight phase is neither descent, nor approach.

  ALT CST engages
- The flight crew pushes the ALT knob, and all of the following conditions are applicable:
  - The aircraft altitude is equal to the altitude constraint
  - The FCU selected altitude is set below the aircraft altitude

    The FCU selected altitude is at least 250 ft below the aircraft altitude
  - One of the following mode is engaged : NAV, LOC *, LOC, LOC B/C*, LOC B/C
  - The FMS flight phase is not one of the following: takeoff, climb, go-around.

  ALT CST engages
- The aircraft altitude is equal to the FCU selected altitude, and the flight crew sets the cruise altitude to the aircraft altitude: ALT CRZ engages
- L1 The flight crew pulls or pushes the V/S / FPA knob: V/S / FPA engages
- The flight crew engages go-around: SRS GA engages.

Ident.: DSC-22_30-40-50-10-C-00025301.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

ALT automatically disengages, when one of the following occurs:

Ident.: DSC-22_30-40-50-10-C-00025156.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
  - LOC* or LOC is engaged
  - G/S is armed

  G/S* engages

Ident.: DSC-22_30-40-50-10-C-00025157.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S ◁ capture zone when:
  - LOC*, LOC, F-LOC ◁ * or F-LOC ◁ is engaged, and
  - F-G/S ◁ is armed.

  F-G/S* ◁ engages

Ident.: DSC-22_30-40-50-10-C-00025158.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
  - APP NAV is engaged
  - FINAL is armed

  FINAL APP engages.

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ALT CST

GENERAL

Ident.: DSC-22_30-40-50-20-A-00025260.0001001 / 18 MAY 22
Applicable to: ALL

ALT CST* guides the aircraft to acquire an altitude constraint.
ALT CST maintains the altitude constraint delivered by the FMS.

The ALT CST* mode:

- Has an internal V/S guidance that is a direct function of the difference between present altitude and the altitude target
- Has an internal protection that decreases the vertical speed when VLS or VMAX is reached. (VLS or VMAX becomes the priority target)

Ident.: DSC-22_30-40-50-20-A-00025799.0002001 / 18 MAY 22
Applicable to: LV-GHQ, LV-GIF

- In the case of TA, in order to avoid spurious RA, automatically adjusts the V/S to reach the target altitude

Ident.: DSC-22_30-40-50-20-A-00025800.0001001 / 18 MAY 22
Applicable to: ALL

The system switches automatically to ALT CST mode when the altitude deviation becomes less than 40 ft.

Note: *For aircraft equipped with QFE option, a switching from STD to QFE (or QFE to STD) in ALT CST* mode, will change the target value and a reversion to V/S may occur if the target value is modified by 250 ft or more.*

ALT CST ARMING CONDITIONS

Ident.: DSC-22_30-40-50-20-00025262.0001001 / 18 MAY 22
Applicable to: ALL

ALT CST arms, with FD/AP engaged, when the aircraft climbs or descends toward an altitude constraint delivered by the FMS.
However, ALT CST does not arm, when one of the following mode is engaged: G/S*, G/S, F-G/S* ◁*, F-G/S ◁*, FINAL APP, LAND, FLARE, ROLL OUT.

L2 ALT CST arms, if one of the following condition occurs:

- The flight crew changes the barometric reference (QNH, QFE, or STD) on the EFIS CP, or
- The AP/FD TCAS ◁✳ mode engages, or
- The difference between the aircraft altitude and the altitude constraint delivered by the FMS is more than 250 ft.

L1 ALT CST arms, when CLB (DES) engages, and:

- The next altitude target is an altitude constraint delivered by the FMS, and
- The FCU selected altitude is above (below) the altitude constraint.

ALT CST DISARMING CONDITIONS

Ident.: DSC-22_30-40-50-20-00025263.0001001 / 18 MAY 22
Applicable to: ALL

ALT CST disarms when one of the following occurs:

- ALT CST* engages, or
- G/S*, F-G/S* ◁✳ , or FINAL APP engages, or
- CLB is engaged, and one of the following occurs:
  - The FCU selected altitude becomes the next altitude target, or
  - OP CLB or V/S / FPA engages.
- DES is engaged, and one of the following occurs:
  - The FCU selected altitude becomes the next altitude target, or
  - OP DES or V/S / FPA engages, or
  - SRS GA engages.

ALT CST* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-20-00025271.0001001 / 18 MAY 22
Applicable to: ALL

ALT CST* engages, when ALT CST is armed, and the aircraft reaches the capture zone of the altitude target.

L2 ALT CST* engagement is inhibited during 3 s after the selected altitude is changed on the FCU.

ALT CST* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-20-B-00025272.0001001 / 18 MAY 22

ALT CST* disengages when another vertical mode engages.

Ident.: DSC-22_30-40-50-20-B-00025274.0001001 / 18 MAY 22

REVERSIONS

ALT CST* reverts to V/S / FPA if NAV disengages.

Ident.: DSC-22_30-40-50-20-B-00025275.0001001 / 18 MAY 22

If within 5 s after reversion to V/S / FPA, to confirm the altitude target change, the flight crew does not:
- Pull the ALT knob, or
- Set a new V/S / FPA target, or
- Push the ALT pb on the FCU.

Then:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT CST ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-20-00025276.0001001 / 18 MAY 22
Applicable to: ALL

ALT CST engages, when ALT CST* is engaged, and the aircraft reaches the altitude target.

L2 ALT CST engages, when one of the following occurs:
- The flight crew pushes the ALT knob, and all the following conditions are applicable:
  - ALT is engaged, and
  - The aircraft altitude is equal to the altitude constraint, and
  - The FCU selected altitude is set above the aircraft altitude
    The FCU selected altitude is at least 250 ft above the aircraft altitude
  - NAV is engaged, and
  - The FMS flight phase is neither descent, nor approach, and
  - The vertical flight plan is valid.

  CLB arms, or
- The flight crew pushes the ALT knob, and all the following conditions are applicable:
  - ALT is engaged, and
  - The aircraft altitude is equal to the altitude constraint, and
  - The FCU selected altitude is set below the aircraft altitude, and
    The FCU selected altitude is at least 250 ft below the aircraft altitude
  - One of the following modes is engaged: NAV, LOC*, LOC, LOC B/C*, LOC B/C, F-LOC*, F-LOC and
  - The FMS flight phase is not one of the following: takeoff, climb, go-around.

  DES arms.

ALT CST DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-20-C-00025277.0001001 / 18 MAY 22

ALT CST disengages, when any other vertical modes engages.

Ident.: DSC-22_30-40-50-20-C-00025273.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

ALT CST manually disengages, when one of the following occurs:
- The flight crew pulls the ALT knob: OP CLB or OP DES engages
- The flight crew pulls or pushes the V/S / FPA knob: V/S / FPA engages
- The flight crew sets the altitude target on the FCU to the altitude constraint: ALT engages
- The flight crew removes the altitude constraint: CLB or DES engages
- The flight crew engages go-around: SRS GA engages.

Ident.: DSC-22_30-40-50-20-C-00025302.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

ALT CST automatically disengages, when one of the following occurs:
- The aircraft sequences the waypoint, for which the altitude constraint is associated
- NAV disengages: ALT engages

Ident.: DSC-22_30-40-50-20-C-00025182.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
  - LOC* or LOC is engaged
  - G/S is armed

  G/S* engages

Ident.: DSC-22_30-40-50-20-C-00025184.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S ◁✻ capture zone when:
  - LOC*, LOC, F-LOC ◁✻ * or F-LOC ◁✻ is engaged, and
  - F-G/S ◁✻ is armed.

  F-G/S* ◁✻ engages

Ident.: DSC-22_30-40-50-20-C-00025185.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
  - APP NAV is engaged
  - FINAL is armed

  FINAL APP engages.

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ALT CRZ

GENERAL

Ident.: DSC-22_30-40-50-30-A-00025278.0001001 / 18 MAY 22
Applicable to: ALL

ALT CRZ* mode guides the aircraft to acquire the cruise altitude, as selected on the FMS PROG page and on the FCU.
ALT CRZ mode maintains the cruise altitude, as selected on the FMS PROG page and on the FCU.

The ALT CRZ* mode:
- Has an internal V/S guidance that is a direct function of the difference between present altitude and the altitude target
- Has an internal protection that decreases the vertical speed when VLS or VMAX is reached. (VLS or VMAX becomes the priority target)

Ident.: DSC-22_30-40-50-30-A-00025801.0002001 / 18 MAY 22
Applicable to: LV-GHQ, LV-GIF

- In the case of TA, in order to avoid spurious RA, automatically adjusts the V/S to reach the target altitude

Ident.: DSC-22_30-40-50-30-A-00025802.0001001 / 18 MAY 22
Applicable to: ALL

The system switches automatically to ALT CRZ mode when the altitude deviation becomes less than 40 ft. Once ALT CRZ engages, the A/THR SOFT mode activates (*Refer to DSC-22_30-50-50 A/THR SOFT Mode*).

Note: *If the baro setting is changed during ALT CRZ * mode, this may lead to an FCU target overshoot due to the change of the current value of the altitude. However ALT CRZ * mode will enable the FCU altitude to be regained.*

ALT CRZ ARMING CONDITIONS

Ident.: DSC-22_30-40-50-30-00025279.0001001 / 18 MAY 22
Applicable to: ALL

ALT CRZ arms, with FD/AP engaged, when the aircraft climbs or descends toward the cruise altitude, as selected on the FMS PROG page and on the FCU.
However, ALT CRZ does not arm, when one of the following modes is engaged: G/S*, G/S, F-G/S* ◁ , F-G/S ◁ , FINAL APP, LAND, FLARE or ROLL OUT.

ALT CRZ arms, if one of the following condition occurs:
- The flight crew changes the altitude target on the FCU to the cruise altitude, as selected on the FMS PROG page, or
- ALT CRZ is engaged and the flight crew changes the altitude target on the FCU, or
- The flight crew changes the barometric reference (QNH, QFE, or STD) on the EFIS CP, or
- The AP/FD TCAS ◁ mode engages.

ALT CRZ DISARMING CONDITIONS

Ident.: DSC-22_30-40-50-30-00025280.0001001 / 18 MAY 22
Applicable to: ALL

ALT CRZ disarms when one of the following occurs:
- ALT CRZ* engages, or
- The altitude target on the FCU is set below the cruise altitude: ALT arms.

ALT CRZ* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-30-00025281.0001001 / 18 MAY 22
Applicable to: ALL

ALT CRZ* engages, when one of the following occurs:
- ALT CRZ is armed, and the aircraft reaches the capture zone of the altitude target, or
- ALT CRZ is engaged and the flight crew selects another FCU target altitude within the capture zone.

ALT CRZ* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-50-30-B-00025282.0001001 / 18 MAY 22

ALT CRZ* disengages when another vertical mode engages.

Ident.: DSC-22_30-40-50-30-B-00025286.0001001 / 18 MAY 22

REVERSIONS

ALT CRZ* reverts to V/S / FPA if NAV disengages.

Ident.: DSC-22_30-40-50-30-B-00025287.0001001 / 18 MAY 22

If within 5 s after reversion to V/S / FPA, to confirm the altitude target change, the flight crew does not:
- Pull the ALT knob, or
- Set a new V/S / FPA target, or
- Push the ALT pb on the FCU.

Then:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

ALT CRZ ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-30-00025283.0001001 / 18 MAY 22
Applicable to: ALL

ALT CRZ engages, when ALT CRZ* is engaged, and the aircraft reaches the altitude target.

L2 ALT CRZ engages, when all of the following occur:
- ALT is engaged, and
- The aircraft altitude is equal to the FCU selected altitude, and
- The flight crew sets the cruise altitude to the aircraft altitude.

ALT CRZ DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-50-30-00025284.0001001 / 18 MAY 22
Applicable to: ALL

ALT CRZ disengages, when any other vertical mode engages.

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General

GENERAL

Ident.: DSC-22_30-40-60-10-00025103.0001001 / 18 MAY 22
Applicable to: ALL

During descent, OP DES or DES guides the aircraft vertically to an altitude target, or to a G/S or F-G/S ◁ capture zone.

Intentionally left blank

OP DES Mode

GENERAL

Ident.: DSC-22_30-40-60-20-00025108.0001001 / 18 MAY 22
Applicable to: ALL

OP DES is a vertical selected mode.
When OP DES is engaged, the AP/FD adjusts the pitch in order to maintain a speed/Mach target (selected or managed). The A/THR then maintains idle thrust.
All the altitude constraints are disregarded.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-60-20-00025109.0001001 / 18 MAY 22
Applicable to: ALL

OP DES engages, if the FCU selected altitude is below the aircraft altitude, and the flight crew pulls the ALT knob.

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-60-20-A-00025121.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

OP DES disengages manually, when one of the following occurs:
- The flight crew presses the ALT pb: ALT engages, or
- The flight crew pushes the ALT knob, and all the following conditions are applicable:
  - One of the following modes is engaged: NAV, LOC*, LOC, F-LOC ◁ *, F-LOC ◁ , LOC B/C*, LOC B/C
  - The FCU selected altitude is below the aircraft altitude
  - The FMS flight phase is cruise, or descent
  - The vertical flight plan is valid.

  DES engages, or
- The flight crew pulls or pushes the V/S / FPA knob: V/S / FPA engages, or
- The flight crew engages go-around: SRS GA engages.

Ident.: DSC-22_30-40-60-20-A-00025243.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

OP DES disengages automatically, when one of the following occurs:

- ALT is armed, the aircraft reaches the capture zone of the FCU selected altitude: ALT* engages
- ALT CRZ is armed, and the aircraft reaches the capture zone of the cruise altitude: ALT CRZ* engages

Ident.: DSC-22_30-40-60-20-A-00025246.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
  - LOC* or LOC is engaged
  - G/S is armed

  G/S* engages

Ident.: DSC-22_30-40-60-20-A-00025285.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S ◁ capture zone when:
  - LOC*, LOC, F-LOC ◁ * or F-LOC ◁ is engaged
  - F-G/S ◁ is armed

  F-G/S ◁ * engages

Ident.: DSC-22_30-40-60-20-A-00025110.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone when:
  - APP NAV is engaged
  - FINAL is armed

  FINAL APP engages

Ident.: DSC-22_30-40-60-20-A-00025264.0001001 / 18 MAY 22

- AP/FD TCAS ◁ mode engages.

Ident.: DSC-22_30-40-60-20-A-00025122.0001001 / 18 MAY 22

REVERSION

OP DES reverts to V/S / FPA, if the flight crew sets the FCU selected altitude above the aircraft altitude.

If within 5 s after reversion to V/S / FPA, the flight crew does not confirm the altitude target change by another expected action, then:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

Intentionally left blank

DES Mode

GENERAL

Ident.: DSC-22_30-40-60-30-00025111.0001001 / 18 MAY 22
Applicable to: ALL

DES is a managed vertical mode.
DES guides the aircraft vertically along the vertical flight plan. All the altitude constraints associated to waypoints are taken into account.
When DES is engaged in idle path, the AP/FD adjusts the pitch in order to maintain a speed/Mach target. The A/THR then maintains the idle thrust.
When DES is engaged in geometric path, the AP/FD controls the vertical trajectory. The A/THR is then in SPEED/MACH.

ARMING CONDITIONS

Ident.: DSC-22_30-40-60-30-00025112.0001001 / 18 MAY 22
Applicable to: ALL

DES can only arm when:
- The altitude on the FCU is below the aircraft altitude
- NAV is armed, or engaged
- The FMS flight phase is cruise, descent, or approach
- The vertical flight plan path is valid.

DES arms, when one of the following occurs:
- DES is previously engaged with ALT CST armed, and ALT CST* engages, or
- ALT CST* or ALT CST is engaged, the flight crew pushes the ALT knob and the FMS authorizes DES to arm in accordance with the flight plan.

DISARMING CONDITIONS

Ident.: DSC-22_30-40-60-30-00025113.0001001 / 18 MAY 22
Applicable to: ALL

DES disarms, when one of the following occurs:

- NAV, LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C mode disengages, or
- Another vertical mode engages, or
- ALT CST* or ALT CST is engaged, and the flight crew sets the FCU selected altitude to the altitude constraint, or
- The flight crew sets an altitude on the FCU above the aircraft altitude, or
- The vertical flight plan is lost.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-60-30-00025114.0001001 / 18 MAY 22
Applicable to: ALL

DES engages, when one of the following occurs:
- ALT CST is engaged with DES armed, and the aircraft sequences an ALT CST waypoint, or
- The flight crew pushes the ALT knob, and all the following conditions are applicable:
  - The FCU selected altitude is below the aircraft altitude
  - One of the following lateral modes is engaged: NAV, LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C
  - One of the following vertical modes is engaged: OP DES, V/S / FPA, ALT*, ALT, ALT CRZ*, ALT CRZ, AP/FD TCAS ◁
  - The FMS flight phase is cruise, descent or approach
  - The vertical flight plan is valid.

Note: *DES will not engage if one of the following modes is engaged: G/S*, G/S, F-G/S ◁ *, F-G/S ◁ , FINAL APP, LAND.*

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-60-30-A-00025239.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

DES disengages manually, when one of the following occurs:
- The flight crew pushes the ALT pb: ALT engages
- The flight crew pulls the ALT knob: OP DES engages
- The flight crew pulls or pushes the V/S / FPA knob: V/S / FPA engages
- The flight crew engages go-around: SRS GA engages.

Ident.: DSC-22_30-40-60-30-A-00025240.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

DES disengages automatically, when one of the following occurs:
- The aircraft reaches the capture zone of the FCU selected altitude: ALT* engages
- The aircraft reaches the capture zone of the altitude constraint: ALT CST* engages

Ident.: DSC-22_30-40-60-30-A-00025245.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
  - LOC* or LOC is engaged
  - G/S is armed

  G/S* engages

Ident.: DSC-22_30-40-60-30-A-00025303.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S ◁ capture zone when:
  - LOC*, LOC, F-LOC ◁ * or F-LOC ◁ is engaged, and
  - F-G/S ◁ is armed.

  F-G/S* ◁ engages.

Ident.: DSC-22_30-40-60-30-A-00025115.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
  - APP NAV is engaged
  - FINAL is armed

  FINAL APP engages

Ident.: DSC-22_30-40-60-30-A-00025152.0001001 / 18 MAY 22

- AP/FD TCAS ◁ mode engages.

Ident.: DSC-22_30-40-60-30-A-00025124.0001001 / 18 MAY 22

REVERSIONS

DES reverts to V/S / FPA, when one the following occurs:

- The flight crew sets the FCU selected altitude above the aircraft altitude
- One of the following modes was engaged, and disengages: NAV, LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C
- The vertical flight plan is lost.

Ident.: DSC-22_30-40-60-30-A-00025125.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

GUIDANCE IN DES MODE

Applicable to: ALL

Ident.: DSC-22_30-40-60-30-B-00010273.0001001 / 18 AUG 10

DESCENT INITIATION

The aircraft will not start its descent automatically when reaching the top of descent (T/D). In order to initiate the descent, the flight crew will set the clearance altitude by turning the ALT knob, then pushes the ALT knob.

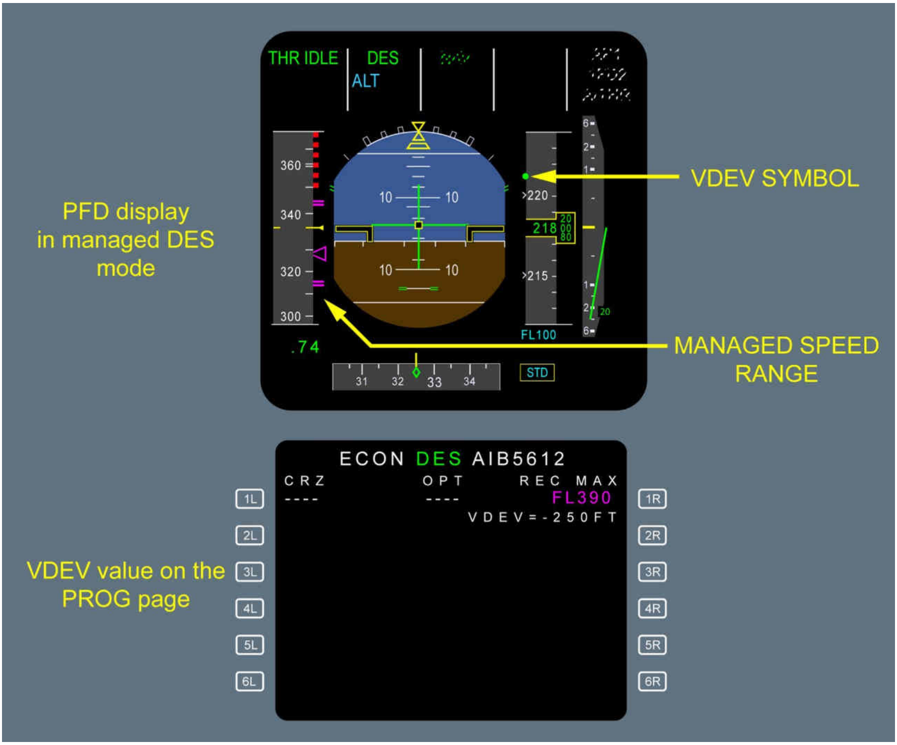
The aircraft will descend immediately:
- If the top of descent is not reached, the aircraft descends at a constant V/S converging on the descent path
- If the aircraft is at or beyond the T/D, it descends at idle thrust.

Ident.: DSC-22_30-40-60-30-B-00010274.0001001 / 15 MAY 23

DURING THE DESCENT

In order to monitor the vertical position of the aircraft, the flight crew will see the following on the PFD:
- Vertical deviation symbol (VDEV) along the ALT scale, and
- VDEV value on the FMS PROG page.

The aircraft may deviate from the DES profile while the DES mode is engaged if:
- Unexpected wind conditions are encountered
- Anti-icing is turned on
- The flight crew modifies the lateral flight plan.


THR IDLE
DES
ALT
360
340
320
300
10
10
10
10
220
218
20
00
80
215
6
2
1
1
2
6
20
FL100
.74
31
32
33
34
STD
PFD display in managed DES mode
VDEV SYMBOL
MANAGED SPEED RANGE
VDEV value on the PROG page
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
      ECON DES AIB5612
CRZ          OPT       REC MAX
----         ----        FL390
                   VDEV=-250FT
```

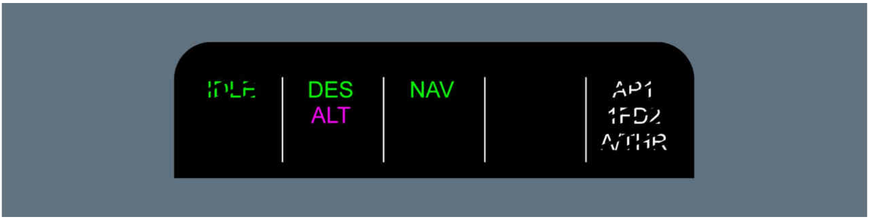
When the speed is managed, a target speed range appears on the PFD. It defines acceptable speed variations around the nominal descent speed target (limited to ± 20 kt).

Ident.: DSC-22_30-40-60-30-B-00010275.0001001 / 15 MAY 23

FMA DISPLAY

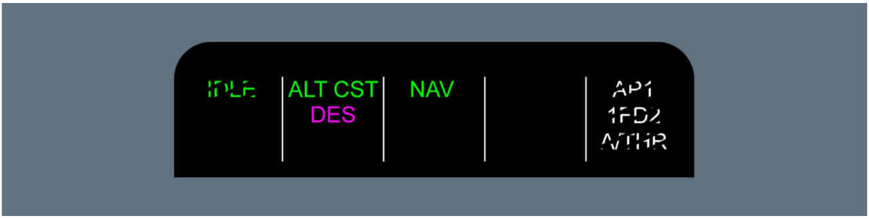
When DES mode is engaged, the FMGES arms ALT and displays the applicable target altitude on the altitude scale of the PFD.
Depending on the situation, the FMA may display one of the following cases:

THE NEXT PREDICTED LEVEL-OFF IS AN ALTITUDE CONSTRAINT


IDLE
DES
ALT
NAV
AP1
1FD2
A/THR

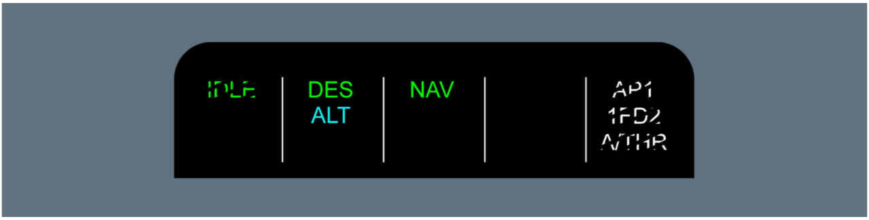
The PFD displays the altitude constraint in magenta, on or below the altitude scale.

THE AIRCRAFT FLIES AN ALTITUDE CONSTRAINT


IDLE
ALT CST
DES
NAV
AP1
1FD2
A/THR

When the FMS sequences the waypoint that holds the altitude constraint, DES engages again automatically.

THE NEXT PREDICTED LEVEL-OFF IS THE FCU ALTITUDE

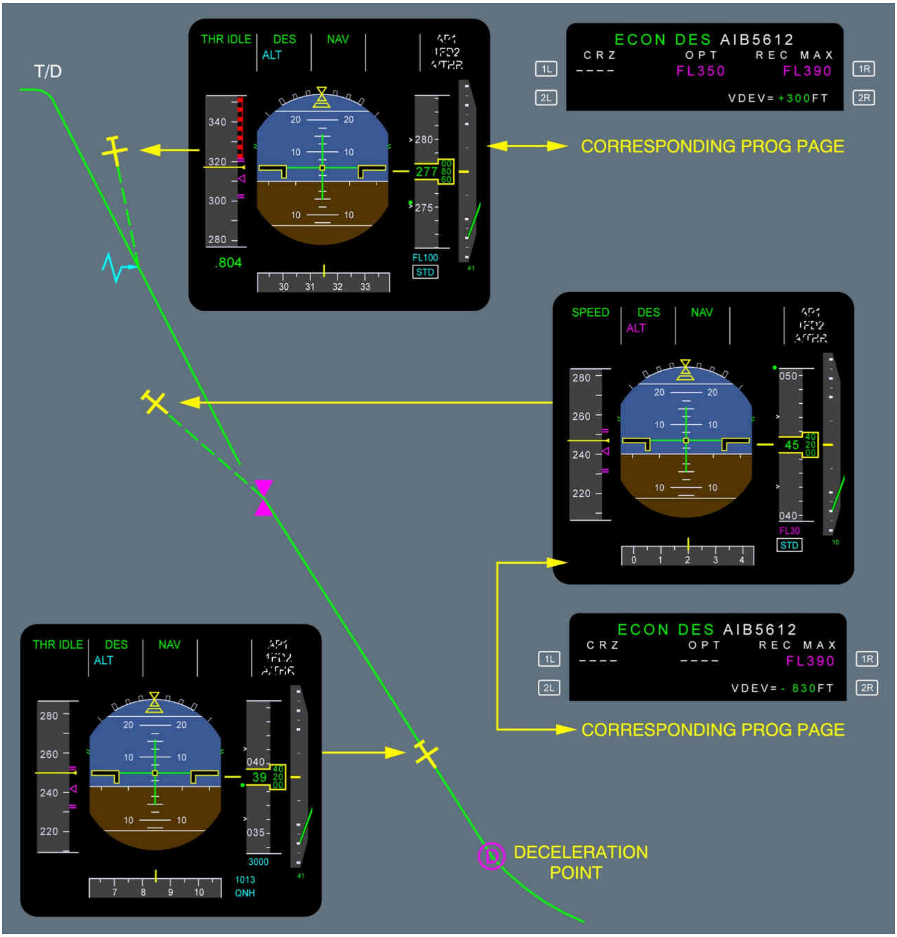

IDLE
DES
ALT
NAV
AP1
1FD2
A/THR

The PFD displays the FCU selected altitude in blue, on or below the altitude scale.

DES MODE PROFILE

Ident.: DSC-22_30-40-60-30-C-00010315.0001001 / 15 MAY 23
Applicable to: ALL

GENERAL


T/D
THR IDLE
DES
ALT
NAV
AP1
1FD2
A/THR
.804
FL100
STD
ECON DES AIB5612
CRZ
OPT
REC MAX

FL350
FL390
VDEV=+300FT
1L
2L
1R
2R
CORRESPONDING PROG PAGE
SPEED
DES
ALT
NAV
AP1
1FD2
A/THR
FL30
STD
ECON DES AIB5612
CRZ
OPT
REC MAX

FL390
VDEV=- 830FT
CORRESPONDING PROG PAGE
THR IDLE
DES
ALT
NAV
AP1
1FD2
A/THR
3000
1013
QNH
D
DECELERATION
POINT

Ident.: DSC-22_30-40-60-30-C-00010314.0001001 / 15 MAY 23
Applicable to: ALL

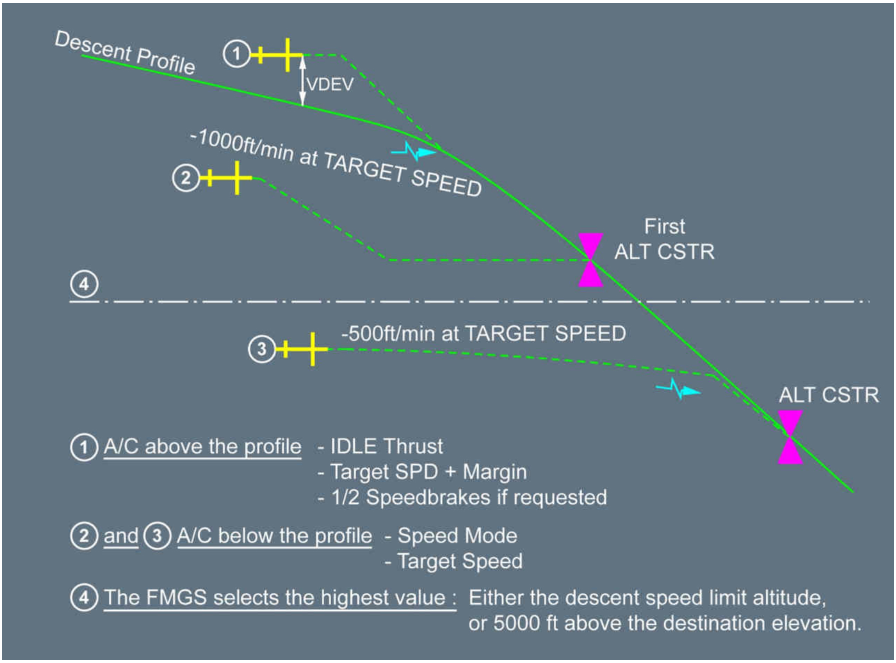
INTERCEPT POINT

Associated with the VDEV displayed on PFD, the ND shows an intercept point (↯) on the flight plan. It indicates the position where the system predicts that the aircraft will intercept the descent profile.

Ident.: DSC-22_30-40-60-30-C-00010277.0001001 / 15 MAY 23
Applicable to: ALL

INTERCEPTION OF THE DESCENT VERTICAL PROFILE

The different cases of interception of the vertical profile are described as follows.



① A/C above the profile - IDLE Thrust
- Target SPD + Margin
- 1/2 Speedbrakes if requested

② and ③ A/C below the profile - Speed Mode
- Target Speed

④ The FMGS selects the highest value : Either the descent speed limit altitude, or 5000 ft above the destination elevation.

AIRCRAFT ABOVE THE DESCENT PROFILE

If the aircraft is above the descent profile, the speed will increase toward the upper limit of the managed speed range. If the speed reaches the upper limit, the aircraft will maintain the speed but will deviate from the profile (autothrust at idle).

The pseudo waypoint (intercept point) appears on the ND along the flight plan. The FMS assumes that the aircraft will return to the profile using:
- Idle thrust
- Half speedbrakes extension
- ECON speed plus a margin (until intercepting the profile).

If necessary, the message "EXTEND SPD BRK" comes up on the FMA and the MCDU, scratchpad and remains there as long as more drag (speedbrakes) is still required. The flight crew should respond to this message by extending half speedbrakes.
Whenever the intercept point is predicted to be close to a constrained waypoint, the FMA and MCDU scratchpad display an "EXTEND SPD BRK" message.

Note: *With DES mode engaged, the speedbrakes extension will not necessarily increase the descent rate. It increases only if the aircraft is above path.*

AIRCRAFT BELOW THE DESCENT PROFILE

If the aircraft is below the descent profile, its speed will be maintained at target speed until it reaches the descent profile. The lower margin becomes effective when the aircraft is on the descent profile but has to loose speed in order to stay on it.
The intercept point on the navigation display is based on the following assumptions:

- **If the aircraft is flying at an altitude that is higher than both the descent speed limit altitude and the destination elevation +5 000 ft:**
  The FMGES maintains a V/S of -1 000 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.
- **If the aircraft is flying at an altitude that is lower than either the descent speed limit altitude, or the destination elevation +5 000 ft:**
  The FMGES maintains a V/S of -500 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.

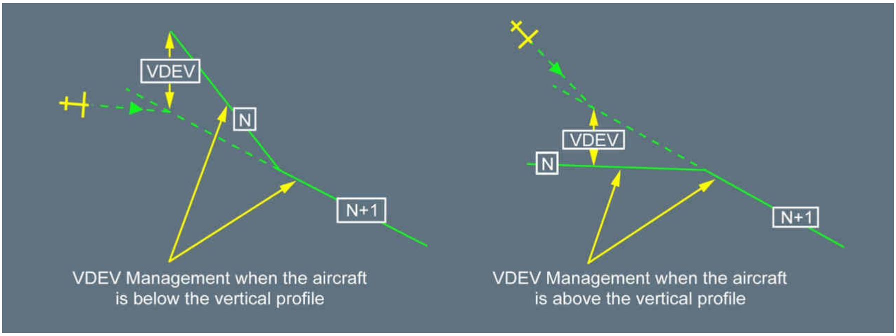
Ident.: DSC-22_30-40-60-30-C-00010316.0002001 / 15 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

VERTICAL DEVIATION (VDEV) MANAGEMENT CHARACTERISTIC

In some cases, when the aircraft is above or below the vertical profile, the ND may not display any intercept point (pseudo waypoint), even if the VDEV appears on both the MCDUs and PFDs. In addition, the FMS guidance may not immediately attempt to decrease this VDEV (contrary to flight crew expectations).

This is due to the fact that the FMS guides the aircraft along the extension of the subsequent segment (N+1), when all of the following conditions are met:
- The aircraft is above or below the descent profile
- The DES mode is active, or the FINAL APP mode is armed
- The aircraft intercepts the extension of the subsequent segment (N+1) of the vertical profile, before the aircraft reaches the initially expected segment (N), as illustrated below.

The VDEV will gradually decrease until the aircraft reaches the beginning of the subsequent segment.


VDEV
N
N+1
VDEV Management when the aircraft is below the vertical profile
VDEV
N
N+1
VDEV Management when the aircraft is above the vertical profile

Note: *For the particular case of FINAL APP mode, the FMS guides the aircraft along the extension of the subsequent segment only if the VDEV is less than 150 ft.*

Ident.: DSC-22_30-40-60-30-C-00010281.0001001 / 15 MAY 23
Applicable to: ALL

LEVELLING OFF AT A CONSTRAINT

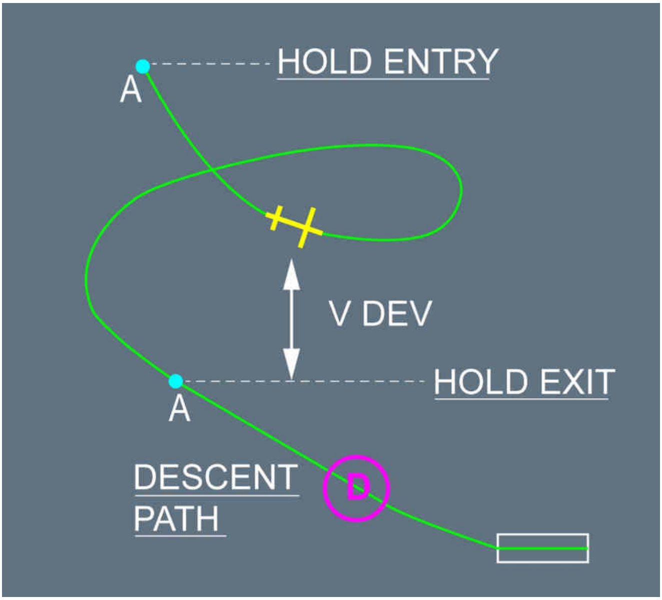
If the aircraft levels off at an altitude constraint, the DES mode arms. DES remains armed until the FMS sequences the waypoint that holds the altitude constraint. Then DES mode engages again (if the FCU altitude is set below the altitude of the constraint).
If the FCU selected altitude is an altitude constraint, the flight crew may continue the descent below that altitude by turning and then pushing the ALT knob. This arms the DES mode. When the FMS sequences the waypoint that holds the altitude constraint, the DES mode engages again.

Ident.: DSC-22_30-40-60-30-C-00010283.0001001 / 15 MAY 23
Applicable to: ALL

GUIDANCE IN A HOLD

Just before the aircraft enters a holding pattern, the speed target becomes the holding speed.
In the holding pattern, the DES mode commands a V/S of -1 000 ft while A/THR maintains the holding speed. The aircraft levels off at the next altitude constraint if it is reached during the hold.

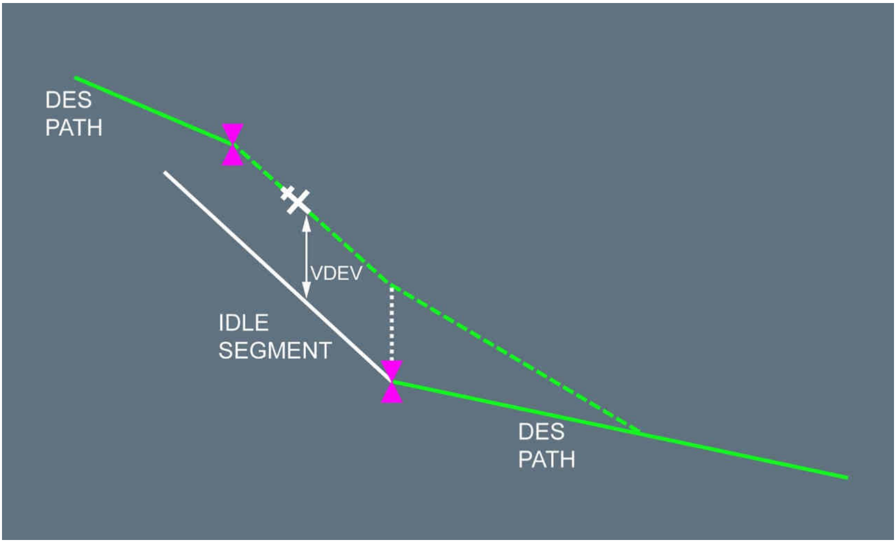
The FMS predicts the altitude at which the aircraft must cross the exit fix in order to be positioned on the descent profile. The current vertical deviation VDEV is based on this altitude.
Until the aircraft exits the hold, the DES mode maintains a V/S of -1 000 ft/min considering downpath vertical constraints. This ensures that the aircraft will not descend below the next altitude constraint. If the aircraft reaches the next altitude constraint, the aircraft levels off and ALT CST mode engages.



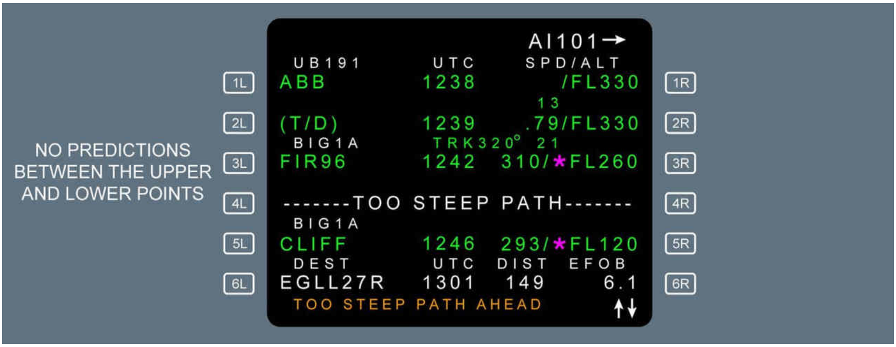
Ident.: DSC-22_30-40-60-30-C-00010285.0001001 / 15 MAY 23
Applicable to: ALL

TOO STEEP PATH

A descent segment is called “too steep path” when the FMS predicts that the descent segment between two constraint waypoints is impossible to fly at the planned descent speed with half speedbrakes extended.



When this occurs, the MCDU does not display any prediction between the upper and the lower points of the too steep path. The message “TOO STEEP PATH AHEAD” appears on the MCDU scratchpad, and the marker "TOO STEEP PATH" appears on the flight plan.



NO PREDICTIONS BETWEEN THE UPPER AND LOWER POINTS

```
                                AI101→
  UB191          UTC        SPD/ALT
ABB              1238          /FL330
                                13
(T/D)            1239       .79/FL330
  BIG1A           TRK320°   21
FIR96            1242     310/*FL260
-------TOO STEEP PATH-------
  BIG1A
CLIFF            1246     293/*FL120
  DEST            UTC     DIST   EFOB
EGLL27R          1301     149     6.1
  TOO STEEP PATH AHEAD              ↑↓
```

When the aircraft reaches the beginning of the too steep path segment, the FMS computes again the VDEV. An Idle segment is built starting from the end of the too steep path segment. The VDEV computation uses the Idle segment.

GENERAL

Ident.: DSC-22_30-40-70-00022596.0001001 / 18 MAY 22
Applicable to: ALL

V/S and FPA are selected vertical modes. They are the basic modes of vertical guidance.
V/S / FPA acquires and holds the vertical speed or the flight path angle, that is displayed in the V/S / FPA window of the FCU.
When V/S / FPA engages following a reversion, the V/S / FPA target synchronizes on the current V/S / FPA of the aircraft, or the preselected V/S / FPA that is displayed in the V/S / FPA window of the FCU.

ENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-70-A-00022597.0001001 / 04 MAY 23

V/S / FPA engages, when one of the following occurs:

- The flight crew pushes or pulls the V/S / FPA knob

L2 V/S / FPA will not engage if LAND is engaged, or SRS GA is engaged below 100 ft RA.

L1
- The APs and FDs are disengaged, and the flight crew engages the FDs or the AP HDG/TRACK also engages.
- The aircraft is airborne for at least 5 s, with no other vertical mode engaged.

V/S / FPA engages, in accordance with the HDG-V/S / TRK-FPA selection.

Ident.: DSC-22_30-40-70-A-00025154.0001001 / 18 MAY 22

REVERSIONS TO V/S / FPA

A vertical mode reverts to V/S / FPA, when one of the following occurs:

- OP DES, or DES is engaged and the FCU selected altitude is set above the aircraft altitude
- OP CLB, or CLB is engaged and the FCU selected altitude is set below the aircraft altitude
- DES is engaged and one of the following mode disengages: NAV, LOC*, LOC, F-LOC* ◁ , F-LOC ◁ , LOC B/C*, LOC B/C
- FINAL APP is engaged and NAV disengages

L2
- The vertical flight plan is lost, when one of the following modes is engaged: DES, FINAL APP

L1
- G/S* or G/S is engaged, and LOC*or LOC disengages
- F-G/S* ◁ or F-G/S ◁ is engaged, and F-LOC* ◁ or F-LOC ◁ disengages
- The flight crew presses the LOC pb, or the APPR pb, when G/S*, G/S, F-G/S* ◁ or F-G/S ◁ is engaged

- ALT* is engaged, and the flight crew modifies the FCU selected altitude
- L2 The flight crew changes the approach, when one of the following vertical approach mode is engaged:
  - FINAL APP is engaged
  - G/S* or G/S is engaged, and the aircraft is below 700 ft RA
  - F-G/S* ◁ or F-G/S ◁ is engaged.

L1 Note: *The aircraft targets the preselected V/S / FPA that is displayed on the V/S / FPA window of the FCU instead of the current value, if:*
- *The reversion occurs within 45 s after the preselection of the V/S / FPA value, and*
- *The V/S / FPA mode was not engaged by the flight crew.*

As a consequence, this new V/S / FPA value may lead the aircraft to a path opposite to the current one, or to a steeper one.

The AP/FD TCAS ◁ mode can also disengaged to revert to V/S mode.

Ident.: DSC-22_30-40-70-A-00025228.0001001 / 18 MAY 22

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-70-B-00025090.0001001 / 18 MAY 22

MANUAL DISENGAGEMENT

V/S / FPA disengages manually, when one of the following occurs:
- The flight crew pulls the ALT knob: OP CLB or OP DES engages
- The flight crew pushes the ALT knob
  - NAV engages.
  - The FCU selected altitude is above the aircraft altitude
  - The FMS flight phase is neither descent, nor approach
  - The vertical flight plan is valid.

  CLB engages

- The flight crew pushes the ALT knob
  - One of the following modes is engaged: NAV, LOC*, LOC, LOC B/C*, LOC B/C, F-LOC* ◁ , F-LOC ◁
  - The FCU selected altitude is below the aircraft altitude
  - The FMS flight phase is cruise, or descent
  - The vertical flight plan is valid.

  DES engages
- The flight crew pushes the ALT pb: ALT engages
- The flight crew engages go-around: SRS GA engages.

Ident.: DSC-22_30-40-70-B-00025149.0001001 / 18 MAY 22

AUTOMATIC DISENGAGEMENT

V/S / FPA disengages automatically, when one of the following occurs:

- The aircraft reaches the capture zone of the FCU selected altitude: ALT* engages
- ALT CRZ is armed, and the aircraft reaches the capture zone of the cruise altitude: ALT CRZ* engages

Ident.: DSC-22_30-40-70-B-00025150.0001001 / 18 MAY 22

- The aircraft reaches the G/S capture zone when:
  - LOC* or LOC is engaged
  - G/S is armed

  G/S* engages

Ident.: DSC-22_30-40-70-B-00025151.0001001 / 18 MAY 22

- The aircraft reaches the F-G/S ◁ capture zone when:
  - LOC*, LOC, F-LOC* ◁ or F-LOC ◁ is engaged
  - F-G/S ◁ is armed

  F-G/S* ◁ engages

Ident.: DSC-22_30-40-70-B-00022602.0001001 / 18 MAY 22

- The aircraft reaches the FINAL capture zone, when:
  - APP NAV is engaged
  - FINAL is armed

  FINAL APP engages

Ident.: DSC-22_30-40-70-B-00025153.0001001 / 18 MAY 22

- AP/FD TCAS ◁ mode engages.

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General

GENERAL

Ident.: DSC-22_30-40-80-00-A-00025812.0001001 / 03 MAY 23
Applicable to: ALL

Flight guidance can perform different types of approaches. *Refer to PRO-NOR-SOP-18-A Cross-Reference Table*.

Ident.: DSC-22_30-40-80-00-A-00025813.0001001 / 18 MAY 22
Applicable to: ALL

APPROACH SELECTION

STANDARD SELECTION

The flight crew selects the approach via the ARRIVAL page.

Ident.: DSC-22_30-40-80-00-A-00025814.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

MANUAL TUNING ON THE FMS

If the flight crew manually-tunes an LS approach on the RADIO NAV page, the flight guidance system will disregard the manual tuning and guide the aircraft on the approach selected on the ARRIVAL page.

L2 If the approach selected on the ARRIVAL page and the LS approach set on the RADIO NAV page are different:
- The manually-tuned LS approach on the RADIO NAV page is disregarded, and the CHECK APPR SEL message is displayed on the FMA, and on the MCDU Scratchpad.
- The aircraft will fly the approach selected on the ARRIVAL page.

Ident.: DSC-22_30-40-80-00-A-00025814.0005001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

MANUAL TUNING ON THE FMS

If the flight crew manually-tunes an LS approach on the RADIO NAV page, the flight guidance system will guide the aircraft on the manually-tuned approach.

L2 If the approach selected on the ARRIVAL page and the LS approach set on the RADIO NAV page are different:
- The approach selected on the ARRIVAL page is disregarded, and the CHECK APPR SEL message is displayed on the FMA, and on the MCDU Scratchpad
- The aircraft will fly the manually-tuned LS approach on the RADIO NAV page.

Ident.: DSC-22_30-40-80-00-A-00025815.0001001 / 18 MAY 22
Applicable to: ALL

MANUAL TUNING ON THE RMP (BACKUP)

If all the FMCs are fault, the flight crew selects the NAV key on the RMP 1 or 2, in order to manually-tune the frequency, or select a GLS ◁ approach, or an ILS approach.

Ident.: DSC-22_30-40-80-00-A-00025816.0001001 / 18 MAY 22
Applicable to: ALL

SELECTION IN THE MMRS

When an approach is selected on the ARRIVAL page, or manually-tuned on RADIO NAV page, or via the RMP, the approach frequency and course are sent to both MMRs.
In case of discrepancy between both MMRs the NAV LS TUNING DISAGREE alert triggers.

Note: *Below 700 ft RA, when an approach mode is engaged, the flight guidance system freezes the LS selection in the MMR. As a result, the MMR does not take into account any change of the LS selection.*

ILS/GLS (IF INSTALLED)/SLS (IF INSTALLED) GUIDANCE MODE

Applicable to: ALL

Ident.: DSC-22_30-40-80-00-B-00025818.0001001 / 18 MAY 22

ILS GUIDANCE MODE

An ILS guidance mode uses the Localizer and Glideslope signals from localizer antennas and a glideslope antenna on ground.

L2 The MMR computes the ILS lateral and vertical angular deviations.

L1 The ILS lateral deviation is referred to as the LOC deviation, and the ILS vertical deviation is referred to as the G/S deviation.
The FG uses the LOC and G/S deviations in order to fly the aircraft along the LOC and G/S beams.

APPROACH MODES

The ILS guidance modes are:

	Lateral Guidance	Vertical Guidance
Above 400 ft RA	LOC*: Capture of the LOC beam LOC: Track of the LOC beam	G/S*: Capture of the G/S beam G/S: Track of the G/S beam
Below 400 ft RA, and until end of roll out	LAND: Track of LOC and G/S beams FLARE: Alignment of the yaw axis on the runway centerline, and flare on the pitch axis ROLL OUT: Track of the runway centerline, and nose down	

APPROACH AND LANDING CAPABILITY

In accordance with the approach minima and the landing technique, minimum approach and landing capabilities are required.

Ident.: DSC-22_30-40-80-00-B-00025819.0001001 / 18 MAY 22

GLS ⊲ GUIDANCE MODE

The GLS guidance mode uses the GNSS position with a correction and integrity signal from a ground station also known as GBAS.

L2 The MMR computes the GLS deviations.

L1 The GLS lateral deviation is referred to as the LOC deviation, and the GLS vertical deviation is referred to as the G/S deviation.

Note: *The computed lateral and vertical deviations are available up to 20 NM from the runway threshold.*

The FG uses the LOC and G/S deviations in order to fly the aircraft along the LOC and G/S approach path, like ILS.

APPROACH MODES

The GLS guidance modes are:

	Lateral Guidance	Vertical Guidance
Above 400 ft RA	LOC*: Capture of the LOC beam LOC: Track of the LOC beam	G/S*: Capture of the G/S beam G/S: Track of the G/S beam
Below 400 ft RA, and until end of roll out	LAND: Track of LOC and G/S beams FLARE: Alignment of the yaw axis on the runway centerline, and flare on the pitch axis ROLL OUT: Track of the runway centerline, and nose down	

APPROACH AND LANDING CAPABILITY

In accordance with the approach minima and the landing technique, minimum approach and landing capabilities are required.

Ident.: DSC-22_30-40-80-00-B-00025820.0001001 / 18 MAY 22

SLS ⊲ GUIDANCE MODE

The SLS guidance mode uses the GNSS position with a correction and integrity signal from satellite constellations also known as SBAS.
The SLS guidance mode enables the flight crew to fly an RNAV (GNSS) straight-in approach with LPV minima, or LP minima with the LOC guidance mode only.

L2 The MMR computes the SLS deviations.

L1 The SLS lateral deviation is referred to as the LOC deviation, and the SLS vertical deviation is referred to as the G/S deviation.

The FG uses the LOC and G/S deviations in order to fly the aircraft along the LOC and G/S approach path, like ILS.

APPROACH MODES

The SLS guidance modes are:

	Lateral Guidance	Vertical Guidance
Above 400 ft RA	LOC*: Capture of the LOC beam LOC: Track of the LOC beam	G/S*: Capture of the G/S beam G/S: Track of the G/S beam
Below 400 ft RA	LAND: Track of LOC and G/S beams FLARE: Alignment of the yaw axis on the runway centerline, and flare on the pitch axis ROLL OUT: Track of the runway centerline, and nose down	

APPROACH AND LANDING CAPABILITY

In accordance with the approach minima and the landing technique, minimum approach and landing capabilities are required.

FINAL APP GUIDANCE MODE

Ident.: DSC-22_30-40-80-00-00025825.0001001 / 18 MAY 22
Applicable to: ALL

APPROACH WITH FINAL APP GUIDANCE

The flight crew can use the FINAL APP mode in order to guide the aircraft laterally and vertically down to the Minimum, along the final descent profile computed by the FMS.

APPROACH MODES

The approach modes are:

Lateral Guidance	Vertical Guidance
APP NAV	FINAL
FINAL APP	

LOC Mode

GENERAL

Ident.: DSC-22_30-40-80-10-00020394.0001001 / 18 MAY 22
Applicable to: ALL

The LOC* mode captures the localizer beam of the ILS/GLS ◁ /SLS ◁ .
The LOC mode tracks the localizer beam of the ILS/GLS ◁ /SLS ◁ .

LOC ARMING CONDITIONS

Ident.: DSC-22_30-40-80-10-00020395.0001001 / 04 MAY 23
Applicable to: ALL

LOC arms, when the flight crew presses the APPR pb, or the LOC pb, and one of the following conditions is applicable:

- An ILS, GLS ◁ , or RNAV(GNSS) with LPV(LP) minima (with SLS ◁ option) approach is set on the ARRIVAL page
- An ILS, GLS ◁ is manually-tuned on the RADIO NAV page

L2 *Note:* *If the flight crew sets a different ILS approach on the ARRIVAL page:*
- *The aircraft will fly the manually-tuned LS*
- *The MCDU displays the RWY/LS MISMATCH message.*

- At least one LS receiver must be operative. If both receivers are operative, the LS parameters must be the same in both LS receivers

L1 - A LOC only approach is set on the ARRIVAL page

L2 *Note:* *On aircraft equipped with the FLS ◁ function , the flight crew can also deselect the G/S of an ILS approach on the RADIO NAV page*

L1 - The ILS frequency / GLS ◁ channel and course are manually-tuned on the RMP.

L2 LOC can only arm when all of the following are applicable:
- HDG/TRACK or NAV is engaged, and
- The vertical mode is not SRS TO, nor SRS GA, and
- The aircraft is above 400 ft RA.

LOC DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-10-00020396.0001001 / 18 MAY 22
Applicable to: ALL

LOC disarms, when LOC* engages.

L2 LOC also disarms, when one of the following occurs:
- G/S or F-G/S ◁✱ is armed, and the flight crew presses the APPR pb, or
- Neither G/S, nor F-G/S ◁✱ is armed, and the flight crew presses the LOC pb, or
- NAV arms, or
- The flight crew engages go-around, or
- The flight crew modifies the approach selection, or

  Note: *The flight crew can change the approach selection, only when the aircraft is above 700 ft RA.*

- The LS parameters are different in both LS receivers.

LOC* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-10-A-00020347.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

LOC* engages, when LOC is armed, and the aircraft reaches the capture zone.

Ident.: DSC-22_30-40-80-10-A-00020347.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

LOC* engages, when LOC is armed, and the aircraft reaches the capture zone, or the pre-capture zone of the LOC beam.

PRE-CAPTURE ZONE OF THE LOC BEAM (ENHANCED LOC CAPTURE FUNCTION)

The pre-capture zone of the LOC beam is introduced through the Enhanced LOC Capture function. With the enhanced LOC Capture function, the aircraft uses the aircraft position and the FMS trajectory to provide guidance in order to pre-capture the LOC beam.

The pre-capture of the LOC beam allows to:
- Enhance the performance of the LOC capture
- Avoid a false capture
- Capture the LOC beam without overshoot.

The pre-capture zone is available, when all of the following conditions are applicable:
- The LOC deviation is more than 2.3 dots, and
- The FMS is in GPS PRIMARY ◁✱ , and
- L2 The difference between the track and the LOC course is between 25 ° and 115 °, and
- The roll order is such that LOC* will capture the LOC beam with a single turn.

L1 *Note:* *On the PFD and on the ND, the flight crew observes movement of the LOC deviation toward the center of the scale, only when the LOC deviation is less than 2 dots. This occurs when the aircraft is in the capture zone.*

Ident.: DSC-22_30-40-80-10-A-00020346.0001001 / 18 MAY 22
Applicable to: ALL

CAPTURE ZONE OF THE LOC BEAM

The aircraft reaches the capture zone of the LOC beam, when one of the following occurs:

- The LOC deviation is less than 2.3 dots, and:
  - L2 The difference between the track and the LOC course is between 25 ° and 115 ° , and
  - The roll order is such that LOC* will capture the LOC beam with a single turn.
- L1 The LOC deviation is less than 1.3 dot, and the difference between the track and the LOC course is less than 15 °.

L2 If the approach is an ILS, the LOC* mode uses the ILS LOC deviation to perform the capture.

L1 Note: *During the LOC capture, the LOC deviation starts to move toward the center of the LS scale, on the PFD and ND, when the LOC deviation is less than 2 dots.*

Ident.: DSC-22_30-40-80-10-A-00021659.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

LOC CONVERGENCE FUNCTION

The purpose of the LOC convergence function is to help to intercept and capture the LOC axis.

The flight guidance intercepts the LOC axis with a 20 ° track convergence, when all the following conditions are applicable:

- The LOC mode is armed, and
- The NAV mode is engaged, and
- The aircraft is within 20 NM of the destination runway, and
- The difference between the aircraft track and the runway course is less than 20 °.

LOC* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-10-B-00020390.0001001 / 04 MAY 23

LOC* disengages, when another lateral mode engages.

L2 LOC* disengages, when one of the following occurs:

- The aircraft becomes established on the LOC beam: LOC engages, or
- The flight crew presses the LOC pb, and there is no vertical managed mode of approach armed or engaged: HDG/TRACK engages, or
- The flight crew pulls the HDG/TRK knob: HDG/TRACK engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO: NAV engages, or
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-10-B-00020392.0001001 / 04 MAY 23

REVERSIONS

LOC* reverts to HDG/TRACK, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
  - G/S is armed, or
  - G/S* is engaged, or
  - G/S is engaged, or
  - F-G/S ◁ is armed, or
  - F-G/S* ◁ is engaged, or
  - F-G/S ◁ is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
- L2 The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.

L1 When LOC* reverts to HDG/TRACK, the vertical mode also reverts to V/S / FPA.

Ident.: DSC-22_30-40-80-10-B-00020393.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

LOC ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-10-00020397.0001001 / 18 MAY 22
Applicable to: ALL

LOC engages, when LOC* is engaged, and the aircraft becomes established on the LOC beam.

LOC DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-10-C-00020398.0001001 / 04 MAY 23

LOC disengages, when another lateral mode engages.

L2 LOC disengages, when one of the following occurs:

- G/S is engaged, and LAND engages, or
- The flight crew presses the LOC pb, and there is no vertical managed mode of approach, armed or engaged, HDG/TRACK engages, or.

- The flight crew pulls the HDG/TRK knob, HDG/TRACK engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO, NAV engages, or
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-10-C-00020399.0001001 / 04 MAY 23

REVERSIONS

LOC reverts to HDG/TRACK, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
  - G/S is armed, or
  - G/S* is engaged, or
  - G/S is engaged, or
  - F-G/S ◁ is armed, or
  - F-G/S* ◁ is engaged, or
  - F-G/S ◁ is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
- L2 The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.

L1 When LOC reverts to HDG/TRACK, the vertical mode also reverts to V/S / FPA.

Ident.: DSC-22_30-40-80-10-C-00020400.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

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G/S Mode

GENERAL

Ident.: DSC-22_30-40-80-20-00020435.0001001 / 18 MAY 22
Applicable to: ALL

The G/S* mode captures the glide slope beam of the ILS / GLS ◁ / SLS ◁ .
The G/S mode tracks the glide slope beam of the ILS / GLS ◁ / SLS ◁ .

Note: *In accordance with the below G/S and G/S* engagement conditions, G/S or G/S* modes may engage at altitudes that are above the radio altimeter validity. In that case, the landing capability displayed on the FMA (CAT1) reflects the lack of radio altimeter validity until the radio altimeter becomes active. If the radio altimeters fail, or if the FGs don't receive any radio altimeter data, then LOC, G/S and both AP/FDs disengage and FDs re-engage on basic modes.*

G/S ARMING CONDITIONS

Ident.: DSC-22_30-40-80-20-00020436.0001001 / 18 MAY 22
Applicable to: ALL

G/S arms, when the flight crew presses the APPR pb, and one of the following conditions is applicable:

- An ILS, GLS ◁ , or RNAV(GNSS) with LPV minima (with SLS ◁ option) approach is set on the ARRIVAL page
- An ILS, or GLS ◁ approach is manually tuned on the RADIO NAV page

Note: *If the flight crew sets a different LS approach on the ARRIVAL page:*
- *The aircraft will fly the manually-tuned LS*
- *The MCDU displays the RWY/LS MISMATCH message.*

L2 - At least one LS receiver must be operative. If both receivers are operative, the LS parameters must be the same in both LS receivers
L1 - The ILS frequency / GLS ◁ channel and course are manually-tuned on the RMP

L2 G/S can only arm when all of the following are applicable:
- The mode is not SRS, RWY, RWY TRK, GA TRK
- The aircraft is above 400 ft RA.

G/S DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-20-00020437.0001001 / 18 MAY 22
Applicable to: ALL

G/S disarms, when G/S* engages.

L2 G/S also disarms, when one of the following occurs:

- The flight crew presses the APPR pb, or the LOC pb, or
- LOC disarms, or
- LOC*, or LOC is lost, or
- The AP/FD TCAS ◁ mode engages upon a RA, or
- The flight crew modifies the approach selection, or

  Note: *The flight crew can change the approach selection, only when the aircraft is above 700 ft RA.*

- The flight crew performs a go around, SRS GA and GA TRK engage.

G/S* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-20-00020403.0001001 / 04 MAY 23
Applicable to: ALL

G/S* engages when the aircraft reaches the capture zone of the G/S beam, and all of the following conditions are applicable:

- G/S is armed, and
- LOC* or LOC is engaged.

L2 The aircraft reaches the capture zone of the G/S beam, when one of the following occurs:

- Passage far from the G/S beam:
  - The G/S deviation is less than 2 dots, and:
  - The pitch order is such that G/S* will capture the G/S beam with a single maneuver.
- Passage near the G/S beam: The G/S deviation is less than a threshold depending on the radio altitude.
  This threshold is between 0.1 and 1/3 dot.

G/S* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-20-A-00020404.0001001 / 18 MAY 22

G/S* disengages, when another vertical mode engages.

L2 G/S* disengages, when one of the following occurs:

- The aircraft becomes established on the G/S beam: G/S engages
  G/S* is engaged for more than 15 s, and the G/S deviation becomes less than 1/3 dot.
- The flight crew pushes or pulls the V/S / FPA knob: V/S / FPA engages
- The flight crew pulls the ALT knob: OP CLB or OP DES engages
- The flight crew presses the ALT knob: ALT engages

- The AP/FD TCAS mode engages upon a RA (if LOC is engaged, LOC remains engaged, APPR pb comes off and the LOC pb comes on)
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-20-A-00020432.0001001 / 04 MAY 23

REVERSIONS

G/S* reverts to V/S / FPA, when one of the following occurs:

- LOC disengages: The lateral mode also reverts to HDG/TRACK
- The flight crew presses the APPR pb: The lateral mode also reverts to HDG/TRACK
- The flight crew pulls the HDG/TRK knob: The lateral mode also reverts to HDG/TRACK
- The flight crew presses the LOC pb
- L2 The aircraft is above 700 ft RA, and the flight crew changes the approach on the FMS ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page. The lateral mode also reverts to HDG/TRACK
- The FG detects a difference between both MMRs.

Ident.: DSC-22_30-40-80-20-A-00020433.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

G/S ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-20-00021652.0001001 / 18 MAY 22
Applicable to: ALL

G/S engages, when G/S* is engaged, and the aircraft becomes established on the G/S beam.

G/S DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-20-B-00020401.0001001 / 04 MAY 23

G/S disengages, when another vertical mode engages.

L2 G/S disengages, when one of the following occurs:

- LAND engages at 400 ft RA, if the approach and landing capability is CAT1, CAT2 or CAT3, or
- The flight crew pushes or pulls the V/S / FPA knob, V/S / FPA engages, or
- The flight crew pulls the ALT knob, OP CLB or OP DES engages, or
- The flight crew presses the ALT knob, ALT engages, or

- The AP/FD TCAS mode engages upon a RA (if LOC is engaged, LOC remains engaged, APPR pb comes off and the LOC pb comes on), or
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-20-B-00020402.0001001 / 04 MAY 23

REVERSIONS

G/S reverts to V/S / FPA, when one of the following occurs:

- LOC disengages: The lateral mode also reverts to HDG/TRACK
- The flight crew presses the APPR pb: The lateral mode also reverts to HDG/TRACK
- The flight crew presses the LOC pb
- The flight crew pulls the HDG/TRK knob: The lateral mode also reverts to HDG/TRACK
- L2 The aircraft is above 700 ft RA, and the flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page. The lateral mode also reverts to HDG/TRACK
- The FG detects a difference between both MMRs.

Ident.: DSC-22_30-40-80-20-B-00020345.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

LAND Mode

GENERAL

Ident.: DSC-22_30-40-80-30-00021698.0001001 / 18 MAY 22
Applicable to: ALL

The LAND mode is a common vertical and lateral mode.
The LAND mode tracks the LOC and G/S beams from 400 ft RA to approximately 60 ft RA.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-30-00021699.0001001 / 18 MAY 22
Applicable to: ALL

LAND automatically engages, when all the following conditions are applicable:
- The approach and landing capability is CAT1, CAT2 or CAT3, and
- LOC and G/S are engaged, and
- The aircraft is below 400 ft RA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-30-00021702.0001001 / 18 MAY 22
Applicable to: ALL

LAND automatically disengages, when the aircraft approximately reaches 60 ft RA: FLARE engages.
When LAND is engaged, no action on the FCU can disengage LAND.
The flight crew can only disengage LAND by performing a go-around.

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FLARE Mode

GENERAL

Ident.: DSC-22_30-40-80-40-00021792.0001001 / 04 MAY 23
Applicable to: ALL

The FLARE mode is a common lateral and vertical mode:

- Lateral guidance: The FLARE mode reduces the sideslip angle, such that the aircraft will be aligned with the runway centerline at the aircraft touchdown
- Vertical guidance: The FLARE mode decreases the descent rate, in order to ensure a comfortable transition between the glide tracking, and the aircraft touchdown.
- If the A/THR is active, the thrust is automatically reduced to IDLE.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-40-00021793.0001001 / 18 MAY 22
Applicable to: ALL

FLARE engages, if all the following conditions are applicable:

- The aircraft approximately reaches 60 ft RA
- The approach that the flight crew selects is either an ILS approach, a GLS ◁ approach, or an RNAV(GNSS) approach with LPV minima (with SLS ◁).

L2 FLARE engages only if the following conditions are applicable:

- The slats/flaps are extended, or the landing gears are extended
- One valid RA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-40-00021794.0001001 / 18 MAY 22
Applicable to: ALL

FLARE automatically disengages, when the aircraft touches down: ROLL OUT engages.
The flight crew can only disengage FLARE by performing a go-around.

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ROLL OUT Mode

GENERAL

Ident.: DSC-22_30-40-80-50-00021795.0001001 / 18 MAY 22
Applicable to: ALL

The ROLL OUT mode is a common lateral and vertical mode:
- Lateral guidance: the ROLL OUT mode guides the aircraft along the runway centerline
- Vertical guidance: The ROLL OUT mode lands the nose landing gear.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-50-00021796.0001001 / 18 MAY 22
Applicable to: ALL

The FLARE mode changes to the ROLL OUT mode when the aircraft touches down.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-50-00021797.0001001 / 18 MAY 22
Applicable to: ALL

ROLL OUT disengages, when one of the following occurs:
- The aircraft exits the runway, or

L2 Note: *When the difference between the aircraft track and the runway track is more than 20°, the ROLL OUT disengages due to the APs and FDs disengagement.*

L1 - The flight crew engages a go-around.

Intentionally left blank

LOC B/C Mode

GENERAL

Ident.: DSC-22_30-40-80-80-00021878.0001001 / 18 MAY 22
Applicable to: ALL

The LOC B/C* mode captures the localizer back beam of the ILS.
The LOC B/C mode tracks the localizer back course beam of the ILS.

LOC B/C ARMING CONDITIONS

Ident.: DSC-22_30-40-80-80-00021879.0001001 / 04 MAY 23
Applicable to: ALL

L2 LOC B/C can only arm when all of the following are applicable:
- At least one LS receiver must be operative. If both receivers are operative, the LS parameters must be the same in both LS receivers.
- HDG/TRACK or NAV is engaged, and
- The aircraft is above 400 ft RA.

L1 LOC B/C arms, when:
- The flight crew selected a LOC B/C approach on the ARRIVAL page, and
- The flight crew presses the LOC pb.

LOC B/C DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-80-00021880.0001001 / 18 MAY 22
Applicable to: ALL

LOC B/C disarms, when LOC B/C* engages.

L2 LOC B/C also disarms, when one of the following occurs:
- F-G/S ◁ is armed, and the flight crew presses the APPR pb, or
- F-G/S ◁ is not armed, and the flight crew presses the LOC pb, or
- NAV arms, or
- The flight crew engages go-around, or
- The flight crew modifies the approach selection, or
- The LS parameters are different in both LS receivers.

LOC B/C* ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-80-00021883.0001001 / 18 MAY 22
Applicable to: ALL

LOC B/C* engages, when LOC B/C is armed, and the aircraft reaches the capture zone of the LOC B/C beam.

CAPTURE ZONE OF THE LOC BEAM

The aircraft reaches the capture zone of the LOC B/C beam, when one of the following occurs:

- The LOC B/C deviation is less than 2.3 dots, and

L2
  - The difference between the track and the LOC B/C course is between 25 ° and 115 ° , and
  - The roll order is such that LOC B/C* will capture the LOC B/C beam with a single turn.

L1
- The LOC B/C deviation is less than 1.3 dot, and the difference between the track and the LOC B/C course is less than 15 °.

LOC B/C* DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-80-A-00021884.0001001 / 04 MAY 23

LOC B/C* disengages, when another lateral mode engages.

L2 LOC B/C* disengages, when one of the following occurs:

- The aircraft becomes established on the LOC B/C beam: LOC B/C engages, or
- The flight crew presses the LOC pb, and there is no vertical managed mode of approach armed or engaged: HDG/TRACK engages, or

  Note: *If a vertical managed mode of approach was previously engaged: LOC B/C* remains engaged, and a vertical mode reversion occurs.*

- The flight crew pulls the HDG/TRK knob: HDG/TRACK engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO: NAV engages, or
- The flight crew performs a go-around: SRS GA and GA TRK engage.

Ident.: DSC-22_30-40-80-80-A-00021885.0001001 / 04 MAY 23

REVERSIONS

LOC B/C* reverts to HDG/TRACK, when one of the following occurs:

- The flight crew presses the APPR pb, and one of the following conditions is applicable:
  - F-G/S is armed, or
  - F-G/S* is engaged, or
  - F-G/S is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
- L2 The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.

L1 When LOC B/C* reverts to HDG/TRACK, the vertical mode also reverts to V/S/FPA.

Ident.: DSC-22_30-40-80-80-A-00025786.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

LOC B/C ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-80-00021887.0001001 / 18 MAY 22
Applicable to: ALL

LOC B/C engages, when LOC B/C* is engaged, and the aircraft becomes established on the LOC B/C beam.

LOC B/C DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-80-80-B-00021888.0001001 / 04 MAY 23

LOC B/C disengages, when another lateral mode engages.

L2 LOC B/C disengages, when one of the following occurs:

- The flight crew presses the LOC pb, and there is no vertical managed mode of approach armed or engaged: HDG/TRACK engages, or
- The flight crew pulls the HDG/TRK knob: HDG/TRACK engages, or
- The aircraft is above 700 ft RA, and the flight crew inserts a DIRECT TO: NAV engages, or
- The flight crew performs a go-around: SRS GA and GA TRK engage.

Ident.: DSC-22_30-40-80-80-B-00021889.0001001 / 04 MAY 23

REVERSIONS

LOC B/C reverts to HDG/TRACK, when one of the following occurs:

- The flight crew presses the APPR pb , and one of the following conditions is applicable:
  - F-G/S is armed, or
  - F-G/S* is engaged, or
  - F-G/S is engaged.
- The flight crew inserts a DIRECT TO RADIAL IN or DIRECT TO RADIAL OUT in the active flight plan
- L2 The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page
- The FG detects a difference between both MMRs.

L1 When LOC B/C reverts to HDG/TRACK, the vertical mode also reverts to V/S/FPA.

Ident.: DSC-22_30-40-80-80-B-00025787.0001001 / 18 MAY 22

When the reversion occurs:

- The triple click sounds
- The new guidance mode is boxed for 10s
- The FD bars flash for 10s.

FINAL APP Mode

GENERAL

Ident.: DSC-22_30-40-80-90-00019653.0001001 / 18 MAY 22
Applicable to: ALL

FINAL APP is a lateral and vertical managed guidance approach mode that guides the aircraft during the final approach.

The FINAL APP mode includes the following modes:
- APP NAV mode for lateral guidance
- FINAL mode for vertical guidance.

APP NAV AND FINAL ARMING CONDITIONS

Ident.: DSC-22_30-40-80-90-00022031.0001001 / 18 MAY 22
Applicable to: ALL

APP NAV and FINAL modes arms, when all the following conditions are applicable:
- The flight crew presses the APPR pb
- The active flight plan is valid (lateral and vertical profile)
- The approach selected in the ARRIVAL page is compatible with the FINAL APP function (*Refer to PRO-NOR-SOP-18-A Cross-Reference Table*).

Note: *If an RNAV visual approach is selected, the flight crew must deselect the FLS mode via the PERF APPR page.*

APP NAV AND FINAL DISARMING CONDITIONS

Ident.: DSC-22_30-40-80-90-00022032.0001001 / 18 MAY 22
Applicable to: ALL

APP NAV and FINAL modes disarms, when one of the following conditions occurs:
- The flight crew presses the APPR pb: NAV remains armed or NAV remains engaged
- The flight crew presses the LOC pb arming LOC mode
- NAV disarms, or NAV engages
- The flight crew performs a go around
- The flight crew modifies the approach selection (for some FG standards)
- The FMS vertical profile is lost
- AP/FD TCAS mode engages. In this case, FINAL disengages and NAV remains engaged.

APP NAV ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-00022036.0001001 / 04 MAY 23
Applicable to: ALL

APP NAV and NAV modes engage under the same conditions:
- If NAV is engaged, APP NAV engages immediately
- If HDG/TRACK is engaged, APP NAV engages when the intercept conditions are met (the aircraft track line must intercept the flight plan active leg).

APP NAV DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-00022045.0001001 / 18 MAY 22
Applicable to: ALL

APP NAV and NAV modes disengage under the same conditions (*Refer to DSC-22_30-40-30-20 Disengagement Conditions*).

FINAL APP ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-A-00025790.0003001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FINAL APP mode engages when all the following conditions are applicable:
- The aircraft is in the capture zone of the vertical FMS profile

L2 The vertical capture zone above and below the vertical FMS profile is defined as follow:
- Laterally: ±1.5 NM from the Final Descent Point.
- Vertically: +250 ft above the Final Descent Point.

Ident.: DSC-22_30-40-80-90-A-00025790.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

FINAL APP mode engages when all the following conditions are applicable:
- The aircraft is in the capture zone of the vertical FMS profile

L2 The vertical capture zone above and below the vertical FMS profile is defined as follow:
- Laterally: ±1.5 NM from the Final Descent Point
- Vertically: +150 ft above the Final Descent Point.

Ident.: DSC-22_30-40-80-90-A-00022037.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

- NAV or APP NAV is engaged
- FINAL is armed
- Predictions are available in FMS

- APPROACH phase is active, and the deceleration point has sequenced

  Note: *APPROACH phase may have to be manually activated on PERF APPR page if the approach starts at high altitude above aerodrome level (i.e. RNAV(RNP) approaches).*

- The aircraft intercepts a descending leg of the vertical flight path.

  Note: *If APPR pb is pressed earlier, FINAL APP mode may engage. As a consequence, resulting speed and altitude management in the FINAL APP may be inappropriate before FDP.*

A blue arrow is displayed on NDs to indicate where the FINAL APP engagement conditions are met and where the final descent will begin automatically.
If the same arrow is displayed in white, at least one engagement condition is not fulfilled, FINAL APP will not engage and the aircraft will not descend automatically.

Ident.: DSC-22_30-40-80-90-A-00022037.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

- NAV or APP NAV is engaged
- FINAL is armed
- Predictions are available in FMS
- APPROACH phase is active

  Note: *APPROACH phase may have to be manually activated on PERF APPR page if the approach starts at high altitude above aerodrome level (i.e. RNAV(RNP) approaches).*

- The aircraft intercepts a descending leg of the vertical flight path.

  Note: *If APPR pb is pressed earlier, FINAL APP mode may engage. As a consequence, resulting speed and altitude management in the FINAL APP may be inappropriate before FDP.*

A blue arrow is displayed on NDs to indicate where the FINAL APP engagement conditions are met and where the final descent will begin automatically.
If the same arrow is displayed in white, at least one engagement condition is not fulfilled, FINAL APP will not engage and the aircraft will not descend automatically.

Ident.: DSC-22_30-40-80-90-A-00022038.0001001 / 18 MAY 22
Applicable to: ALL

DEFINITION OF THE FINAL DESCENT POINT (ALSO CALLED VERTICAL INTERSECTION POINT "VIP" FOR RNAV (RNP) APPROACHES)

The FDP is the waypoint from which starts the FMS segment with coded FPA. For RNAV(RNP) approaches, this point may be indicated on the chart as FDP or "VIP".

This point is defined in the Navigation Database by:
- A constant vertical flight path beyond this point,
- A coded altitude constraint that may be "at" or "at or above" (e.g. +3 000 ft). This constraint is displayed on ND (in magenta), next to the corresponding waypoint, when the CSTR key is selected on the EFIS Control Panel. It is also shown on the F-PLN page at this WPT.

Note: *The FAF is the position from where the obstacle clearance is defined relative to an OCS. Obstacle clearance is only ensured if the aircraft is flying on the defined vertical flight path. Before the FAF, minimum altitudes are published with fixed MOC. The FDP is the point in the procedure at or before the FAF from which a constant vertical flight path is defined.*

FINAL APP DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-80-90-B-00022039.0001001 / 18 MAY 22
Applicable to: ALL

The FINAL APP mode disengages:
- When the AP/FD TCAS mode engages upon a RA, the FINAL mode disengages and the lateral NAV mode remains engaged. The APPR pb comes off

Ident.: DSC-22_30-40-80-90-B-00022040.0002001 / 18 MAY 22
Applicable to: ALL

- The flight crew pushes, or pulls out the V/S / FPA knob: V/S / FPA engages, NAV remains engaged

Ident.: DSC-22_30-40-80-90-B-00022041.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

- Automatically at minimum -50 ft, or 400 ft AGL, if the flight crew does not enter any minimum
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-90-B-00022041.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

- Automatically at MAP
- The flight crew performs a go-around.

Ident.: DSC-22_30-40-80-90-B-00022043.0001001 / 04 MAY 23
Applicable to: ALL

REVERSIONS

FINAL APP reverts to V/S / FPA, when one of the following occurs:
- NAV disengages: The lateral mode also reverts to HDG/TRACK, or
- If the flight crew pulls out the HDG/TRK knob: The lateral mode also reverts to HDG/TRACK, or

- The flight crew presses the APPR pb: The lateral mode remains engaged in NAV, or
- If the flight crew presses the LOC pb: The lateral mode also reverts to HDG-V/S and LOC arms if an ILS / GLS approach is selected, or
- The FMS flight phase is no longer cruise (CRZ), descent (DES) or approach (APPR), or
- L2 The flight crew changes the approach on the ARRIVAL page, the frequency, the identification, or the course of the LS station on the RADIO NAV page.
  The lateral mode also reverts to HDG/TRACK.

Ident.: DSC-22_30-40-80-90-B-00022044.0001001 / 18 MAY 22
Applicable to: ALL

When the reversion occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s
- The FD bars flash for 10 s.

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General

GENERAL

Ident.: DSC-22_30-40-90-10-00022079.0002001 / 05 MAR 19
Applicable to: LV-GKO, LV-GKP

Go-around combines SRS GA vertical mode, and GA TRK lateral mode.
SRS GA and GA TRK engage at the same time. They disengage at different moment.

At go-around engagement (i.e. SRS GA and GA TRK engage):
- The FMS flight phase becomes go-around
- If not previously engaged, the FDs automatically engage
- If FPD/FPV was previously displayed, it reverts to FD bars.

GENERAL

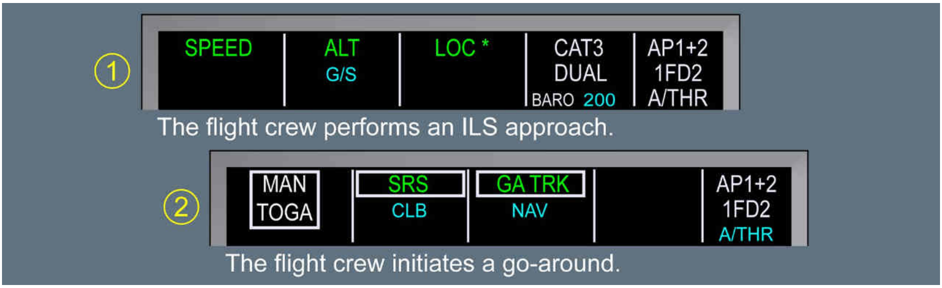
Ident.: DSC-22_30-40-90-10-00022079.0003001 / 04 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

When the flight crew initiates a go-around, the SRS GA vertical mode engages. In addition, one of the following occurs:

- If a lateral managed mode is engaged (except NAV mode), GA TRK engages, and NAV mode arms
  NAV automatically engages as soon as the aircraft reaches the capture zone of the flight plan active leg.

  Note: If a HDG/TRK was preset, NAV mode does not arm. GA TRK engages, until the flight crew pulls the HDG/TRK knob to follow the preset target.

Example: Go-around during an ILS approach

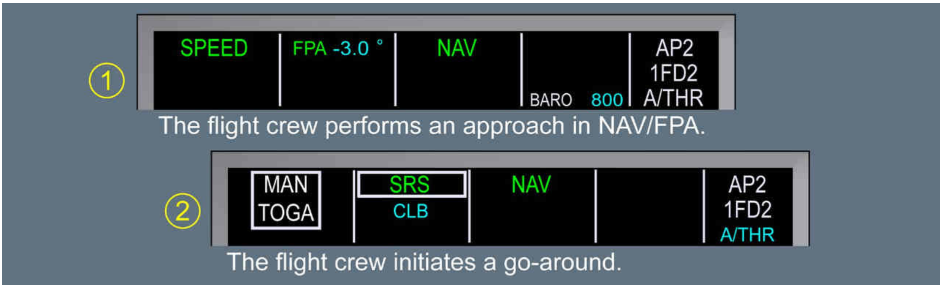

①
SPEED
ALT
G/S
LOC *
CAT3
DUAL
BARO 200
AP1+2
1FD2
A/THR
②
MAN
TOGA
SRS
CLB
GA TRK
NAV
AP1+2
1FD2
A/THR

The flight crew performs an ILS approach.

The flight crew initiates a go-around.

- If NAV mode is engaged, it remains engaged

Example: Go-around during an approach in NAV/FPA

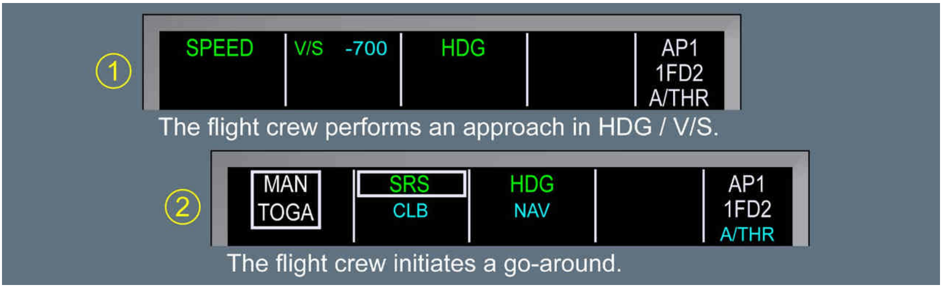

①
SPEED
FPA -3.0 °
NAV
BARO 800
AP2
1FD2
A/THR
②
MAN
TOGA
SRS
CLB
NAV
AP2
1FD2
A/THR

The flight crew performs an approach in NAV/FPA.

The flight crew initiates a go-around.

- If HDG/TRACK mode is engaged, it remains engaged, and NAV mode arms
  NAV automatically engages as soon as the aircraft reaches the capture zone of the flight plan active leg.

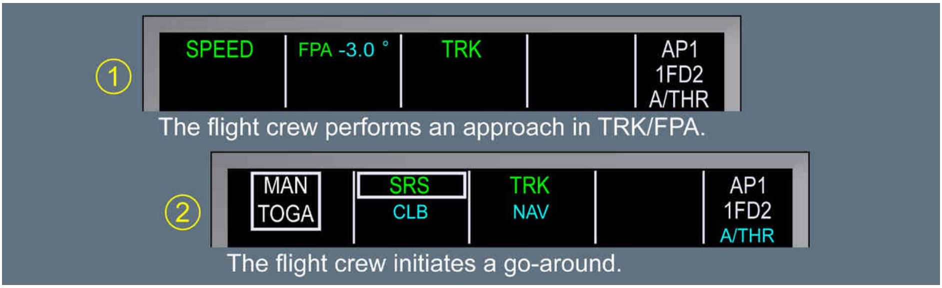
Example: Go-around during an approach in HDG / V/S


①
SPEED
V/S -700
HDG
AP1
1FD2
A/THR
②
MAN
TOGA
SRS
CLB
HDG
NAV
AP1
1FD2
A/THR

The flight crew performs an approach in HDG / V/S.

The flight crew initiates a go-around.

Example: Go-around during an approach in TRK/FPA


①
SPEED
FPA -3.0 °
TRK
AP1
1FD2
A/THR
②
MAN
TOGA
SRS
CLB
TRK
NAV
AP1
1FD2
A/THR

The flight crew performs an approach in TRK/FPA.

The flight crew initiates a go-around.

In addition, at go-around engagement:
- The FMS flight phase becomes go-around
- If not previously engaged, the FDs automatically engage
- If FPD/FPV was previously displayed, it reverts to FD bars.

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SRS GA Mode

GENERAL

Ident.: DSC-22_30-40-90-20-A-00022080.0002001 / 05 MAR 19
Applicable to: ALL

The SRS mode is a managed vertical mode. This mode is applicable during takeoff and go-around.
This chapter is only about the SRS mode during go-around, also referred to as SRS GA mode.
The FMA displays SRS, when the SRS GA mode engages.
The SRS GA controls the speed target via the elevators.

L2 The guidance law also includes:
- A flight path angle protection, that ensures a positive climb
- A pitch angle protection to reduce the aircraft nose-up (17.5 ° of maximum pitch attitude).
- A speed protection, that ensures the aircraft does not exceed VFE.

L1 The speed target is the memorized aircraft speed at SRS GA engagement or VAPP, whichever is higher.

L2 The higher limit of the target is the lowest value between:
- 25 kt above VLS (or 15 kt above VLS when one engine is inoperative)
- 5 kt below VMAX.

L1 *Note:* *At SRS GA engagement, the speed becomes managed.*

Ident.: DSC-22_30-40-90-20-A-00022359.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

When the SRS GA mode disengages, the speed target becomes Green Dot Speed.

Ident.: DSC-22_30-40-90-20-A-00022359.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

When the SRS GA mode disengages, the speed target becomes the smaller of Green Dot Speed or the speed constraints.

Note: *If the FMS flight phase is cruise, the SPD LIM or the SPD CSTR are still respected.*

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-20-00022081.0001001 / 04 MAY 23
Applicable to: ALL

SRS GA engages when all of the following conditions are applicable:
- The flight crew sets at least one thrust lever to the TOGA detent
- The flaps lever is at least in position 1
- The aircraft is airborne, or on ground for less than 30 s.

SRS GA mode can be engaged regardless of the vertical mode (except SRS TO).

DISENGAGEMENT CONDITIONS

Applicable to: ALL

Ident.: DSC-22_30-40-90-20-B-00022082.0001001 / 18 MAY 22

The SRS GA mode disengages when one of the following occur:
- At the go-around acceleration altitude (GA ACC ALT), or if ALT* or ALT CST* engages (above 400 ft RA)
- If the flight crew engages another vertical mode
- If the selected target altitude is above the aircraft altitude and the flight crew selects a speed: SRS GA reverts to OP CLB
- If the AP/FD TCAS ◁ mode engages upon a RA.

Note: *1. In Engine Out conditions, the SRS GA mode does not automatically disengage at EO ACC ALT.*
2. In dual AP configuration, disengagement of the go-around mode, on either axis, causes AP 2 to disconnect.

Ident.: DSC-22_30-40-90-20-B-00022380.0001001 / 18 MAY 22

REVERSIONS

When SRS GA reverts to OP CLB, the following occurs:
- The triple click sounds
- The new guidance mode is boxed for 10 s.

GA TRK Mode

GENERAL

Ident.: DSC-22_30-40-90-30-00022083.0001001 / 05 MAR 19
Applicable to: ALL

The GA TRK mode is a managed lateral mode that is applicable during go-around.
The GA TRK mode maintains the track of the aircraft, when the mode engages.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-30-00022084.0002001 / 04 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

GA TRK engages when all of the following conditions are applicable:
- The flight crew sets at least one thrust lever to the TOGA detent
- The slats or the flaps are extended
- The aircraft is airborne, or on ground for less than 30 s
- NAV, HDG, or TRACK is not engaged.

GA TRK simultaneously engages with SRS GA.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-30-00022084.0001001 / 05 MAR 19
Applicable to: LV-GKO, LV-GKP

GA TRK engages, when all of the following conditions are applicable:
- The flight crew sets at least one thrust lever to the TOGA detent
- The slats or the flaps are extended
- The aircraft is airborne, or on ground for less than 30 s.

GA TRK simultaneously engages with SRS GA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-90-30-00022085.0001001 / 05 MAR 19
Applicable to: ALL

GA TRK disengages when another lateral mode engages.

L2 GA TRK cannot be disengaged below 100 ft RA.

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GENERAL

Ident.: DSC-22_30-40-100-00022603.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The AP/FD TCAS mode is an AP/FD vertical mode, that provides vertical guidance in the case of a RA alert, generated by the TCAS.
When a TA is triggered, the AP/FD TCAS mode arms.

When an RA is triggered, the AP/FD TCAS mode engages to provide guidance in accordance with the RA order:
- The AP status does not change: Remains engaged or disengaged
- If not previously engaged, the FDs automatically engage.

When the "CLEAR OF CONFLICT" aural alert sounds, the AP/FD TCAS mode disengages.
The AP/FD provides guidance toward the latest target altitude set on the FCU.

AP/FD TCAS MODE AVAILABILITY

Ident.: DSC-22_30-40-100-00022604.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The AP/FD TCAS mode is available, when all of the following conditions are met:
- The aircraft is above 900 ft RA
- The TCAS is not failed (i.e. the ECAM did not trigger NAV TCAS FAULT)
- TCAS is in TA/RA mode
- At least one AP, or one FD is available
- The AP/FD TCAS mode is not failed (i.e. the ECAM did not trigger the AUTO FLT TCAS MODE FAULT alert)
- EGPWS, WINDSHEAR, or STALL warning is not triggered.

To arm or engage, the AP/FD TCAS mode must be available.

ARMING CONDITIONS

Ident.: DSC-22_30-40-100-00022908.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The AP/FD TCAS mode arms, when a TA alert is triggered.
The AP/FD TCAS mode arms, even if both APs, and both FDs are disengaged. In this case, the APs and FDs remain disengaged.

Note: *The arming of the AP/FD TCAS mode is inhibited when one of the following is applicable:*
- *The TA ONLY mode of the TCAS is selected, or*
- *The STANDBY mode of the TCAS is selected.*

DISARMING CONDITIONS

Ident.: DSC-22_30-40-100-00022928.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The AP/FD TCAS mode disarms, when one of the following occurs:
- The intruder becomes white on the ND, or
- The AP/FD TCAS mode engages upon a RA alert, or
- The TA ONLY mode of the TCAS is selected, or
- The STANDBY mode of the TCAS is selected, or
- The AP/FD TCAS mode fails (i.e the ECAM triggers the AUTO FLT TCAS MODE FAULT alert).

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-100-00022930.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The AP/FD TCAS mode engages, when a RA is triggered.
The AP/FD TCAS mode engages, even if both APs, and both FDs are disengaged. In this case, the FDs automatically engage.

Note:
- *When the AP/FD TCAS mode engages, the triple click audio indicator does not sound, and the FD pitch bar does not flash.*
- *The engagement of the AP/FD TCAS mode is inhibited when one of the following is applicable:*
  - *The TA ONLY mode of the TCAS is selected, or*
  - *The STANDBY mode of the TCAS is selected.*

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-40-100-00022931.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The AP/FD TCAS mode automatically disengages, when the "CLEAR OF CONFLICT" aural alert sounds.
Then the AP/FD engages in a vertical mode that leads the aircraft toward the target altitude set on the FCU.

The AP/FD TCAS mode also automatically disengages, if one of the following occurs:
- The TA ONLY mode of the TCAS is selected.
  The FMA then displays the TCAS RA INHIBITED message on Line 3 of the "Special Messages" column
- The STANDBY mode of the TCAS is selected.
  The FMA then displays the TCAS RA INHIBITED message on Line 3 of the "Special Messages" column

- The ECAM triggers the AP/FD AUTO FLT TCAS MODE FAULT alert, or
- The flight crew engages another AP/FD vertical mode (e.g. in the case of go-around).

Note: If the AP/FD TCAS mode is lost while engaged, the vertical mode reverts to V/S. The vertical speed target is:
- *0 ft/min if the RA order was to descend*
- *The TCAS vertical speed target at the time of the failure, if the RA order was to climb.*

NORMAL OPERATIONS - WHEN A TA IS TRIGGERED

Ident.: DSC-22_30-40-100-00022932.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

When a TA alert is triggered, the AP/FD TCAS mode arms.

CONSEQUENCE ON AP AND FD

When the AP/FD TCAS mode arms, the AP and FDs engagement status does not change.

CONSEQUENCE ON AP/FD LATERAL MODE

When the AP/FD TCAS mode arms, any engaged (armed) AP/FD lateral mode remains engaged (armed).

CONSEQUENCE ON AP/FD VERTICAL MODE

When the AP/FD TCAS mode arms, any armed (engaged) AP/FD vertical mode remains armed (engaged).
The FMA displays TCAS on Line 3 of the "AP/FD Vertical Modes" column. Therefore, if another AP/FD vertical mode is armed, the FMA displays both modes.

NORMAL OPERATIONS - WHEN A RA IS TRIGGERED

Applicable to: LV-KAN, LV-KAO

Ident.: DSC-22_30-40-100-A-00022933.0001001 / 18 MAY 22

At occurrence of any preventive or corrective RA, the AP/FD TCAS mode engages. It provides vertical guidance in accordance with the TCAS vertical speed orders.

Ident.: DSC-22_30-40-100-A-00025020.0001001 / 18 MAY 22

CONSEQUENCE ON AP AND FD

When the AP/FD TCAS mode engages:
- The AP engagement status does not change
- If not previously engaged, the FDs automatically engage.

Ident.: DSC-22_30-40-100-A-00025021.0001001 / 18 MAY 22

CONSEQUENCE ON AP/FD LATERAL MODE

When the AP/FD TCAS mode engages, any engaged (armed) AP/FD lateral mode remains engaged (armed).
If both APs and both FDs are disengaged, when the AP/FD TCAS mode engages, HDG automatically engages. The heading target is the aircraft heading at HDG engagement.

Note: *When the AP/FD TCAS mode disengages (e.g. at the CLEAR OF CONFLICT), the FMA displays the TRK FPA DESELECTED message for 10 s on Line 3 of the "Special Messages" column, if the flying reference was TRK-FPA before the AP/FD TCAS mode engagement.*

Ident.: DSC-22_30-40-100-A-00025022.0001001 / 18 MAY 22

CONSEQUENCE ON AP/FD VERTICAL MODE

GUIDANCE

Depending on the RA and the FCU selected altitude, the AP/FD TCAS mode uses the guidance law of one of the following modes: V/S, ALT*, ALT, ALT CRZ*, ALT CRZ.

V/S Guidance

The AP/FD TCAS mode uses the guidance law of the V/S mode if:

- ALT / ALT CRZ is not armed, or
- The FCU selected altitude of ALT*, ALT, ALT CRZ* or ALT CRZ is not compatible with the RA order.

The vertical speed target is one of the following values:

- The aircraft vertical speed at the engagement of the AP/FD TCAS mode, if a preventive RA is triggered, or
- The limit between the green and red area of the vertical speed scale, ± 200 ft/min if the aircraft should climb (descend).

L2 The AP/FD TCAS mode ensures that the aircraft speed remains between VLS - 5 kt (VLS - 2 kt in landing configuration) and VMAX.

L1 *Note:* *In order to ensure a rapid response to the RA, the initial vertical speed may temporarily exceed the vertical speed target of the TCAS. The peak of the vertical speed is reached in less than 5 s after the vertical speed enters the TCAS green area.*

If the RA order changes, the AP/FD TCAS mode follows the new target.

ALT*, ALT, ALT CRZ* or ALT CRZ Guidance

The AP/FD TCAS mode uses the guidance law of the ALT / ALT CRZ / ALT* / ALT CRZ* mode if:

- ALT / ALT CRZ is armed, and
- The FCU selected altitude of ALT*, ALT, ALT CRZ* or ALT CRZ is compatible with the RA order.

Ident.: DSC-22_30-40-100-A-00025024.0001001 / 18 MAY 22

AP/FD VERTICAL MODE ENGAGED AT OCCURRENCE OF THE RA

When the AP/FD TCAS mode engages, any engaged AP/FD vertical mode disengages.

Note:
- *If G/S / F-G/S ◁ is engaged, when the AP/FD TCAS mode engages:*
  - *G/S / F-G/S ◁ disengages*
  - *LOC / F-LOC ◁ remains engaged*
  - *The APPR pb comes off, and the LOC pb comes on.*
- *If FINAL APP is engaged , when the AP/FD TCAS mode engages:*
  - *FINAL APP disengages*
  - *Managed lateral guidance remains engaged with NAV engaged*
  - *The APPR pb comes off.*

Ident.: DSC-22_30-40-100-A-00025025.0001001 / 18 MAY 22

AP/FD VERTICAL MODE ARMED AT OCCURRENCE OF THE RA

When the AP/FD TCAS mode engages, any armed AP/FD vertical mode disarms, except ALT / ALT CRZ if the altitude capture is compatible with the RA order.

Note:
- *If G/S / F-G/S ◁ is armed, when the AP/FD TCAS mode engages:*
  - *G/S / F-G/S ◁ disarms*
  - *The APPR pb comes off, and the LOC pb comes on.*
- *If FINAL is armed , when the AP/FD TCAS mode engages:*
  - *FINAL disarms*
  - *Managed lateral guidance remains engaged with NAV engaged*
  - *The APPR pb comes off.*

Note: *If the approach is re-armed and if the capture conditions are fulfilled, the corresponding approach mode engages. The AP/FD TCAS mode disengages (even if it is not CLEAR OF CONFLICT). A RA may be triggered again.*

CAPTURE OF THE SELECTED ALTITUDE IN AP/FD TCAS MODE

If ALT / ALT CRZ is armed, when the AP/FD TCAS mode engages:

- ALT / ALT CRZ remains armed if the capture of the FCU selected altitude is compatible with the RA order, and if the selected level is reached before the CLEAR OF CONFLICT.
  L2 If ALT / ALT CRZ is armed, and ALT capture conditions occur during the RA, the AP/FD TCAS mode captures the FCU selected altitude (without ALT* indicated on the FMA).
  This can occur when the TCAS triggers a preventive RA "MONITOR VERTICAL SPEED", or a corrective RA "ADJUST VERTICAL SPEED, ADJUST" aural alert.
  However, if the vertical speed order of the RA is zero, ALT / ALT CRZ disarms.
- L1 ALT / ALT CRZ disarms, if the capture of the FCU selected altitude is not compatible with the RA order.

WHITE BOX ON FMA

When a vertical mode disarms at AP/FD TCAS mode engagement, the FMA displays a white box for 10 s.

Ident.: DSC-22_30-40-100-A-00025026.0001001 / 18 MAY 22

CONSEQUENCE ON A/THR AND SPEED/MACH CONTROL

When the AP/FD TCAS mode engages:

- If the A/THR is disconnected, it becomes armed or active, depending on the thrust lever position
- If the A/THR is armed, it remains armed
- If the A/THR is active, it remains active.

A/THR ACTIVE

When the AP/FD TCAS mode engages, if the A/THR becomes / remains active, the SPEED/MACH mode engages.
The speed/Mach control becomes selected, and the speed/Mach target becomes the aircraft speed/Mach at the occurrence of the RA.
L2 If a new RA order occurs, the speed/Mach target changes, and becomes the aircraft speed/Mach at the occurrence of the new RA.

L1 A/THR ARMED

When the AP/FD TCAS mode engages, if the A/THR becomes / remains armed, the thrust target does not change.
The FMA displays the A/THR message, in accordance with the thrust lever position (e.g. MAN THR, MAN TOGA).

L2 *Note:* *If the flight crew sets the thrust levers to the CL detent, the A/THR activates. The SPEED/MACH mode engages. The speed/Mach control becomes selected, and the speed/Mach target becomes the aircraft speed/Mach at the A/THR activation.*

L1 LVR CLB Message on the FMA

In the case of AP/FD TCAS mode engagement when the A/THR is armed (e.g. RA order triggers below the THR RED ALT):
- If the vertical speed order of the RA is above 500 ft/min, the LVR CLB message is inhibited.
  However, if the speed becomes greater than VFE - 20 kt, the LVR CLB message flashes on the FMA.
- If the vertical speed order of the RA is equal to, or below 500 ft/min, the LVR CLB message flashes on the FMA even when below the THR RED ALT.

Ident.: DSC-22_30-40-100-A-00025027.0001001 / 18 MAY 22

CONSEQUENCE ON ALPHA FLOOR

When AP/FD TCAS mode is engaged, ALPHA FLOOR is temporarily inhibited:
- If all thrust levers are set to CLB detent when the RA is triggered, ALPHA FLOOR is inhibited while AP/FD TCAS mode is engaged.
- If at least one thrust lever is below the CLB detent when the RA is triggered, LVR CLB flashes on the FMA and ALPHA FLOOR is inhibited during 5 s, then:
  - If all thrust levers are set to the CLB detent, ALPHA FLOOR inhibition is maintained while AP/FD TCAS mode is engaged.
  - If at least one thrust lever remains below the CLB detent, ALPHA FLOOR is reactivated.

NORMAL OPERATIONS - WHEN CLEAR OF CONFLICT

Ident.: DSC-22_30-40-100-00025232.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

When the "CLEAR OF CONFLICT" aural alert sounds, the AP/FD TCAS mode automatically disengages. The AP/FD provides guidance toward the previous FCU selected altitude.

CONSEQUENCE ON AP/FD LATERAL MODE

When the AP/FD TCAS mode disengages, any engaged / armed AP/FD lateral mode remains engaged / armed.

CONSEQUENCE ON AP/FD VERTICAL MODE

When the AP/FD TCAS mode disengages, one of the following modes engages: V/S, ALT*, ALT, ALT CRZ*, or ALT CRZ.

AP/FD TCAS MODE REVERSION TO ALT / ALT CRZ / ALT* / ALT CRZ*

If ALT / ALT CRZ is armed, when the AP/FD TCAS mode disengages:

- ALT* / ALT CRZ* engages, if the aircraft is within the capture zone of the FCU selected altitude
- ALT / ALT CRZ engages, if the aircraft altitude is equal to the FCU selected altitude
- In all other cases, V/S engages.

AP/FD TCAS MODE REVERSION TO V/S

When the AP/FD TCAS mode reverts to V/S when clear of conflict, all of the following occurs:

- ALT or ALT CRZ arms
- A triple click audio indicator sounds, and the pitch bar flashes for 10 s
- The vertical speed target depends on whether a preventive RA occurred, or a corrective RA occurred.

Vertical Speed Target - A Preventive RA Occurred

The vertical speed target remains the vertical speed target at the triggering of the RA.

Vertical Speed Target - A Corrective RA Occurred

The vertical speed target becomes:

- 500 ft/min, if the aircraft is at, or above 30 000 ft, and the FCU selected altitude is above the aircraft
- ±1 000 ft/min, in all other cases.
  V/S leads the aircraft toward the FCU selected altitude.

AP/FD MODE REVERSIONS

Ident.: DSC-22_30-40-110-A-00025005.0001001 / 18 MAY 22
Applicable to: ALL

REVERSION DUE TO FCU ALTITUDE CHANGES

Conditions	Event	Consequence
OP CLB engaged CLB engaged	FCU selected altitude set below A/C altitude	V/S-FPA engages. (*Refer to DSC-22_30-40-70 Reversions to V/S / FPA*)
OP DES engaged DES engaged	FCU selected altitude set above A/C altitude	
ALT * active	FCU selected altitude modification (greater than 250 ft)	

Ident.: DSC-22_30-40-110-A-00025006.0001001 / 18 MAY 22
Applicable to: ALL

REVERSION DUE TO THE LOSS OF NAV MODE

Conditions	Event	Consequence
CLB engaged	Loss of lateral managed mode: NAV	OP CLB engages
DES engaged		V/S engages. (*Refer to DSC-22_30-40-70 Reversions to V/S / FPA*)

Ident.: DSC-22_30-40-110-A-00025007.0001001 / 18 MAY 22
Applicable to: ALL

SPEED PROTECTION WHEN FD ORDERS ARE NOT FOLLOWED BY THE FLIGHT CREW (AP NOT ENGAGED)

Conditions	Event	Consequence
FD engaged with: - AP OFF, and - OP DES or DES engaged, and - A/THR active (IDLE thrust).	IAS = VLS-2 kt (between VLS-2 kt and VLS-19 kt depending on the position of the speedbrakes)	FD bars disappear. If A/THR active, automatic engagement of SPEED mode on the A/THR. Thrust increases to recover the speed target.
FD is engaged with: - AP off, and - OP CLB or CLB engaged, and - A/THR active (CLIMB thrust).	IAS = VMAX+4 kt	FD bars disappear. If A/THR active, automatic engagement of SPEED mode on the A/THR. Thrust decreases to recover the speed target.

Ident.: DSC-22_30-40-110-A-00025008.0002001 / 18 MAY 22
Applicable to: ALL

SPEED PROTECTION DUE TO EXCESSIVE V/S

Conditions	Event	Consequence
Excessive V/S or FPA selected in climb	IAS = VLS (or VLS-5 kt if target is VLS)	The selected V/S (or FPA) target is temporarily disregarded to maintain VLS in climb, or VMAX in descent.
Excessive V/S or FPA selected in descent	IAS = VMAX	

Note: *When flying with FD bars only (AP OFF), the FMGES adjusts the pitch so that VLS in climb, or VMAX in descent is maintained. However, no triple click is generated and the V/S target displayed on the FMA remains unchanged.*

Ident.: DSC-22_30-40-110-A-00025009.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

SPEED PROTECTION DUE TO EXCESSIVE V/S TARGET (AP/FD TCAS MODE ENGAGED)

Conditions	Event	Consequence
Excessive V/S target in climb	IAS reaching VLS (or VLS - 5 kt if target is VLS or VLS - 2 kt if target is VLS in landing configuration)	The TCAS RA V/S target is temporarily disregarded to maintain VLS in climb, or VMAX in descent.
Excessive V/S target in descent	IAS reaching VMAX	

Note: *When flying with FD bars only (AP OFF), the FMGES adjusts the pitch so that VLS in climb, or VMAX in descent is maintained. However, no triple click is generated and the V/S target displayed on the FMA remains unchanged.*

Takeoff

TAKEOFF WITH NAV

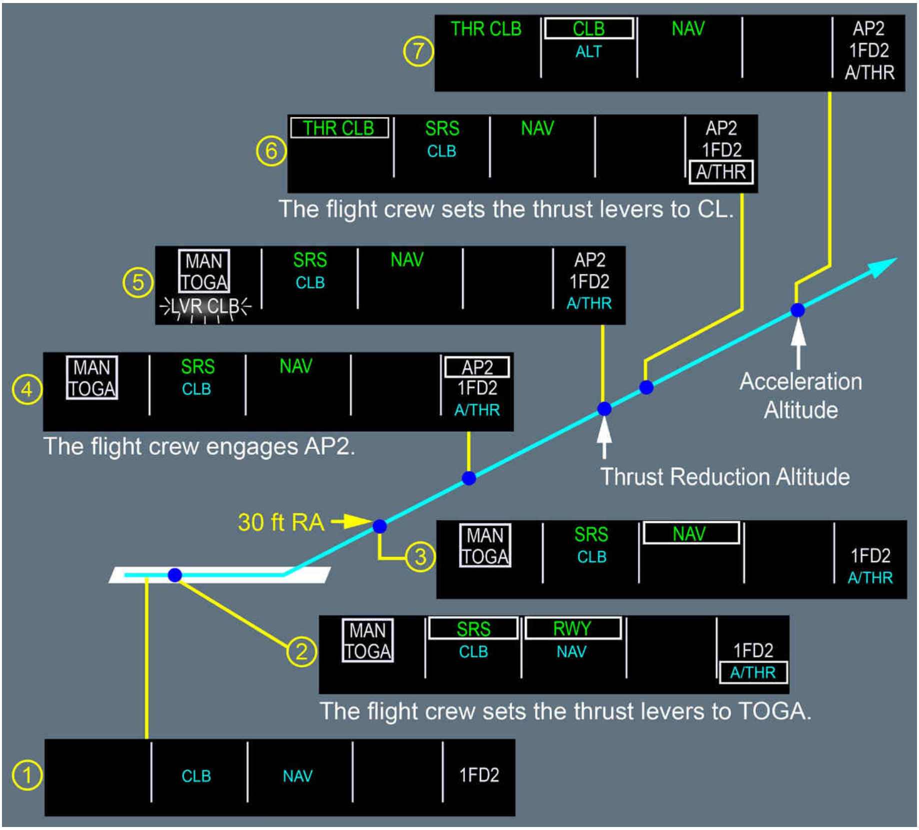
Ident.: DSC-22_30-40-120-20-00025712.0001001 / 18 MAY 22
Applicable to: ALL

NAV and CLB arm when the aircraft is on ground, and:

- The FDs are engaged
- A runway and a SID are selected in the flight plan
- V2 is inserted in the PERF TAKEOFF page
- No FLX TO temperature, nor DRT TO level (Derated Takeoff ◁) is entered in the PERF TAKEOFF page
- The FCU selected altitude is set above the acceleration altitude
- The slats are extended.

When the aircraft is at the runway threshold, and the flight crew sets the thrust levers to TOGA, SRS and RWY engage, and MAN TOGA appears on the FMA.
At least 5 s after liftoff, the flight crew can engage one AP.
At 30 ft RA, RWY disengages, and NAV engages.
When the aircraft reaches the thrust reduction altitude, LVR CLB flashes. The flight crew sets the thrust levers to the CL detent, MAN TOGA disappears, and THR CLB engages.
At the acceleration altitude, SRS disengages, and CLB engages.
From liftoff to the acceleration altitude, the managed speed target is V2+10 kt. At the acceleration altitude, the managed speed target becomes the applicable FMS speed target (e.g. CLB SPD LIM, ECON speed).

Takeoff with NAV


⑦
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
⑥
THR CLB
SRS
CLB
NAV
AP2
1FD2
A/THR
The flight crew sets the thrust levers to CL.
⑤
MAN
TOGA
LVR CLB
SRS
CLB
NAV
AP2
1FD2
A/THR
④
MAN
TOGA
SRS
CLB
NAV
AP2
1FD2
A/THR
The flight crew engages AP2.
Acceleration Altitude
Thrust Reduction Altitude
30 ft RA
③
MAN
TOGA
SRS
CLB
NAV
1FD2
A/THR
②
MAN
TOGA
SRS
CLB
RWY
NAV
1FD2
A/THR
The flight crew sets the thrust levers to TOGA.
①
CLB
NAV
1FD2

TAKEOFF WITH HDG/TRK PRESET

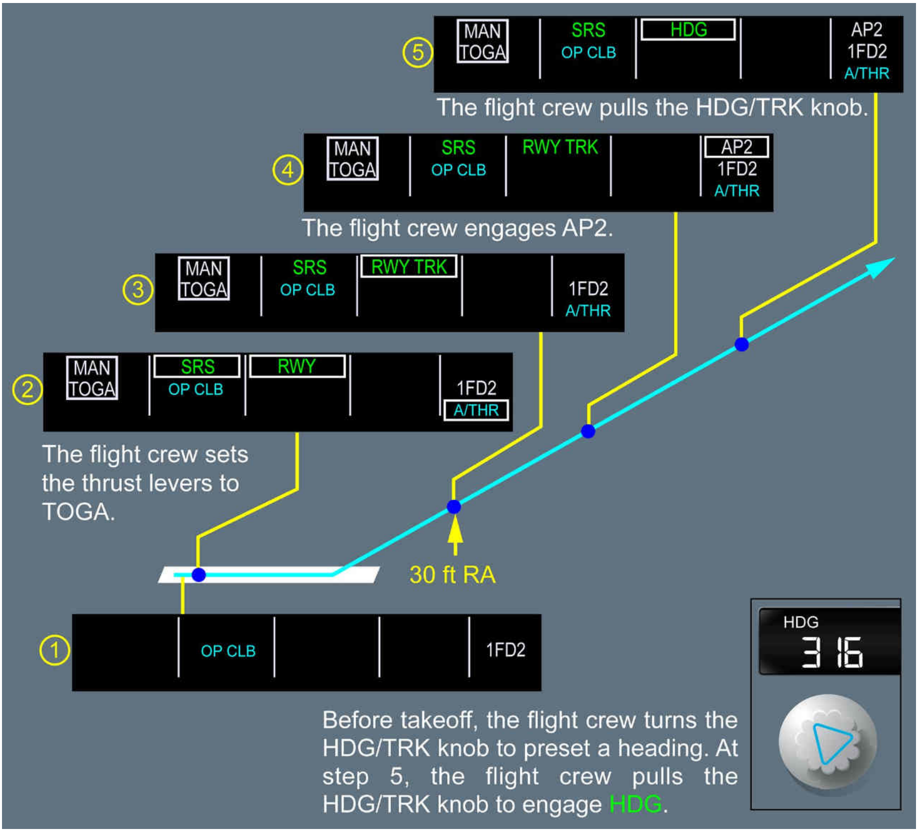
Ident.: DSC-22_30-40-120-20-00025713.0001001 / 04 MAY 23
Applicable to: ALL

OP CLB arms when the aircraft is on ground, and:
- The FDs are engaged
- A runway is selected in the flight plan
- V2 is inserted in the PERF TAKE OFF page
- No FLX TO temperature, nor DRT TO level (Derated Takeoff ⪡) is entered in the PERF TAKEOFF page
- The FCU selected altitude is set above the acceleration altitude

- The flight crew turned the HDG/TRK knob on the FCU to select a heading (or track) preset The HDG/TRK window displays the heading (or track). The display remains, as long as RWY, RWY TRK, and HDG (or TRACK) are engaged.
- The slats are extended.

When the aircraft is at the runway threshold, and the flight crew sets the thrust levers to TOGA, SRS and RWY engage, and MAN TOGA appears on the FMA.
At least 5 s after liftoff, the flight crew can engage one AP.
At 30 ft RA, RWY disengages, and RWY TRK engages.
When the flight crew pulls the HDG/TRK knob, HDG engages (HDG-V/S is selected).
At the thrust reduction altitude, THR CLB engages.
At the acceleration altitude, OP CLB engages.
From liftoff to the acceleration altitude, the managed speed target is V2+10 kt. At the acceleration altitude, the managed speed target becomes the applicable FMS speed target (e.g. CLB SPD LIM, ECON speed).

Takeoff with HDG/TRK Preset


⑤
MAN TOGA
SRS
OP CLB
HDG
AP2
1FD2
A/THR
The flight crew pulls the HDG/TRK knob.
④
MAN TOGA
SRS
OP CLB
RWY TRK
AP2
1FD2
A/THR
The flight crew engages AP2.
③
MAN TOGA
SRS
OP CLB
RWY TRK
1FD2
A/THR
②
MAN TOGA
SRS
OP CLB
RWY
1FD2
A/THR
The flight crew sets the thrust levers to TOGA.
30 ft RA
①
OP CLB
1FD2
HDG
316

Before takeoff, the flight crew turns the HDG/TRK knob to preset a heading. At step 5, the flight crew pulls the HDG/TRK knob to engage HDG.

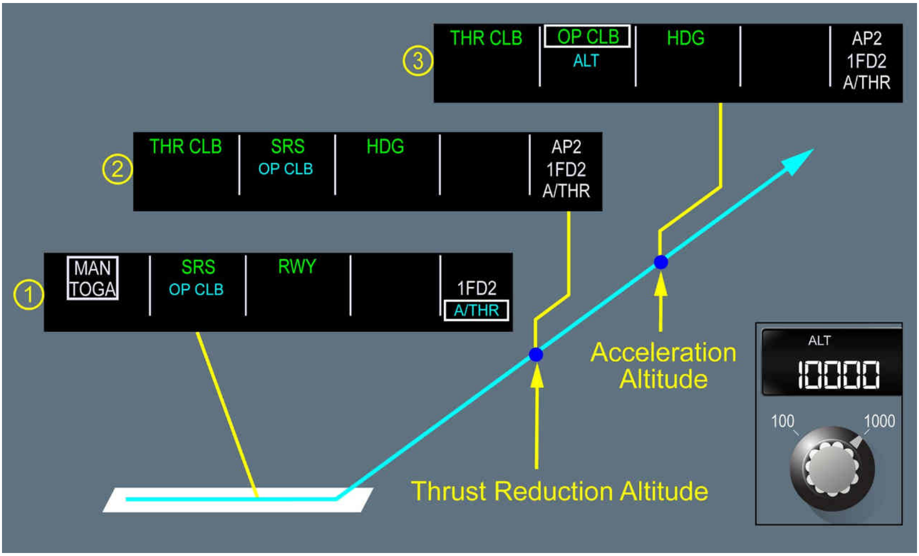
Climb with OP CLB Mode

AT THE ACCELERATION ALTITUDE

Ident.: DSC-22_30-40-120-30-00025714.0001001 / 18 MAY 22
Applicable to: ALL

On ground, OP CLB arms, if NAV is not armed.
OP CLB automatically engages at the acceleration altitude.

At the Acceleration Altitude

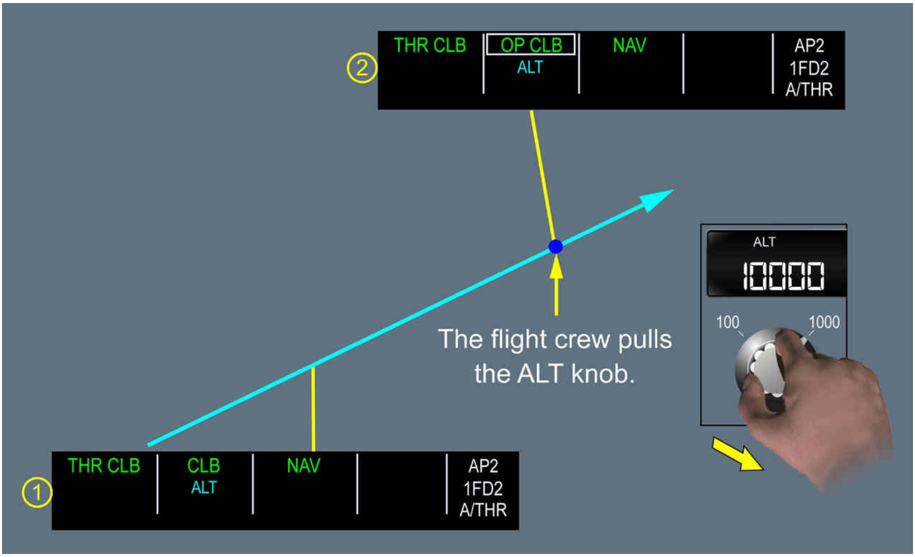

THR CLB
OP CLB
ALT
HDG
AP2
1FD2
A/THR
③
THR CLB
SRS
OP CLB
HDG
AP2
1FD2
A/THR
②
MAN
TOGA
SRS
OP CLB
RWY
1FD2
A/THR
①
Acceleration Altitude
Thrust Reduction Altitude
ALT
10000
100
1000

THE FLIGHT CREW PULLS THE ALT KNOB

Ident.: DSC-22_30-40-120-30-00025715.0001001 / 18 MAY 22
Applicable to: ALL

If CLB is engaged, and the flight crew pulls the ALT knob, OP CLB engages.

The Flight Crew Pulls the ALT Knob


② THR CLB | OP CLB ALT | NAV | AP2 1FD2 A/THR
ALT
10000
100
1000
The flight crew pulls the ALT knob.
① THR CLB | CLB ALT | NAV | AP2 1FD2 A/THR

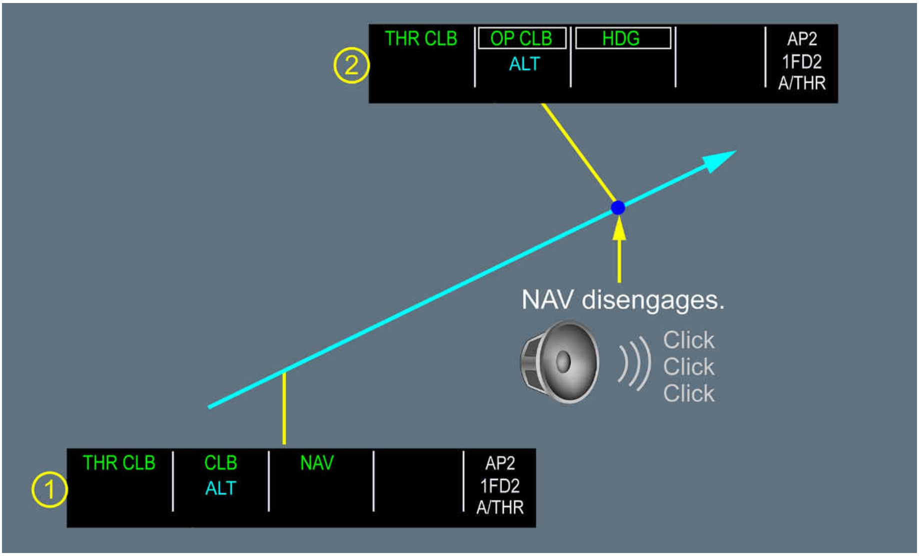
NAV DISENGAGES

Ident.: DSC-22_30-40-120-30-00025716.0001001 / 04 MAY 23
Applicable to: ALL

If CLB and NAV are engaged and NAV disengages, CLB disengages, and OP CLB engages.

The transition from CLB to OP CLB is a reversion with a triple click, if NAV disengages due to one of the following conditions:
- The aircraft reaches a flight plan discontinuity
- The next altitude target is an altitude constraint, and the flight crew engages HDG/TRACK mode.

NAV Disengages


THR CLB
OP CLB
ALT
HDG
AP2
1FD2
A/THR
②
NAV disengages.
Click
Click
Click
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
①

Intentionally left blank

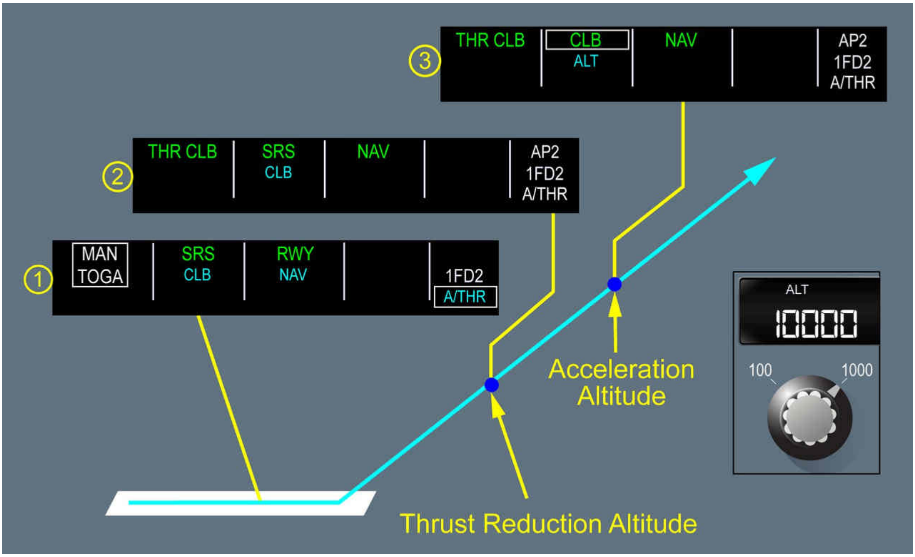
Climb with CLB Mode

AT THE ACCELERATION ALTITUDE

Ident.: DSC-22_30-40-120-40-00025717.0001001 / 18 MAY 22
Applicable to: ALL

On ground, with NAV armed, CLB arms. CLB automatically engages at the acceleration altitude.

At the Acceleration Altitude

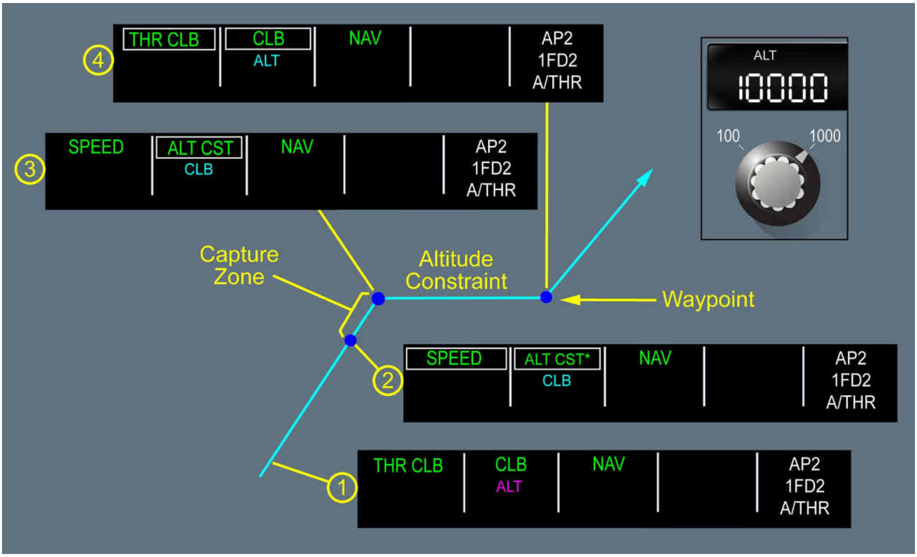

③
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
②
THR CLB
SRS
CLB
NAV
AP2
1FD2
A/THR
①
MAN
TOGA
SRS
CLB
RWY
NAV
1FD2
A/THR
ALT
10000
100
1000
Acceleration Altitude
Thrust Reduction Altitude

CLIMBING TOWARD AN ALTITUDE CONSTRAINT

Ident.: DSC-22_30-40-120-40-00025718.0001001 / 18 MAY 22
Applicable to: ALL

If the aircraft reaches an altitude constraint when CLB is engaged, the ALT CST mode engages and CLB becomes arms.
When the aircraft sequences the waypoint that defines the end of the altitude constraint of the FMS flight plan, CLB recovers.

Climbing toward an Altitude Constraint


④
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
③
SPEED
ALT CST
CLB
NAV
AP2
1FD2
A/THR
ALT
10000
100
1000
Capture Zone
Altitude Constraint
Waypoint
②
SPEED
ALT CST*
CLB
NAV
AP2
1FD2
A/THR
①
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR

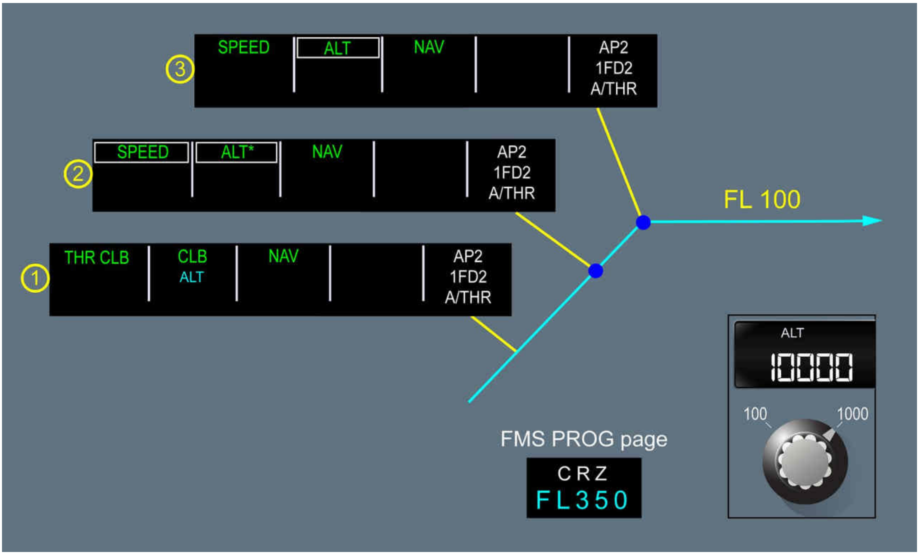
Altitude with ALT

CLB AND ALT - EXAMPLE 1

Ident.: DSC-22_30-40-120-50-00025719.0001001 / 18 MAY 22
Applicable to: ALL

The vertical guidance is managed, and the aircraft climbs toward the FCU selected altitude (e.g. FL 100), with no altitude constraint.

CLB and ALT - Example 1

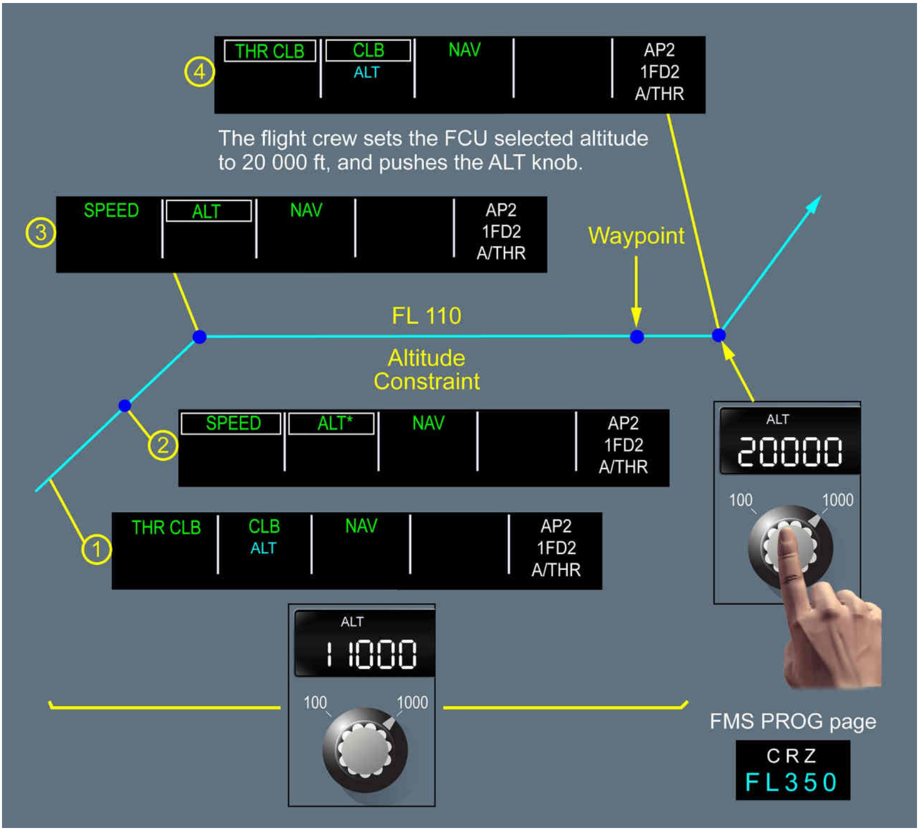

③
SPEED
ALT
NAV
AP2
1FD2
A/THR
②
SPEED
ALT*
NAV
AP2
1FD2
A/THR
①
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
FL 100
ALT
10000
100
1000
FMS PROG page
CRZ
FL350

CLB AND ALT - EXAMPLE 2

Ident.: DSC-22_30-40-120-50-00025720.0001001 / 18 MAY 22
Applicable to: ALL

The vertical guidance is managed, and:
- The FCU selected altitude (e.g. FL 110) is equal to the altitude constraint (e.g. FL 110)
- The aircraft climbs toward the altitude constraint.

CLB and ALT - Example 2

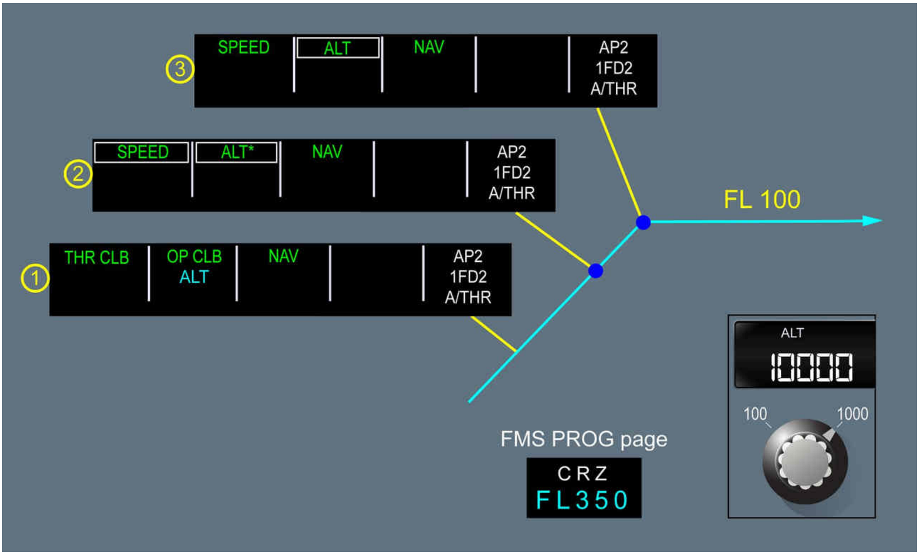

④
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
The flight crew sets the FCU selected altitude to 20 000 ft, and pushes the ALT knob.
③
SPEED
ALT
NAV
AP2
1FD2
A/THR
Waypoint
FL 110
Altitude Constraint
②
SPEED
ALT*
NAV
AP2
1FD2
A/THR
①
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
ALT
20000
100
1000
ALT
11000
100
1000
FMS PROG page
CRZ
FL350

OP CLB AND ALT

Ident.: DSC-22_30-40-120-50-00025721.0001001 / 18 MAY 22
Applicable to: ALL

OP CLB is engaged, and the aircraft climbs toward the FCU selected altitude (e.g. FL 100).

OP CLB and ALT

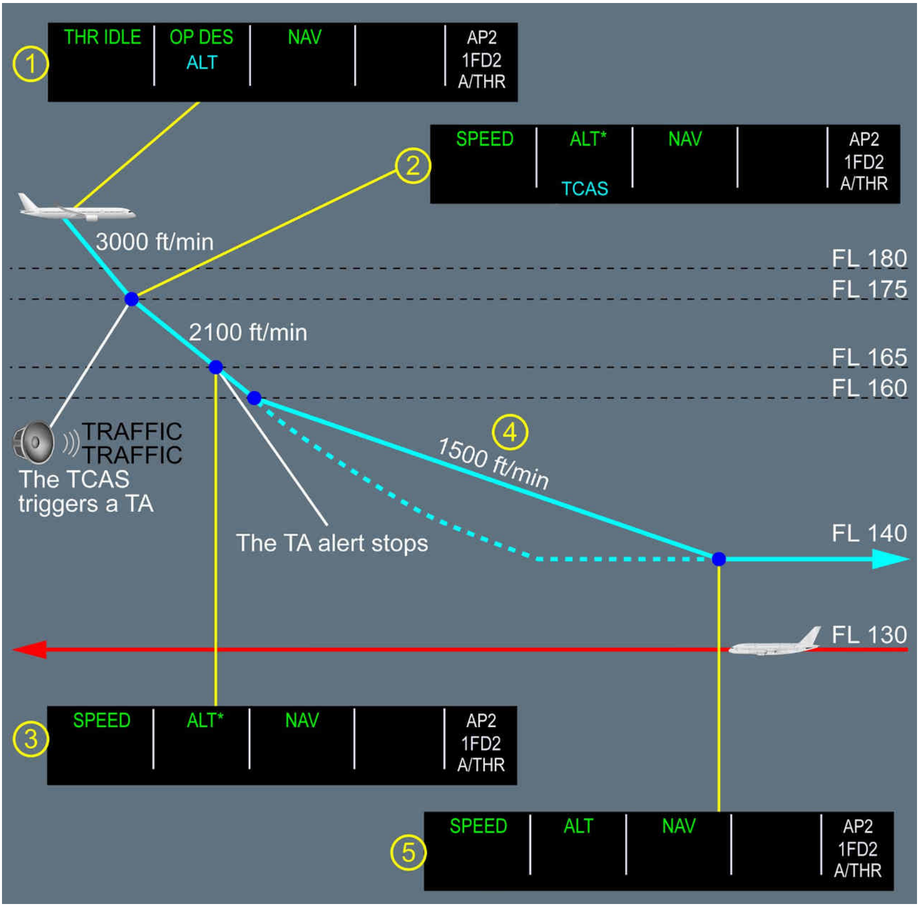

③
SPEED
ALT
NAV
AP2
1FD2
A/THR
②
SPEED
ALT*
NAV
AP2
1FD2
A/THR
①
THR CLB
OP CLB
ALT
NAV
AP2
1FD2
A/THR
FL 100
ALT
10000
100
1000
FMS PROG page
CRZ
FL350

ALT IN DESCENT WITH TCAS TA

Ident.: DSC-22_30-40-120-50-00025722.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The aircraft levels off in descent with a TCAS Traffic Advisory (TA).

ALT in Descent with TCAS TA


①
THR IDLE
OP DES
ALT
NAV
AP2
1FD2
A/THR
②
SPEED
ALT*
TCAS
NAV
AP2
1FD2
A/THR
3000 ft/min
FL 180
FL 175
2100 ft/min
FL 165
FL 160
TRAFFIC
TRAFFIC
The TCAS
triggers a TA
④
1500 ft/min
The TA alert stops
FL 140
FL 130
③
SPEED
ALT*
NAV
AP2
1FD2
A/THR
⑤
SPEED
ALT
NAV
AP2
1FD2
A/THR

Altitude with ALT CST

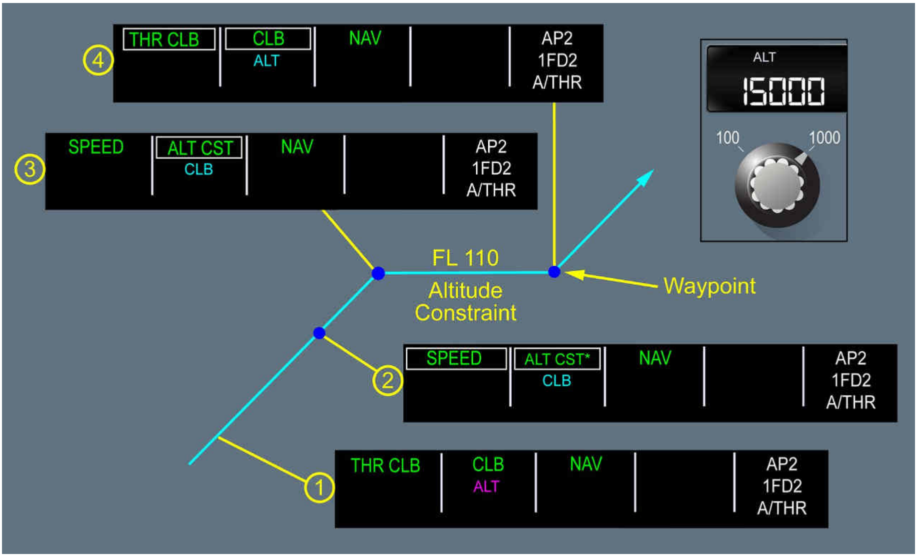
CLB AND ALT CST

Ident.: DSC-22_30-40-120-60-00025723.0001001 / 18 MAY 22
Applicable to: ALL

The vertical guidance is managed, and:

- The FCU selected altitude (e.g. FL 150) is above an altitude constraint (e.g. FL 110)
- The aircraft climbs toward the altitude constraint.

CLB and ALT CST


4
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR
ALT
15000
100
1000
3
SPEED
ALT CST
CLB
NAV
AP2
1FD2
A/THR
FL 110
Altitude
Constraint
Waypoint
2
SPEED
ALT CST*
CLB
NAV
AP2
1FD2
A/THR
1
THR CLB
CLB
ALT
NAV
AP2
1FD2
A/THR

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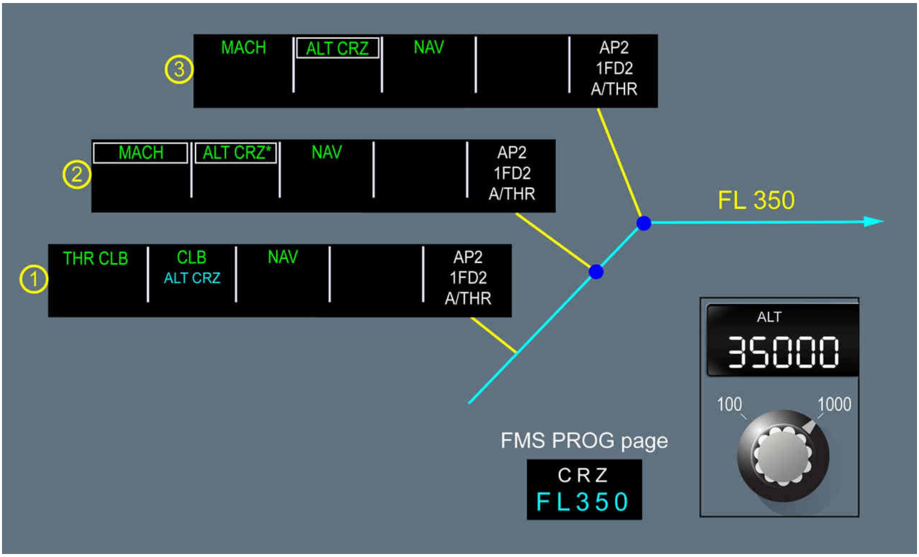
Altitude with ALT CRZ

CLB AND ALT CRZ

Ident.: DSC-22_30-40-120-70-00025724.0001001 / 18 MAY 22
Applicable to: ALL

The vertical guidance is managed, and:
- The FCU selected altitude is equal to the cruise altitude (e.g. FL 350)
- The aircraft climbs toward the cruise altitude.

CLB and ALT CRZ

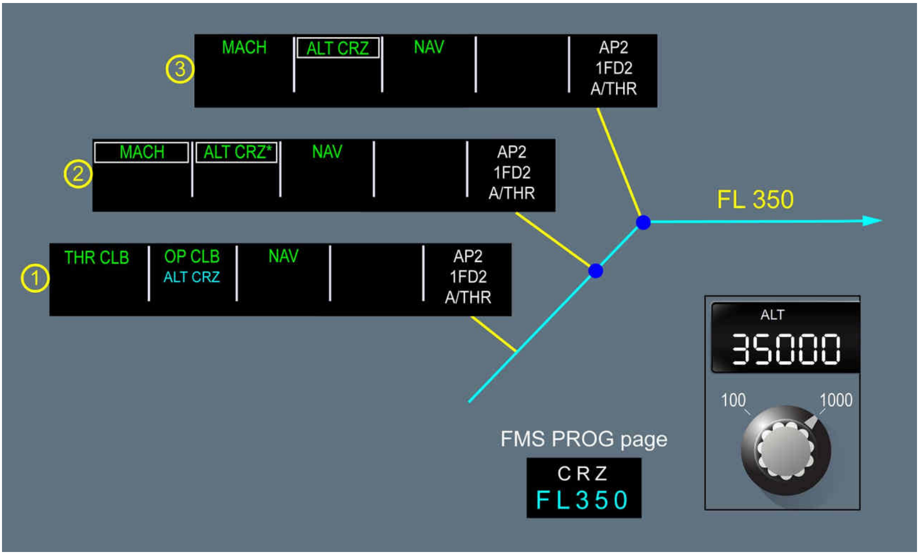

③
MACH
ALT CRZ
NAV
AP2
1FD2
A/THR
②
MACH
ALT CRZ*
NAV
AP2
1FD2
A/THR
①
THR CLB
CLB
ALT CRZ
NAV
AP2
1FD2
A/THR
FL 350
ALT
35000
100
1000
FMS PROG page
CRZ
FL350

OP CLB AND ALT CRZ

Ident.: DSC-22_30-40-120-70-00025725.0001001 / 18 MAY 22
Applicable to: ALL

OP CLB is engaged, and:
- The FCU selected altitude is equal to the cruise altitude (e.g. FL 350)
- The aircraft climbs toward the cruise altitude (e.g. FL 350).

OP CLB and ALT CRZ

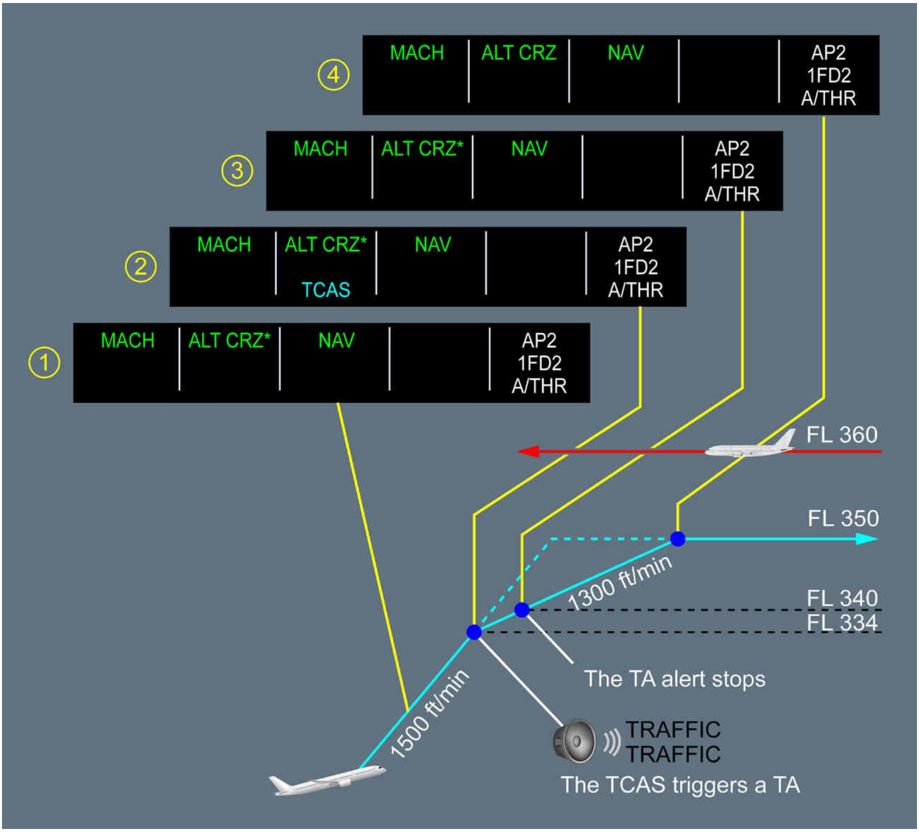

③
MACH
ALT CRZ
NAV
AP2
1FD2
A/THR
②
MACH
ALT CRZ*
NAV
AP2
1FD2
A/THR
①
THR CLB
OP CLB
ALT CRZ
NAV
AP2
1FD2
A/THR
FL 350
ALT
35000
100
1000
FMS PROG page
CRZ
FL350

ALT CRZ WITH TCAS TA

Ident.: DSC-22_30-40-120-70-00025726.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

The aircraft levels off at the cruise altitude, with a TCAS Traffic Advisory (TA).

ALT CRZ with TCAS TA


④
MACH | ALT CRZ | NAV | | AP2 1FD2 A/THR
③
MACH | ALT CRZ* | NAV | | AP2 1FD2 A/THR
②
MACH | ALT CRZ* TCAS | NAV | | AP2 1FD2 A/THR
①
MACH | ALT CRZ* | NAV | | AP2 1FD2 A/THR
FL 360
FL 350
FL 340
FL 334
1300 ft/min
1500 ft/min
The TA alert stops
TRAFFIC
TRAFFIC
The TCAS triggers a TA

Note: The same principle applies, if the aircraft levels off at the cruise altitude with the ALT mode.

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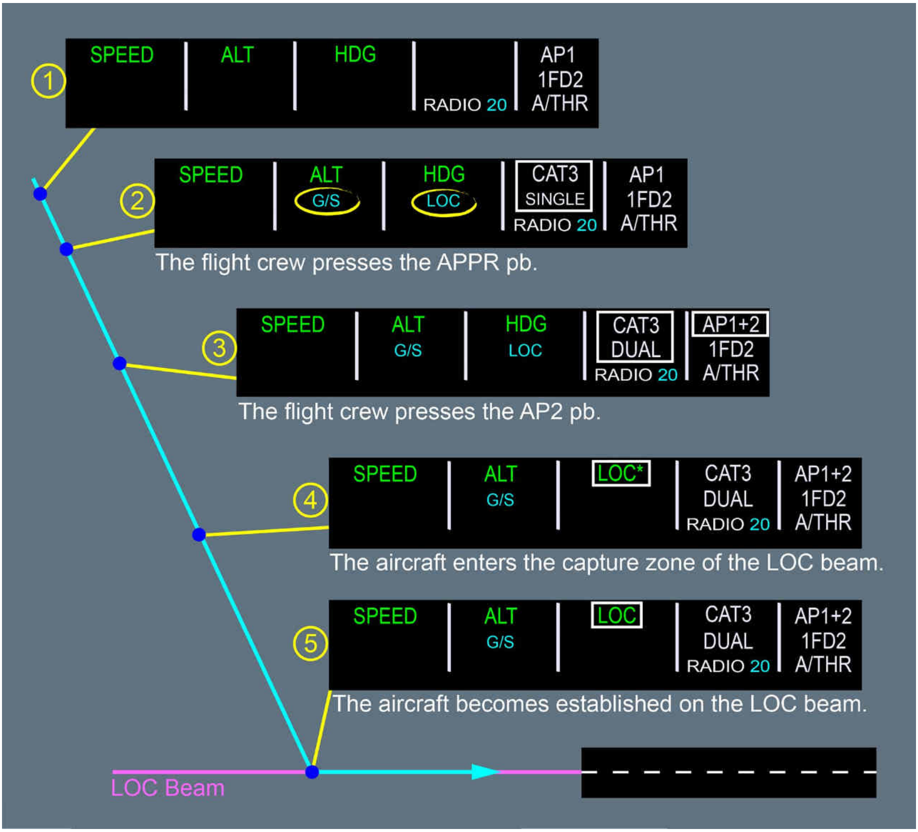
Approach and Landing

ILS APPROACH AND AUTOLAND

Ident.: DSC-22_30-40-120-80-00025731.0001001 / 18 MAY 22
Applicable to: ALL

The flight crew selected an ILS approach on the ARRIVAL page.
AP1 is engaged, and a heading is selected to fly toward the LOC beam.

ILS Approach and Autoland - Step 1 to 5


①
SPEED
ALT
HDG
RADIO 20
AP1
1FD2
A/THR
②
SPEED
ALT
G/S
HDG
LOC
CAT3
SINGLE
RADIO 20
AP1
1FD2
A/THR
③
SPEED
ALT
G/S
HDG
LOC
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
④
SPEED
ALT
G/S
LOC*
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
⑤
SPEED
ALT
G/S
LOC
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
LOC Beam

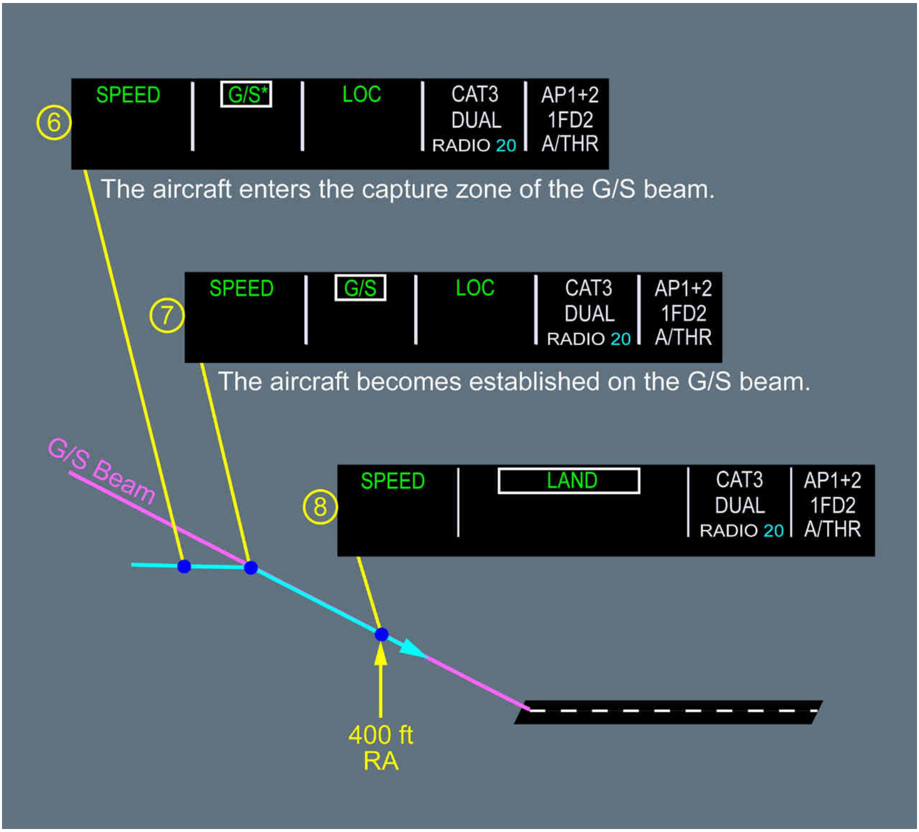
The flight crew presses the APPR pb.

The flight crew presses the AP2 pb.

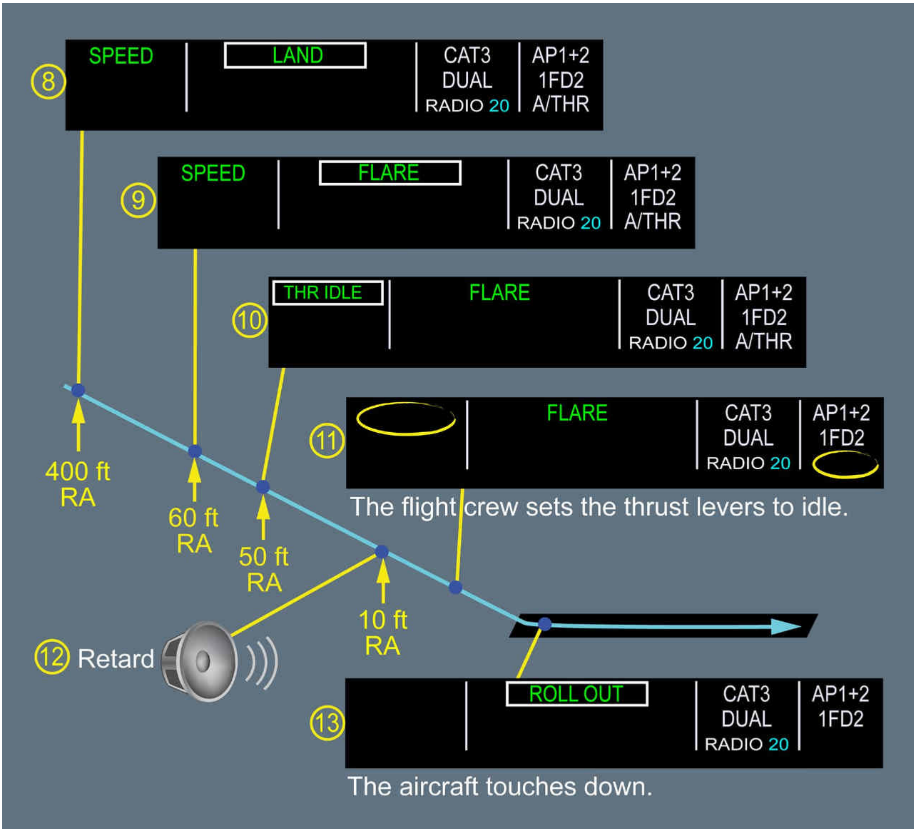
The aircraft enters the capture zone of the LOC beam.

The aircraft becomes established on the LOC beam.

ILS Approach and Autoland - Step 6 to 8


⑥
SPEED
G/S*
LOC
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
The aircraft enters the capture zone of the G/S beam.
⑦
SPEED
G/S
LOC
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
The aircraft becomes established on the G/S beam.
G/S Beam
⑧
SPEED
LAND
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
400 ft
RA

ILS Approach and Autoland - Step 8 to 13


⑧
SPEED
LAND
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
⑨
SPEED
FLARE
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
⑩
THR IDLE
FLARE
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
⑪
FLARE
CAT3
DUAL
RADIO 20
AP1+2
1FD2
400 ft
RA
60 ft
RA
50 ft
RA
10 ft
RA
⑫ Retard
⑬
ROLL OUT
CAT3
DUAL
RADIO 20
AP1+2
1FD2

The flight crew sets the thrust levers to idle.

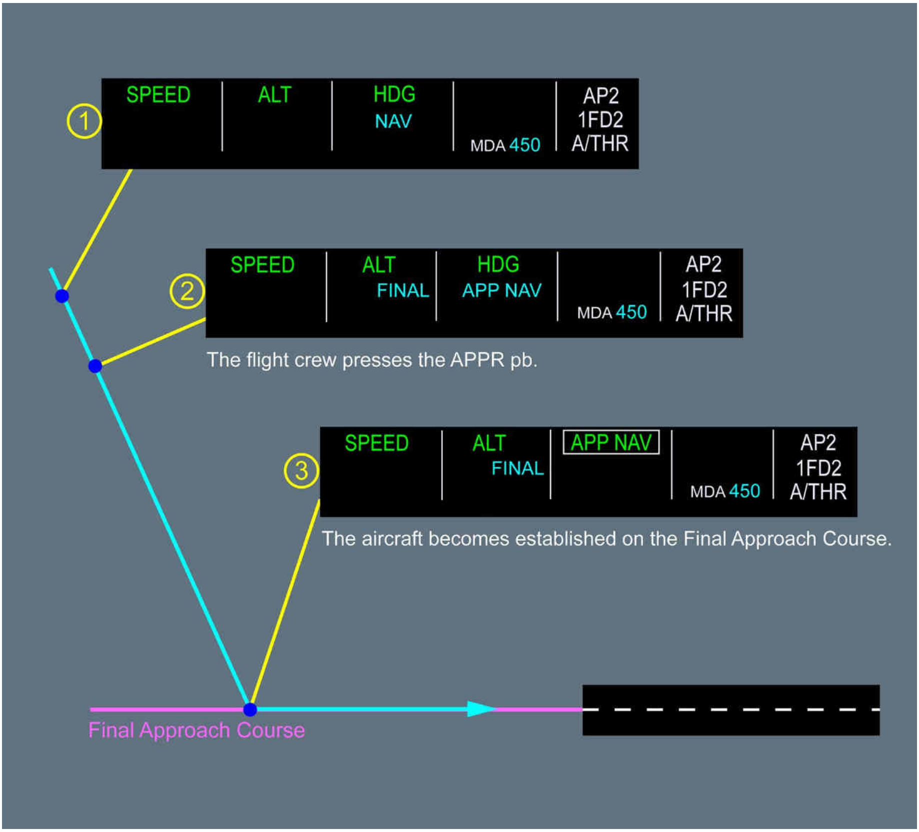
The aircraft touches down.

VOR APPROACH FLOWN WITH FINAL APP GUIDANCE MODE

Ident.: DSC-22_30-40-120-80-00025785.0001001 / 18 MAY 22
Applicable to: ALL

The flight crew selected a VOR approach on the ARRIVAL page. The FMS approach phase is activated.
AP2 is engaged, and a heading is selected to fly toward the Final Approach Course.

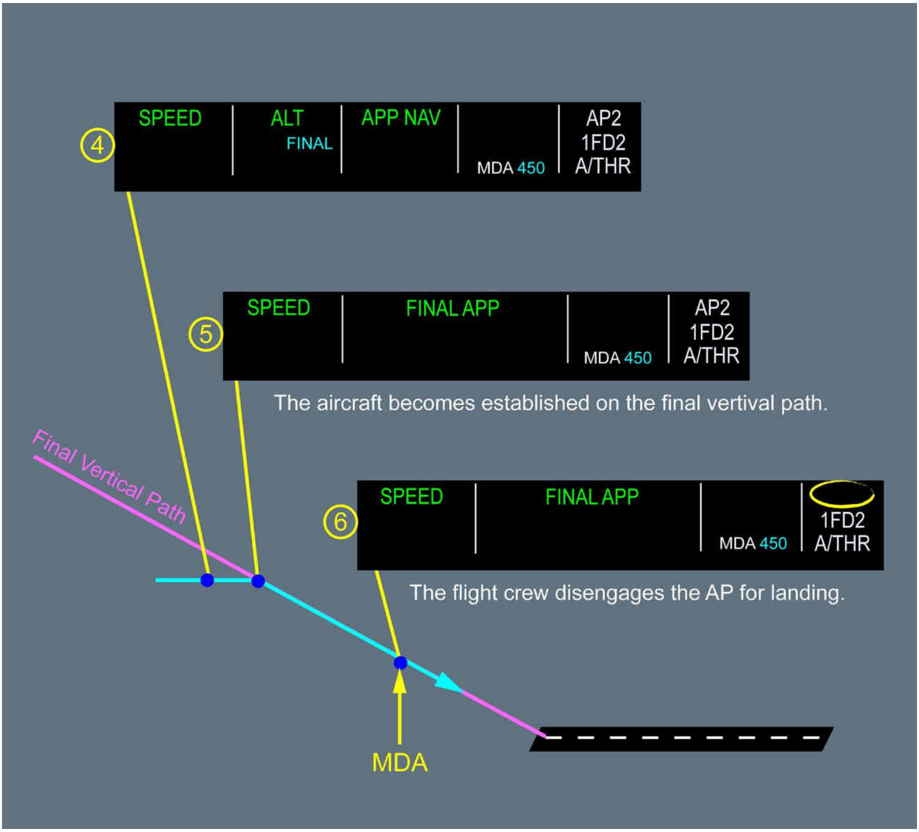
VOR Approach Flown with FINAL APP Guidance Mode - Step 1 to 3


①
SPEED
ALT
HDG
NAV
MDA 450
AP2
1FD2
A/THR
②
SPEED
ALT
FINAL
HDG
APP NAV
MDA 450
AP2
1FD2
A/THR
③
SPEED
ALT
FINAL
APP NAV
MDA 450
AP2
1FD2
A/THR
Final Approach Course

The flight crew presses the APPR pb.

The aircraft becomes established on the Final Approach Course.

VOR Approach Flown with FINAL APP Guidance Mode - Step 4 to 6


④
SPEED
ALT
FINAL
APP NAV
MDA 450
AP2
1FD2
A/THR
⑤
SPEED
FINAL APP
MDA 450
AP2
1FD2
A/THR
Final Vertical Path
⑥
SPEED
FINAL APP
MDA 450
1FD2
A/THR
MDA

The aircraft becomes established on the final vertival path.

The flight crew disengages the AP for landing.

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GENERAL

Ident.: DSC-22_30-50-10-00025044.0001001 / 18 MAY 22
Applicable to: ALL

The A/THR manages the engine thrust.
The A/THR is either armed, active or disconnected.

When active, two different types of A/THR modes are available:
- The SPEED/MACH mode:
  The A/THR continuously adjusts the thrust in order to maintain a speed/Mach target (e.g. during cruise, and approach).
- The THRUST modes:
  The A/THR controls a fixed thrust, in accordance with the engaged THRUST mode.

The A/THR modes are automatically linked to the AP/FD vertical modes:
- When an AP/FD vertical mode controls the trajectory (e.g. altitude acquire modes, altitude hold modes, V/S / FPA, G/S, F-G/S ◁), the A/THR is in SPEED/MACH mode
- When an AP/FD vertical mode adjusts the aircraft pitch in order to maintain a speed/Mach target (e.g. climb, descent), the A/THR is in THRUST mode.

When the A/THR is active, the A/THR thrust target is sent to the FADECs. The FADECs computes thrust commands, in accordance with the aircraft environment and status. The thrust commands are then sent to the engines.
When the A/THR is armed, the FADECs compute the thrust commands in accordance with the thrust lever positions, and the selection of PERF TAKEOFF page.
When the A/THR is disconnected, the FADECs compute the thrust commands in accordance with the thrust lever positions.

A/THR ARCHITECTURE

Ident.: DSC-22_30-50-10-00025045.0001001 / 18 MAY 22
Applicable to: ALL

The FMGECs independently compute the A/THR commands and only one FMGEC controls the active A/THR, referred to as the master FMGEC.
If one AP is engaged, the A/THR uses the system data associated to the engaged AP. If no AP/FD is engaged or both APs are engaged, FMGEC1 has the priority.

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THRUST LEVERS

Ident.: DSC-22_30-50-20-00025046.0001001 / 18 MAY 22
Applicable to: ALL

The position of the thrust levers determines the A/THR status: active, armed or disconnected.

The thrust levers have:
- Four detents: IDLE, CL, FLX-MCT, TOGA
- Two instinctive disconnect pushbuttons.

The flight crew uses the thrust levers to:
- Arm, activate, or disconnect the A/THR
- Engage the takeoff and go-around modes
- Manually control the thrust of each engine, when the A/THR is disconnected
- Engage reverse thrust.

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PRELIMINARY CONDITIONS REQUIRED FOR A/THR ARMING AND ACTIVATION

Ident.: DSC-22_30-50-30-A-00025047.0001001 / 18 MAY 22
Applicable to: ALL

A/THR can only arm when all of the following are applicable:
- At least one FMGEC is available, and
- At least one FCU channel is available, and
- Two ADIRUs are available, and
- The A/THR is not manually disabled (Instinctive Disconnect pb has not been pressed for more than 15 s), and

Ident.: DSC-22_30-50-30-A-00025061.0001001 / 18 MAY 22
Applicable to: LV-KHT, LV-KHU

- All the engines are operative in the same rating mode: EPR or N1, and
- A maximum of one engine is operative in N1 degraded mode, and

Ident.: DSC-22_30-50-30-A-00025060.0001001 / 18 MAY 22
Applicable to: ALL

- Two FADECs are operative.

A/THR ARMING

Applicable to: ALL

Ident.: DSC-22_30-50-30-B-00025049.0001001 / 18 MAY 22

ARMING CONDITIONS

The A/THR arms, if one of the following occurs:
- At takeoff, the flight crew sets at least one thrust lever:
  - To the TOGA detent, or
  - To the FLX-MCT detent, when a FLX TO temperature or a DRT TO level (Derated Takeoff ◁) is entered in the PERF TAKEOFF page.

  SRS TO engages
- By engaging a go-around (MAN TOGA), the flight crew sets the thrust levers to the TOGA detent: SRS GA engages
- By engaging a Soft Go-Around ◁ (MAN GA SOFT), the flight crew sets the thrust levers to the TOGA detent, then to the FLX/MCT detent: SRS GA engages

- The flight crew presses the A/THR pb on the FCU, when the A/THR is disconnected, provided that all the following occur:
  - The thrust levers are outside of the A/THR active range:
    - ■ Above CL detent (AEO), or
    - ■ Above FLX-MCT detent (OEI).
  - The aircraft is above 100 ft RA, or all RAs are failed
  - LAND or FLARE is not engaged.
- AP/FD TCAS ◁ engages due to a RA, when the A/THR is disconnected and the thrust levers are outside of the A/THR active range.

In addition, A/THR can be armed by a flight crew action on the thrust levers, when the A/THR is active.

Ident.: DSC-22_30-50-30-B-00025050.0001001 / 18 MAY 22

ANNUNCIATION

When the A/THR is armed:

- The A/THR pb light of the FCU is on
- The FMA displays:
  - A/THR on Line 3 of the "AP, FD, and A/THR Engagement Status" column
  - One of the following A/THR modes in the "A/THR messages and modes" column: MAN TOGA, MAN FLX +XX, MAN DTO (Derated Takeoff ◁), MAN GA SOFT ◁ , MAN MCT, or MAN THR

As long as the A/THR is not active, the A/THR messages on the FMA displays the manual thrust as follows:

Conditions		Thrust lever position	FMA Message(1)
From takeoff, and until the thrust reduction altitude	The flight crew performs a takeoff with no FLX TO temperature, or DRT TO level (Derated Takeoff ◁) entered in the PERF TAKEOFF page	TOGA (2) (3)	MAN TOGA
	The flight crew entered a FLX TO temperature in the PERF TAKEOFF page	FLX-MCT (3)	MAN FLX +XX
	The flight crew entered a DRT TO level (Derated Takeoff ◁) in the PERF TAKEOFF page	FLX-MCT (3)	MAN DTO

Continued on the following page

Continued from the previous page

Conditions		Thrust lever position	FMA Message(1)
In descent, or approach	The flight crew performs a go-around	TOGA (3) (4)	MAN TOGA
	The flight crew performs a soft go-around ◁✱	TOGA then FLX-MCT (3) (4)	MAN GA SOFT

(1) *The FMA message appears in a white box, on Line 1 and 2 of the "A/THR messages and modes" column.*

(2) *If the flight crew sets the thrust levers to FLX-MCT, MAN MCT will appear on FMA.*

(3) *If the flight crew sets the thrust levers between CL and TOGA, but not at the CL, FLX-MCT, or TOGA detent, MAN THR will appear on FMA.*

(4) *If the flight crew sets the thrust levers directly to FLX-MCT and not TOGA then FLX-MCT, the MAN THR will appear on the FMA.*

A/THR ACTIVATION

Applicable to: ALL

Ident.: DSC-22_30-50-30-C-00025051.0001001 / 18 MAY 22

GENERAL

When active, the A/THR controls:
- The thrust, when an A/THR THRUST mode is engaged, or
- The speed/Mach, when the A/THR SPEED/MACH mode is engaged.

The thrust lever positions determine the maximum thrust that the A/THR can command (except in A.FLOOR).

The normal position of the thrust levers is with A/THR active is:
- The CL detent (AEO)
- The FLX-MCT detent for the operative engine (OEI).

Note: *The thrust lever of a failed engine should be in the IDLE detent.*

Ident.: DSC-22_30-50-30-C-00025052.0001001 / 18 MAY 22

ACTIVATION CONDITIONS

The A/THR activates, if one of the following occurs:

- The A/THR is armed, and the flight crew sets the thrust levers in the active range:

L12

Engine Condition	Active Range
AEO	Both thrust levers are above idle, and at or below the CL detent. The A/THR also activates when: - One thrust lever is above the idle detent, and at or below the CL detent, and - The other thrust lever is • At the idle detent, or • Above the CL detent, and at or below the FLX-MCT detent. Note: *In the case of takeoff with a FLX TO temperature or a DRT TO level (Derated Takeoff ◁) entered in the PERF TAKEOFF page, the thrust lever must be below the FLX-MCT detent.*
OEI(1)	One thrust levers is above the idle detent, and at or below FLX-MCT detent. If the engine-out occurs during a FLX TO or a DRT TO (Derated Takeoff ◁), the flight crew activates the A/THR by: 1. Setting the thrust lever of the operative engine below FLX-MCT, 2. Then, settings the thrust lever of the operative engines back to FLX-MCT.

(1) The thrust lever of the failed engine should be at the idle detent.

- The flight crew presses the A/THR pb on the FCU when the A/THR is disconnected, provided that:
  - The thrust levers are in the active range
  - L2 The aircraft is above 100 ft RA, or all RAs are failed
  - LAND or FLARE is not engaged.
- L1 A.FLOOR engages

  Note: *A.FLOOR engages regardless of the initial A/THR status, and the position of the thrust levers.*

- AP/FD TCAS ◁ engages, upon a RA, when the A/THR is disconnected and the thrust levers are in the active range.

Ident.: DSC-22_30-50-30-C-00025053.0001001 / 18 MAY 22

ANNUNCIATION

When the A/THR is active:

- The A/THR pb light is illuminated on the FCU
- The EWD displays the thrust target
- The FMA displays:
  - A/THR on Line 3 of the "AP, FD, and A/THR Engagement Status" column
  - A/THR mode on Line 1 of the "A/THR messages and modes" column.

Ident.: DSC-22_30-50-30-C-00025054.0001001 / 18 MAY 22

EFFECT OF THRUST LEVER MOVEMENT WHEN THE A/THR IS ACTIVE

A/THR TRANSITION FROM ACTIVE TO ARMED

When the A/THR is active, the A/THR becomes armed as described in the following table:

L12

Engine Condition	Thrust Lever Position
AEO	All the thrust levers are above the CL detent. Or at least one thrust lever is above the FLX-MCT detent.
OEI	The thrust lever of the operative engine is above the FLX-MCT detent.

When the A/THR becomes armed, the thrust immediately increases in accordance with the thrust lever position (above CL detent (AEO) or above FLX-MCT detent (OEI)).
The FMA displays MAN THR on Line 1 of the "A/THR Modes and Messages" column.

A/THR LIMITED

The A/THR limits the engine thrust at the thrust levers position when:

- All the thrust levers are set below the CL detent (AEO), or
- The thrust lever of all operative engines are set below FLX-MCT detent (OEI).

When the thrust is limited, the AUTO FLT A/THR LIMITED alert triggers.
L2 The AUTO FLT A/THR LIMITED alert is repeated every 5 s, until the flight crew moves the thrust levers to the CL detent (AEO) or FLX-MCT detent (OEI).
L1 The FMA displays THR LVR on Line 1 of the "A/THR Modes and Messages" column.
LVR CLB or LVR MCT flashes on Line 3 of the "A/THR Modes and Messages" column of the FMA.
This reminds the flight crew that the normal position of the thrust levers, when A/THR is active, is the CL detent (AEO) or the FLX-MCT detent (OEI).

L2 LVR CLB flashes on the FMA, when all the following conditions are applicable:
- All engines are operative (AEO)
- The position of the thrust levers are not appropriate:
  - Both thrust levers are below the CL detent, or
  - One thrust lever is above CL detent.
- The aircraft is above 100 ft RA
- No windshear is detected.

LVR MCT flashes on the FMA, when all the following conditions are applicable:
- One engine is inoperative (OEI)
- The position of the thrust lever of the operative engines is not appropriate:
  - The thrust lever is below the FLX-MCT detent, or
  - The aircraft is above the thrust reduction altitude, and the thrust lever is above FLX-MCT.
- The aircraft is above 100 ft RA
- No windshear is detected.

L1 ASYMMETRIC THRUST LEVERS

LVR ASYM flashes on the FMA if all the following conditions are satisfied:
- The A/THR is armed or active, and
- At least one thrust lever is set to CL detent or FLX-MCT detent , and
- One thrust lever is not in the same position, and
- L2 The aircraft is above 100 ft RA.

L1 *Note:* ***LVR ASYM*** *flashes until the flight crew sets all thrust levers to the CL detent or the FLX-MCT detent.*
LVR ASYM *will not be displayed in the case of OEI or if the flight crew sets one thrust lever to the IDLE detent.*

A/THR DISCONNECTION

Applicable to: ALL

Ident.: DSC-22_30-50-40-A-00025055.0001001 / 18 MAY 22

GENERAL

STANDARD DISCONNECTION

The A/THR disconnects if one of the following occurs:

- The flight crew presses an A/THR instinctive disconnect pb, or

  Note: *In normal operation, if the flight crew presses the A/THR instinctive disconnect pb, the engine thrust target is set to the thrust lever position.*

- The flight crew sets all the thrust levers to the IDLE detent.

NON-STANDARD DISCONNECTION

The A/THR disconnects if one of the following occurs:

- The flight crew presses the A/THR pb on the FCU.
- The A/THR becomes inoperative.

L2 One of the preliminary conditions required for A/THR arming or activation is no longer applicable. .

L1 L2 For more information on how to the set the autothrust to off, *Refer to FCTM/AS-FG-10-2 To set Autothrust to Off*.

L1

CAUTION	If the flight crew presses, and holds one A/THR instinctive disconnect pb for more than 15 s, the A/THR will disconnect for the remainder of the flight. All A/THR modes, including A.FLOOR, will be lost. The A/THR will be recovered at the next FMGEC power-up on the ground.

Ident.: DSC-22_30-50-40-A-00025056.0001001 / 18 MAY 22

THRUST LOCK FUNCTION

The thrust lock function activates if an A/THR non-standard disconnection occurs.

As long as the thrust lock function is active, all the following are applicable:

- The engines maintain the thrust at the value set before the A/THR disconnection
- The FMA displays the flashing THR LK message on Line 3of the "A/THR modes and Messages" column
- The ECAM alert ENG THRUST LOCKED appears every 5 s.

The thrust lock deactivates as soon as the flight crew moves the thrust levers.

A/THR ANNUNCIATION AND WARNINGS

Applicable to: ALL

Ident.: DSC-22_30-50-40-B-00025057.0001001 / 03 NOV 23

STANDARD DISCONNECTION

In the case of a standard disconnection (*Refer to DSC-22_30-50-40 A/THR Disconnection*), all the following occur:

- The Memo amber message A/THR OFF appears
  L2 The maximum duration is 9 s
- L1 The MASTER CAUT light comes on
  L2 The maximum duration is 3 s
- L1 The single chime sounds.

The flight crew can press the A/THR instinctive disconnect pb, or the MASTER CAUT light to clear all the associated indicators.

Note: *If the aircraft is below 50 ft RA, and the flight crew sets all thrust levers to IDLE, no alert appears.*

Ident.: DSC-22_30-50-40-B-00025058.0001001 / 18 MAY 22

NON-STANDARD DISCONNECTION

In the case of a non-standard disconnection (*Refer to DSC-22_30-50-40 A/THR Disconnection*), all the following occur:

- The AUTO FLT A/THR OFF alert appears
- The MASTER CAUT light comes on
- The single chime sounds.

The alerts disappear if the flight crew:

- Presses the A/THR instinctive disconnect pb, or
- Presses the MASTER CAUT pb, or
- Arms or activates the A/THR.

GENERAL

Ident.: DSC-22_30-50-50-00025059.0001001 / 18 MAY 22
Applicable to: ALL

When the A/THR is active, an A/THR mode is engaged.
The A/THR modes are: THRUST, SPEED/MACH, RETARD and ALPHA FLOOR.

THRUST MODE

Ident.: DSC-22_30-50-50-00025065.0001001 / 18 MAY 22
Applicable to: ALL

The A/THR is in THRUST mode if the engaged vertical AP/FD modes is SRS TO, OP CLB, CLB, OP DES, DES, or SRS GA in idle path. The target thrust depends on the engaged THRUST mode and can be limited by the thrust lever position, if the thrust levers are below the CL detent (AEO) or the FLX-MCT detent (OEI).
The following table shows the engagement conditions of the THRUST mode with the associated target thrust :

THRUST mode (Displayed on FMA)	Engagement Conditions (1)	Target Thrust
THR CLB	All of the following conditions are applicable: - SRS TO, CLB, OP CLB, or SRS GA is engaged, and - The most forward thrust lever is set to CL detent, and - The derated CLB is not selected on the FMS PERF TAKEOFF page.	CLB
THR DCLB 1(2) ◁	All of the following conditions are applicable: - SRS TO, CLB, OP CLB, or SRS GA is engaged, and - The most forward thrust lever is set to CL detent, and - The derated CLB is selected on the FMS PERF TAKEOFF page.	Derated Climb ◁
THR MCT	All of the following conditions are applicable: - SRS TO, CLB, OP CLB, or SRS GA is engaged, and - The most forward thrust lever is set to MCT detent, and - One engine is inoperative.	MCT
THR IDLE	DES, OP DES, or the A/THR RETARD mode is engaged.	IDLE

Continued on the following page

Continued from the previous page

THRUST mode (Displayed on FMA)	Engagement Conditions [(1)]	Target Thrust
THR DES	All of the following conditions are applicable: - DES is engaged in idle path, and - The FMS requests a thrust slightly higher than the idle thrust.	Slightly higher than IDLE
THR LVR	One of the following conditions is applicable: - All thrust levers are below CL detent, and SRS TO, CLB, OP CLB, or SRS GA is engaged, or - The most forward thrust lever is between CL and MCT detents, and SRS TO, CLB, OP CLB, or SRS GA is engaged	Thrust corresponding to thrust levers position

(1) *The thrust lever position refers to the thrust lever of operative engines. The thrust lever of an inoperative engine should be at the IDLE detent.*

SPEED/MACH MODE

Applicable to: ALL

Ident.: DSC-22_30-50-50-A-00025066.0001001 / 18 MAY 22

The SPEED or MACH mode of the A/THR adjusts the thrust to acquire and maintain a target speed or Mach.

The A/THR is in SPEED or MACH mode if one of the following AP/FD vertical modes is engaged:
- V/S / FPA, or
- Altitude capture and hold modes: ALT*, ALT, ALT CST*, ALT CST, ALT CRZ*, ALT CRZ, or
- DES in geometric path, or
- Approach modes: G/S*, G/S, F-G/S* ◁ , F-G/S ◁ , FINAL APP, or
- AP/FD TCAS ◁ .

If all APs and all FDs are disengaged and the A/THR is active, the A/THR is in SPEED/MACH mode.

Ident.: DSC-22_30-50-50-A-00025067.0001001 / 18 MAY 22

The speed/Mach target is:
- **Selected** if the target comes from the SPD/MACH value that the flight crew selects on the FCU
- **Managed** if the target comes from the FMS.

When in SPEED or MACH mode, the A/THR does not allow speed excursions beyond the following limits, regardless of the target speed or Mach number:
- As a maximum speed VMAX in high lift configuration, VMAX - 5 kt in clean configuration
- As a minimum speed:
  - For a selected speed target, VLS
  - For a managed speed target, the maneuvering speed of the current slats/flaps configuration (VAPP, F, S, GD).

Ident.: DSC-22_30-50-50-A-00025069.0001001 / 18 MAY 22

Note: *The changeover from SPEED to MACH or vice versa can be done automatically by the FMGEC or manually by the flight crew by pressing the SPD/MACH pb on the FCU.*

Ident.: DSC-22_30-50-50-A-00025070.0001001 / 04 MAY 23

A/THR SOFT MODE

FUNCTION

The purpose of the A/THR SOFT Mode is to reduce thrust variations, specifically in light turbulence. This mode permits slight variations of the speed/Mach.

ACTIVATION

The A/THR SOFT Mode activates if all the following conditions are applicable:
- The A/THR is active in SPEED or MACH mode
- The current speed is within a range of ± 3 kt of the target speed
- The AP is engaged in ALT CRZ mode
- The speed brakes are retracted
- All engines are operative
- The Mach target is above 0.65.

Note: *No message indicates that the A/THR soft mode is active.*

DEACTIVATION

The A/THR SOFT Mode deactivates if one of the following conditions is applicable:
- The aircraft speed significantly deviates from the target, or
- The aircraft speed goes above VMAX, or
- The flight crew changes the target speed.

Note: *The transition from A/THR SOFT Mode to A/THR normal mode may lead to transient thrust variations.*

Ident.: DSC-22_30-50-50-A-00025068.0001001 / 18 MAY 22

A/THR APPROACH MODE

Below 150 ft RA, the A/THR behavior is optimized to be less responsive to speed variations. This logic exists to avoid large thrust increases during the lower segment of the approach that may lead to destabilization and possible long flare.

RETARD MODE

Ident.: DSC-22_30-50-50-00025072.0001001 / 18 MAY 22
Applicable to: ALL

The A/THR RETARD mode is only available during an automatic landing.

The RETARD mode engagement occurs as follows:
1. At least one AP is engaged. LAND and A/THR SPEED mode are engaged
2. FLARE engages
3. When the aircraft reaches approximately 50 ft RA, the A/THR RETARD mode automatically engages. The FMA displays THR IDLE and the A/THR sets the thrust to idle
4. A RETARD callout triggers at 10 ft RA, asking the flight crew to set the thrust levers to the IDLE detent
5. The flight crew sets the thrust levers to IDLE detent: The A/THR disconnects, and the RETARD mode disengages.

If the last AP disengages when RETARD is engaged, RETARD disengages, and SPEED engages.

Note: *In manual landing, the RETARD callout triggers at 20 ft RA.*

In manual or automatic landing, the RETARD callout triggers, independently of the thrust levers position (*Refer to DSC-22_30-40-120-80 ILS Approach and Autoland*).

A/THR MODE REVERSIONS

Ident.: DSC-22_30-50-50-00025033.0001001 / 18 MAY 22
Applicable to: ALL

The following table presents the A/THR mode reversions:

Initial A/THR Mode	**A/THR Mode after Reversion**	**Conditions Leading to A/THR Mode Reversion**	**Warning**
THRUST	SPEED/MACH	The aircraft does not follow the speed target: - The aircraft speed is below VLS - 2 kt when DES or OP DES is engaged, or - The aircraft speed is above VMAX + 4 kt when CLB or OP CLB is engaged. *Note:* *If the FD is engaged, the FD also disengages*	A triple click audio indicator sounds. If the aircraft speed goes above VMAX + 4 kt, the OVERSPEED alert triggers.
Whatever A/THR mode. The A/THR can be armed, active, or disconnected.	A.FLOOR	*Refer to DSC-27-20-10-20 Protections - High Angle of Attack Protection*	*Refer to DSC-22_30-50-50 ALPHA FLOOR*

ALPHA FLOOR

Applicable to: ALL

Ident.: DSC-22_30-50-50-B-00025073.0001001 / 18 MAY 22

ALPHA FLOOR avoids flying at low speed with a low thrust. ALPHA FLOOR automatically applies TOGA thrust if the aircraft angle of attack exceeds the ALPHA FLOOR threshold (between αprot and αmax) that depends on the aircraft configuration.
For more information on ALPHA FLOOR threshold, *Refer to DSC-27-20-10-20 Protections - General*.

Note: *A.FLOOR is activated through the autothrust system, when:*

- *α is greater than a threshold depending on the aircraft configuration, the ground speed variation, and the difference between ground speed and air speed, or*
- *Sidestick deflection above 14 ° and the:*
  - *Pitch attitude is greater than 25 °, or*
  - *AOA protection active.*

If A.FLOOR activates, all the following events occur:

1. The A/THR automatically activates, independently of the previous A/THR engagement status
2. The A.FLOOR mode of the A/THR engages
3. The A/THR commands TOGA thrust, regardless of the thrust lever positions
4. The FMA displays A.FLOOR with a flashing amber box on Line 1 of the "A/THR Messages and Modes" column
5. The EWD displays A.FLOOR

If the aircraft leaves the ALPHA FLOOR conditions, the FMA displays TOGA LK with a flashing amber box on the first line of the first column. This indicates that the TOGA thrust is maintained.

CAUTION	The A.FLOOR mode will disconnect, if the flight crew manually disconnects the A/THR.

ALPHA FLOOR is available from the lift-off to 100 ft RA in approach if the A/THR is available.

Ident.: DSC-22_30-50-50-B-00025074.0001001 / 18 MAY 22

ALPHA FLOOR is inhibited if one of the following is applicable:

- A/THR is failed, or
- The aircraft altitude is below 100 ft during landing, or
- The aircraft speed is above M 0.53,or
- One engine is failed with the flaps extended or with Derated Takeoff ◁ selected, or
- AP/FD TCAS ◁ mode engages (*Refer to DSC-22_30-40-100 Normal Operations - When a RA is triggered - Consequence on ALPHA FLOOR*).

Ident.: DSC-22_30-50-50-B-00025075.0001001 / 18 MAY 22

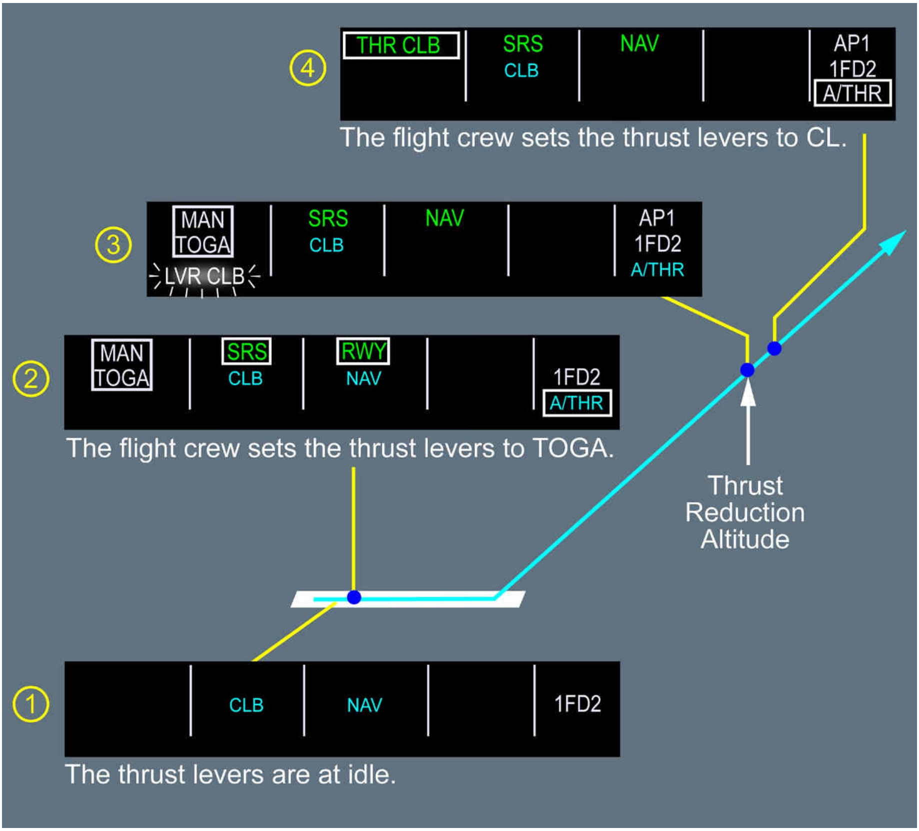
CAUTION	The system may consider an engine as failed if the corresponding Thrust Lever Angle (TLA) is below 5° and another TLA is above 5°. The system may therefore inhibit ALPHA FLOOR. In manual thrust control, the flight crew should check that all the thrust levers are correctly aligned above 5° to avoid an undue inhibition of ALPHA FLOOR.

FROM TAKEOFF TO THRUST REDUCTION ALTITUDE

Ident.: DSC-22_30-50-60-00025743.0001001 / 18 MAY 22
Applicable to: ALL

The aircraft is on ground, and the flight crew performs a takeoff with no selected FLX TO temperature, or DRT TO level (Derated Takeoff ◁) in the PERF TAKEOFF page:

1. The thrust levers are in the IDLE detent
2. The flight crew sets the thrust levers to TOGA:
    - A/THR arms
    - The engines thrust increases to TOGA
    - MAN TOGA appears on the FMA
    - SRS TO engages.
3. When the aircraft reaches the thrust reduction altitude, LVR CLB flashes
4. The flight crew sets the thrust levers to the CL detent:
    - A/THR activates
    - THR CLB appears on the FMA.


④
THR CLB
SRS
CLB
NAV
AP1
1FD2
A/THR
The flight crew sets the thrust levers to CL.
③
MAN
TOGA
LVR CLB
SRS
CLB
NAV
AP1
1FD2
A/THR
②
MAN
TOGA
SRS
CLB
RWY
NAV
1FD2
A/THR
The flight crew sets the thrust levers to TOGA.
Thrust
Reduction
Altitude
①
CLB
NAV
1FD2
The thrust levers are at idle.

GENERAL

Ident.: DSC-22_30-60-10-00019300.0001001 / 18 MAY 22
Applicable to: ALL

The speed/Mach control is:
- Managed, when the target comes from the FMS
- Selected, when the target comes from the SPD/MACH FCU window.

In flight, either the AP/FD pitch control or the A/THR may acquire and hold a target speed or Mach number, according to the engaged modes.

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GENERAL

Ident.: DSC-22_30-60-20-00019301.0001001 / 18 MAY 22
Applicable to: ALL

When the speed target is managed, the SPD/MACH window of the FCU shows dashes, and the corresponding dot is lighted. The PFD speed scale shows the speed target in magenta.
For more information on the Speed/Mach Control Area, *Refer to DSC-22_10-40-20 Speed/Mach Control Area*.
For more information on the PFD Airspeed Indications, *Refer to DSC-31-40 Airspeed*.

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-20-00025778.0001001 / 18 MAY 22
Applicable to: ALL

The SPD target is managed whenever AP or FD is engaged and one of the following occurs:
- On ground, when V2 is inserted in the PERF TAKEOFF page, or

  Note: At takeoff, SRS TO will not engage if V2 is not available.

- The SRS TO or SRS GA is engaged, or
- The flight crew pushes the SPD/MACH knob on the FCU, and a managed speed/Mach target is available, or
- The AP/FD TCAS ◁ mode is engaged.

Note:
1. *If all the APs and FDs are off, the managed speed/Mach is only available when the flight phase of the FMS is the approach phase. The A/THR is then in SPEED mode.*
2. *The flight crew may insert a speed/Mach in the PERF DES page to replace the ECON DES SPD.*
   In this case, although the value is entered by the flight crew, this speed target is still managed and is taken into account to compute the top of descent and the descent profile.

MANAGED SPEED/MACH TARGET

Applicable to: ALL

Ident.: DSC-22_30-60-20-A-00025062.0001001 / 18 MAY 22

For managed speed/Mach, the lowest target is VLS, and the highest target is:
- VMAX in the case VMAX is equal to VFE, or
- VMAX - 5 kt in the case VMAX is equal to VMO/MMO.

When speed/Mach is managed, the target is defined as follows:

AP/FD Engaged Mode or FMS Flight Phase	Managed Speed/Mach Target
SRS TO is engaged, and the aircraft is on ground.	V2
SRS TO is engaged, and the aircraft is airborne.	V2 + 10 kt *Note:* *However, the magenta triangle appears on the V2 value, on the PFDs.*
SRS TO is engaged, and one engine is out.	Memorized aircraft speed at engine-out detection. The target value is limited by V2 and V2 + 15 kt.
SRS GA is engaged.	Memorized aircraft speed at SRS GA engagement. The lower limit of the target is the VAPP memorized at 700 ft RA. The higher limit of the target is the lowest value between: - VLS + 25 kt (or VLS + 15 kt OEI) - VMAX - 5 kt.
- The FMS flight phase is the approach phase In this case, the APs and/or FDs may be on or off Or - F-G/S ◁ , G/S, LAND, FLARE or ROLL OUT is engaged	VAPP, corrected by the Ground Speed Mini function (*Refer to DSC-22_30-60-20 Ground Speed Mini Function*). Before reaching the landing configuration, the speed will not go below: - Green Dot, in clean configuration - S, in CONF 1 - F, in CONF 2 - F, in CONF 3, when CONF FULL is the landing configuration (as defined in the PERF APPR page). VAPP is memorized at 700 ft RA, so if the FMS loses the VAPP below 700 ft RA, the managed speed target will still be computed. The lower limit of the managed speed target is the VAPP that is computed by the FMS, and displayed on the MCDU. If the VAPP computed by the FMS is not available, the VAPP is VLS + 5 kt. The higher limit of the managed speed target is the VFE NEXT (or VFE - 5 kt in full configuration) of the landing configuration.
For all other cases	The managed speed/Mach target is provided by the FMS: - If NAV is engaged, the managed speed/Mach target will be defined by the speed/Mach profile of the FMS flight plan. All the speed/Mach constraints are taken into account. - If NAV is not engaged, the managed speed/Mach target will be defined by the speed/Mach profile of the FMS flight plan. But the speed/Mach constraints are not taken into account. For information on the speed/Mach profile, *Refer to DSC-22_20-30-20-05 Flight Phases*.

Ident.: DSC-22_30-60-20-A-00019305.0001001 / 18 MAY 22

MANAGED SPEED TARGET MEMORIZATION

A dual FM failure has different consequences when it occurs in different phases of the flight.

The system handles target speed and SPD mode as follows:
- During approach with LOC and G/S, or F-LOC ◁ and F-G/S ◁ , or LOC and F-G/S ◁ , or LOC B/C and F-G/S ◁ engaged, and radio height <700 ft, the target speed is set to VAPP as previously memorized, and managed SPD target is maintained
- At go-around, the target speed becomes the memorized go-around speed, which is the higher of VAPP or the speed when go-around was initiated. Managed SPD target is maintained
- In all other cases, managed target speed reverts to selected, the value being the speed at the moment of the failure.

GROUND SPEED MINI FUNCTION

Applicable to: ALL

Ident.: DSC-22_30-60-20-B-00019830.0001001 / 18 MAY 22

GENERAL

When the aircraft flies an approach in managed speed, the managed speed target, displayed by the magenta triangle on the PFDs, is variable. This managed speed target is the VAPP, displayed on the PERF APPR page, corrected by the Ground Speed Mini function.

ACTIVATION CONDITIONS

The Ground Speed Mini function is active when:

- The speed is managed
- The FMS flight phase is the approach phase.

The Ground Speed Mini function does not correct Green Dot, S and F speeds.

PRINCIPLE

The Ground Speed Mini function takes advantage of the aircraft inertia when the wind varies during the approach in order to provide an appropriate indicated target speed (i.e. the managed target speed represented by the magenta triangle on the PFD). When the flight crew flies this indicated target speed, the energy of the aircraft is maintained above a minimum level that ensures standard aerodynamic margins versus the stall.
The minimum energy level is the energy level the aircraft will have at touchdown with an indicated airspeed equal to VAPP, and with the wind equal to the tower reported wind as inserted in the PERF APPR page. The ground speed then equals the Ground Speed Mini.
The Ground Speed Mini is not displayed to the flight crew.

During the approach, the FMGES continuously computes the managed target speed in order to keep the ground speed at or above the Ground Speed Mini.

Ident.: DSC-22_30-60-20-B-00019831.0001001 / 18 MAY 22

MANAGED SPEED TARGET COMPUTATION

The computation of the managed speed target uses the tower headwind component, the current headwind component, and the VAPP.

TOWER HEADWIND COMPONENT

The tower wind is the average wind provided by the ATIS or the tower. The flight crew enters the tower wind in the MAG WIND field in the PERF APPR page.
The tower headwind component is the projection of the MAG WIND on the runway axis. This computation is based on the runway inserted in the FMS active F-PLN.

CURRENT HEADWIND COMPONENT

The projection of the current wind measured by the ADIRS on the aircraft longitudinal axis is the current headwind component (instantaneous headwind).

Ident.: DSC-22_30-60-20-B-00019974.0001001 / 18 MAY 22

VAPP COMPUTATION

The FMS computes the VAPP, and displays it on the PERF APPR page. The VAPP computation takes into account the tower headwind component. VAPP is the highest of the following computations:
- VAPP = VLS + 1/3 x TWR HEADWIND COMPONENT, or
- VAPP = VLS + 5 kt.

Note: *“1/3 of the TWR HEADWIND COMPONENT” has 2 limits:*

- *0 kt as the minimum value (no wind or tailwind)*
- *+15 kt as the maximum value.*

The flight crew can manually modify the VAPP and the MAG WIND values on the PERF APPR page.

Ident.: DSC-22_30-60-20-B-00025780.0001001 / 04 MAY 23

MANAGED SPEED TARGET COMPUTATION

The FG continuously computes the managed speed target that is equal to VAPP plus an additional increment. This increment takes into account the headwind variation during the final approach.

The managed speed target is computed as follows:
- Above 400 ft RA:
  Managed speed target =VAPP + (CURRENT HEADWIND COMPONENT - TWR HEADWIND COMPONENT).
- Below 400 ft RA:
  Managed speed target = VAPP + K x (CURRENT HEADWIND COMPONENT - TWR HEADWIND COMPONENT)
  "K" factor reduces from 1 to 0.33 in 25s.

The managed speed target has the following limits:
- VAPP, as the minimum value
- VFE next, in CONF 0, 1, 2, 3, VFE - 5 kt in CONF FULL, as the maximum value.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-20-00025779.0001001 / 18 MAY 22
Applicable to: ALL

Managed speed disengages any time the flight crew selects a speed target on the FCU, or if the speed was preselected.

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GENERAL

Ident.: DSC-22_30-60-30-00019302.0001001 / 18 MAY 22
Applicable to: ALL

When the speed target is selected, the SPD/MACH window of the FCU displays this speed target. The PFD displays the associated speed target on the airspeed scale. The flight crew uses the knob on the FCU to set this speed target.
For more information on the Speed/Mach Control Area, *Refer to DSC-22_10-40-20 Speed/Mach Control Area*.
For more information on the PFD Airspeed Indications, *Refer to DSC-31-40 Airspeed*.

Note: *If the selected speed/Mach target is set below VLS or above VMAX, with the autothrust active, the FMGES automatically limits the speed to:*
- *VLS, or*
- *VMAX in the case VMAX is equal to VFE, or*
- *VMAX - 5 kt in the case VMAX is equal to VMO/MMO*

Selected speed has priority over managed speed. The only automatic change-over from selected to managed speed target may occur at go-around mode engagement.
In flight, if the situation calls for managed speed, both the PFD and the MCDU display a message proposing a manual change to managed speed (for example SET MANAGED SPEED, CHECK SPEED MODE, SET HOLD SPEED).

ENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-30-00025781.0001001 / 18 MAY 22
Applicable to: ALL

The speed/Mach target becomes selected, if one of the following occurs:
- The flight crew pulls out the SPD/MACH knob (earliest 5 s after lift-off), or
- Both AP/FDs are OFF (except in APPR phase), or
- The FM speed target is lost except below 700 ft RA in takeoff, LAND or go-around mode, or
- The MCDU has a preselected speed for the next phase, and the aircraft transitions into that phase, or
- The FMGEC is powered up in flight, or
- 5 s after lift off when a takeoff is initiated without managed speed target, or
- The AP/FD TCAS ◁ mode due to a RA.

DISENGAGEMENT CONDITIONS

Ident.: DSC-22_30-60-30-00025782.0001001 / 18 MAY 22
Applicable to: ALL

The selected speed target disengages when:
- The managed speed target engages, or
- On ground at AP or FD engagement, or
- On ground at engine start.

Note: *It is not possible to activate selected speed mode on ground with engines running and FD ON until after takeoff.*

SPEED/MACH FCU WINDOW SYNCHRONIZATION

Ident.: DSC-22_30-60-40-00019306.0001001 / 18 MAY 22
Applicable to: ALL

However, the window of the FCU displays the target speed or MACH in the following situations:

- The flight crew turns the SPD/MACH knob.
  The value in the window first synchronizes with the current SPD/MACH, then displays the manual selection. It remains displayed for 45 s depending upon FCU standard, then reverts to dashes if the flight crew does not pull the knob
- The flight crew manually engages a selected SPD target
- If the flight crew has manually preselected that speed or Mach value for the next phase on the PERF page:
  - That preselected speed or Mach value engages when the aircraft enters that phase, and
  - The FCU window then displays this preselected speed or Mach as the target
- If the FMGES is powered up in flight, the synchronized speed/Mach value is the current aircraft speed or Mach
- If no V2 is entered at takeoff, the V/S mode engages 5 s after lift-off (no SRS TO). The FCU speed target is the speed at V/S mode engagement. (A/THR becomes active when the thrust levers are set in the active range)
- If both FMGECs fail, the displayed speed is the last aircraft speed acquired before the failure.

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SPEED/MACH SWITCHING

Ident.: DSC-22_30-60-50-00019304.0001001 / 18 MAY 22
Applicable to: ALL

Speed/Mach switching can be automatic, or manual.
The speed/Mach target (selected or managed) is displayed on the FCU.
The flight crew may check the speed/Mach target computed by the FMS at the crossover altitude in the PERF page.

AUTOMATIC SWITCHING

During climb, at the crossover altitude, the managed speed target automatically changes to the associated Mach target.
During descent, at the crossover altitude, the managed Mach target automatically changes to the associated speed target.

Note: *The flight crew may enter a speed target in the PERF CLB page, or a speed/Mach target in the PERF DES page. Even if it has been entered by the flight crew, this entry is still considered as a managed speed.*

MANUAL SWITCHING

When the speed/Mach mode is selected, the flight crew has to perform the switching, by pressing the SPD/MACH pb on the FCU (*Refer to DSC-22_10-40-20 Speed/Mach Control Area*).

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GENERAL

Applicable to: ALL

Ident.: DSC-22_30-70-A-00022155.0001001 / 18 MAY 22

The approach and landing capability provides the flight crew with the aircraft capability to perform an approach, and land the aircraft.
The FMA displays this capability.

The approach and landing capability depends on:
- The availability of aircraft systems,
- The type of approach selected on the ARRIVAL page.

For more information about the minimum required equipment to compute approach and landing capabilities, *Refer to QRH/OPS Required Equipment for CAT2 and CAT3*.

The approach and landing capability enables the flight crew to determine:
- The available minima of the approach
- The available landing technique.

Ident.: DSC-22_30-70-A-00025155.0001001 / 18 MAY 22

APPROACH AND LANDING CAPABILITY WITH ILS/GLS ◁ /SLS ◁

Approach and Landing Capability	Type of Approach Selected	Available FMA Guidance	Lowest Available Minima	Aircraft Landing Capability
CAT3 DUAL	ILS CAT I, II, III	LOC - G/S	Down to CAT III B	Autoland(1)
CAT3 SINGLE	ILS CAT I, II, III	LOC - G/S	Down to CAT III A	Autoland(1)
CAT2	ILS CAT I, II	LOC - G/S	Down to CAT II	Autoland(1)
AUTO LAND	GLS ◁	LOC - G/S	Down to CAT I	Autoland(1)
CAT1	ILS CAT I	LOC - G/S	Down to CAT I	Manual landing
	GLS ◁			
	RNAV(GNSS) with LPV minima (with SLS ◁).		Down to LPV	

(1) *The flight crew shall refer to the QRH to establish the actual landing capability, if some equipments not monitored by the FMGES are inoperative.* *Refer to QRH/OPS Required Equipment for CAT2 and CAT3.*

Note: *No approach and landing capability is displayed on FMA for RNAV(GNSS) with LP minima (with SLS ◁).*

FAIL CONCEPT

Ident.: DSC-22_30-70-00022071.0001001 / 18 MAY 22
Applicable to: ALL

FAIL-OPERATIONAL AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-operational if, in the event of a failure below alert height, the remaining part of the automatic landing system allows the aircraft to complete the approach, flare, and landing.
The CAT3 DUAL approach and landing capability is fail-operational automatic landing system.

Note: *In the event of a failure, the automatic landing system operates as a fail-passive system.*

FAIL-PASSIVE AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition, or deviation of flight path or attitude, but the landing is not completed automatically.

The following approach and landing capabilities are fail-passive automatic landing system.
- CAT3 SINGLE
- CAT2
- CAT1

Note: *With a fail-passive automatic landing system, the flight crew controls the aircraft after a failure.*

DISPLAY

Ident.: DSC-22_30-70-00022072.0001001 / 04 MAY 23
Applicable to: ALL

The approach and landing capability is displayed in the "Approach and Landing Capability" column of the FMA and of the HUD ◁ , when:
- An LS approach is manually or automatically selected on the ARRIVAL page
- The flight crew presses one of the following pushbutton on the FCU:
  - The LS pb, or
  - The LOC pb, or
  - The APPR pb.

The FMAs displays the approach and landing capability in accordance with the state of the aircraft systems, and the flight guidance systems that are engaged.

Note: *No approach and landing capability is displayed when an RNAV (RNP) approach is selected in the FMS.*

L2 If the FMGEC is not able to compute the approach and landing capability, CAT 1 capability is displayed on the FMA, regardless of the FMS flight phase.

L1 APPROACH WITHOUT FLS ◁ FUNCTION

Depending on the approach selected, the CAT 1 approach and landing capability appears as soon as the flight crew presses one of the LS pb.
The computation of the CAT 1, CAT 2, CAT 3 SINGLE or CAT 3 DUAL approach and landing capability depends on the AP engagement. Therefore, when the flight crew presses the APPR pb to arm or engage the final approach mode, and one or both AP(s) is engaged then CAT 1, CAT 2, CAT 3 SINGLE or CAT 3 DUAL approach and landing capability can be displayed (both APs are necessary for CAT 3 DUAL).
However, if the North reference is TRUE, the CAT 1 is the only available capability.

L2 CAT 1, CAT 2, CAT 3 SINGLE or CAT 3 DUAL approach and landing capability is computed only if the aircraft is above 400 ft RA when the flight crew arms the approach modes.

Below 200 ft RA, CAT 3 SINGLE, or CAT 3 DUAL is memorized and remains displayed as long as:
- At least one AP is engaged, and
- LAND, FLARE, or ROLL OUT is engaged.

L1 APPROACH WITH FLS ◁ FUNCTION

If the flight crew selects an approach with the FLS ◁ function, and the active FMS flight phase is CRZ, DES or APPR, the approach and landing capability appears as soon as the flight crew presses the LS pb.

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AUTOLAND WARNING

Ident.: DSC-22_30-80-10-00025236.0003001 / 18 MAY 22
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

The AUTOLAND red lights flash when:
- At least one AP is engaged below 200 ft RA, with LOC and G/S armed, or with LOC, G/S, LAND or FLARE engaged, and the radio altimeter indications differ by more than 15 ft, or
- At least one AP is engaged below 200 ft RA, with LAND or FLARE mode engaged, and one of the following conditions occurs:
  - The last AP disengages, or
  - The aircraft excessively deviates from the ILS beams (See 1), or
  - The ILS signal is lost (See 2), or
  - A long flare (1 000 m with FLARE engaged) is detected, or
  - A too-early flare (FLARE engages less than 2 s after LAND engagement) is detected.

Note: *1. LOC deviation 1/4 dot above 15 ft RA, GLIDE deviation 1 dot above 100 ft RA (LOC or GLIDE scale flashes on the PFD)*
2. LOC signal is lost above 15 ft RA, or GLIDE signal is lost above 100 ft RA (FD bars flash on the PFD, and LAND mode remains engaged).

AUTOLAND WARNING

Ident.: DSC-22_30-80-10-00025236.0002001 / 18 MAY 22
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

The AUTOLAND red lights flash, when the LAND mode is engaged below 200 ft RA, and one of the following conditions occurs:
- The last AP disengages, or
- The aircraft excessively deviates from the ILS beams (See 1), or
- The ILS signal is lost (See 2), or
- Radio altimeter indications differ by more than 15 ft, or
- A long flare (1 000 m with FLARE engaged) is detected, or
- A too-early flare is detected: FLARE engages less than 5 s after LAND engagement.

Note: *1. LOC deviation 1/4 dot above 15 ft RA, GLIDE deviation 1 dot above 100 ft RA (LOC or GLIDE scale flashes on the PFD)*
2. LOC signal is lost above 15 ft RA, or GLIDE signal is lost above 100 ft RA (FD bars flash on the PFD, and LAND mode remains engaged).

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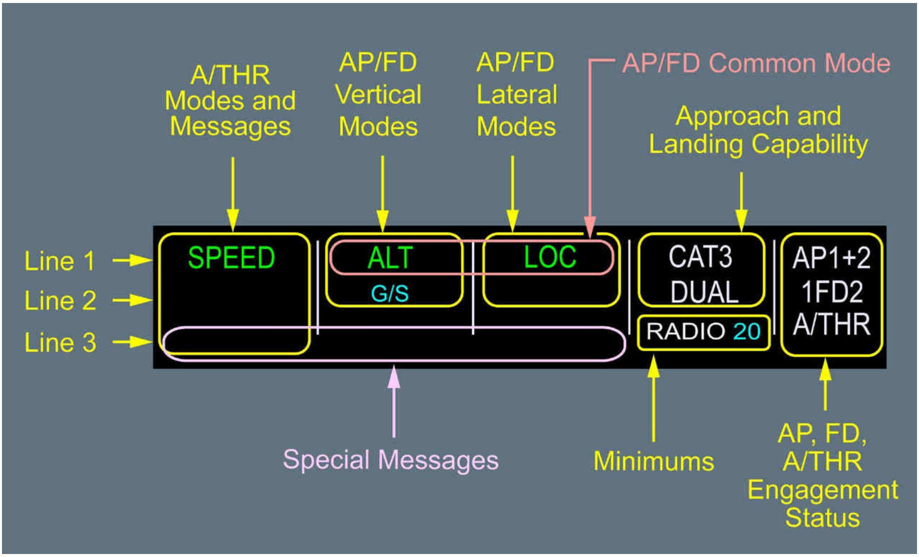
FMA DISPLAY

Ident.: DSC-22_30-80-20-00025513.0001001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The FMA is located on the upper part of the PFD, and displays the following information, associated to flight guidance:

- A/THR messages and modes
- AP/FD modes (Vertical, Lateral, Common)
- Approach and landing capability
- AP, FD, and A/THR engagement status
- Special Messages.


A/THR Modes and Messages
AP/FD Vertical Modes
AP/FD Lateral Modes
AP/FD Common Mode
Approach and Landing Capability
Line 1
Line 2
Line 3
SPEED
ALT
G/S
LOC
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
Special Messages
Minimums
AP, FD, A/THR Engagement Status

A white box appears for 10 s around the annunciation of:

- An A/THR mode engagement
- An AP/FD mode engagement
- The approach and landing capability (or the change of the approach and landing capability)
- An AP, FD, or A/THR engagement status change.

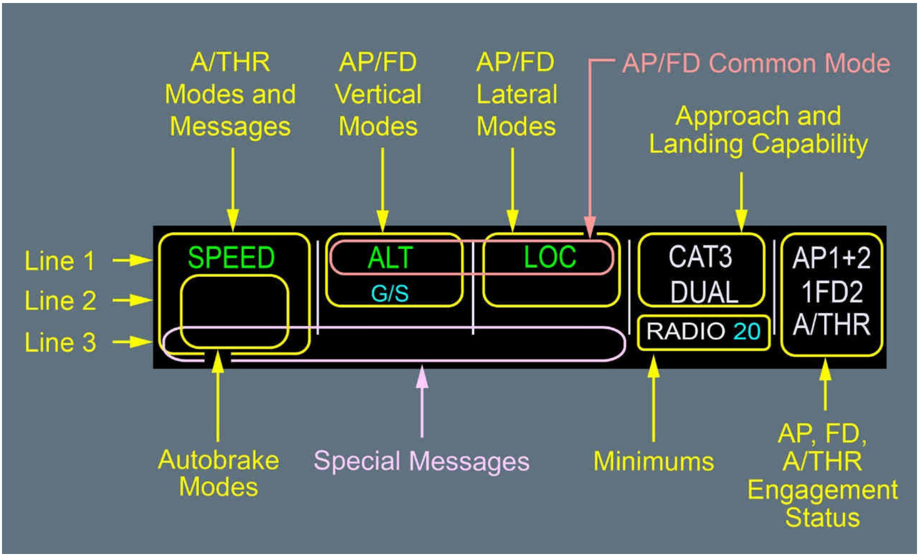
Special Messages displays three types of messages by the following priority:

- First priority is given to F/CTL messages
- Then vertical FMS messages
- Then EFIS reconfiguration messages.

FMA DISPLAY

Ident.: DSC-22_30-80-20-00025513.0008001 / 18 MAY 22
Applicable to: LV-GIF

The FMA is located on the upper part of the PFD, and displays the following information, associated to flight guidance:
- A/THR messages and modes
- AP/FD modes (Vertical, Lateral, Common)
- Approach and landing capability
- AP, FD, and A/THR engagement status
- Special Messages
- Autobrake modes.


A/THR Modes and Messages
AP/FD Vertical Modes
AP/FD Lateral Modes
AP/FD Common Mode
Approach and Landing Capability
Line 1
Line 2
Line 3
SPEED
ALT
G/S
LOC
CAT3
DUAL
RADIO 20
AP1+2
1FD2
A/THR
Autobrake Modes
Special Messages
Minimums
AP, FD, A/THR Engagement Status

A white box appears for 10 s around the annunciation of:
- An A/THR mode engagement
- An AP/FD mode engagement
- The approach and landing capability (or the change of the approach and landing capability)
- An AP, FD, or A/THR engagement status change.

Special Messages displays three types of messages by the following priority:
- First priority is given to F/CTL messages
- Then vertical FMS messages
- Then EFIS reconfiguration messages.

- FD 2

Ident.: DSC-22_30-80-20-00025767.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	- FD 2
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	FD2 is engaged.

1 FD -

Ident.: DSC-22_30-80-20-00025681.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	1 FD -
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	FD1 is engaged.

1 FD 2

Ident.: DSC-22_30-80-20-00025685.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	1 FD 2
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	FD1 and FD2 are engaged.

A.FLOOR

Ident.: DSC-22_30-80-20-00025547.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	A.FLOOR with a flashing amber box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active and the engines apply maximum thrust, while A.FLOOR conditions are applicable.

ALT (ARMED)

Ident.: DSC-22_30-80-20-00025612.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Altitude mode is armed. The target altitude is the FCU selected altitude. *Note: G/S, F-G/S* ◁* *or FINAL can be simultaneously displayed with ALT, ALT CST or DES.*

ALT (ENGAGED)

Ident.: DSC-22_30-80-20-00025587.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The aircraft maintains the FCU selected altitude.

ALT*

Ident.: DSC-22_30-80-20-00025582.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT *
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The altitude capture mode is engaged, and acquires the FCU selected altitude.

ALT CRZ (ARMED)

Ident.: DSC-22_30-80-20-00025614.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT CRZ
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The altitude mode is armed. The target altitude is the CRZ FL.

ALT CRZ (ENGAGED)

Ident.: DSC-22_30-80-20-00025591.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT CRZ
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The aircraft maintains the cruise altitude. The A/THR SOFT mode is engaged.

ALT CRZ*

Ident.: DSC-22_30-80-20-00025585.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT CRZ *
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The altitude capture mode is engaged, and acquires the cruise altitude.

ALT CST (ARMED)

Ident.: DSC-22_30-80-20-00025613.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT CST
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Altitude mode is armed. The target altitude is an altitude constraint. Note: *G/S, F-G/S ◁ or FINAL can be simultaneously displayed with ALT, ALT CST or DES.*

ALT CST (ENGAGED)

Ident.: DSC-22_30-80-20-00025588.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT CST
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The aircraft maintains the altitude constraint.

ALT CST*

Ident.: DSC-22_30-80-20-00025584.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ALT CST *
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The altitude capture mode is engaged, and acquires an altitude constraint.

AP1

Ident.: DSC-22_30-80-20-00025683.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	AP 1
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	AP1 is engaged.

AP1+2

Ident.: DSC-22_30-80-20-00025682.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	AP 1+2
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	AP1 and AP2 are engaged.

AP2

Ident.: DSC-22_30-80-20-00025684.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	AP 2
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	AP2 is engaged.

APP NAV (ARMED)

Ident.: DSC-22_30-80-20-00025638.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	APP NAV
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Navigation mode is armed for a non precision approach.

APP NAV (ENGAGED)

Ident.: DSC-22_30-80-20-00025634.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	APP NAV
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Navigation mode is engaged during a non precision approach.

A/THR (ACTIVATED)

Ident.: DSC-22_30-80-20-00025686.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	A/THR
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The A/THR is active.

A/THR (ARMED)

Ident.: DSC-22_30-80-20-00025687.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	A/THR
Column	AP, FD, and A/THR Engagement Status - Column 5 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The A/THR is armed and not active.

AUTO LAND (GLS ◁✳)

Ident.: DSC-22_30-80-20-00025676.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	AUTO LAND (GLS ◁✳)
Column	Approach and Landing Capability - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A GLS ◁✳ approach is selected and the GLS ◁✳ automatic landing capability is available.

BARO XXXXX

Ident.: DSC-22_30-80-20-00025679.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FMA Display	BARO XXXXX
Column	Minimums - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Minimum Descent Altitude or Minimum Descent Height as inserted by the flight crew in the PERF APPR page.

BRK LO (ARMED)

Ident.: DSC-22_30-80-20-00025753.0008001 / 18 MAY 22
Applicable to: LV-GIF

FMA Display	BRK LO
Column	Autobrake Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/BRK is armed in LO mode.

BRK LO (ACTIVATED)

Ident.: DSC-22_30-80-20-00025551.0008001 / 18 MAY 22
Applicable to: LV-GIF

FMA Display	BRK LO with permanent white box
Column	Autobrake Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/BRK is active in LO mode.

BRK MAX (ACTIVATED)

Ident.: DSC-22_30-80-20-00025558.0008001 / 18 MAY 22
Applicable to: LV-GIF

FMA Display	BRK MAX whit permanent white box
Column	Autobrake Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/BRK is active in MAX mode.

BRK MAX (ARMED) ON LINE 2

Ident.: DSC-22_30-80-20-00025756.0005001 / 18 MAY 22
Applicable to: LV-GIF

FMA Display	BRK MAX
Column	Autobrake Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/BRK is armed in MAX mode.

BRK MED (ARMED)

Ident.: DSC-22_30-80-20-00025754.0008001 / 18 MAY 22
Applicable to: LV-GIF

FMA Display	BRK MED
Column	Autobrake Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/BRK is armed in MED mode.

BRK MED (ACTIVATED)

Ident.: DSC-22_30-80-20-00025557.0008001 / 18 MAY 22
Applicable to: LV-GIF

FMA Display	BRK MED with permanent white box
Column	Autobrake Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/BRK is active in MED mode.

CAT1

Ident.: DSC-22_30-80-20-00025648.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	CAT 1
Column	Approach and Landing Capability - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	CAT1 approach capability is available. The type of guidance for the selected approach is LOC and G/S.

CAT2

Ident.: DSC-22_30-80-20-00025649.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	CAT 2
Column	Approach and Landing Capability - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	CAT2 approach capability is available. The type of guidance for the selected approach is LOC and G/S.

CAT3 DUAL

Ident.: DSC-22_30-80-20-00025674.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	CAT3 DUAL
Column	Approach and Landing Capability - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	CAT3 approach capability is available, with FAIL OPERATIONAL condition. The type of guidance for the selected approach is LOC and G/S.

CAT3 SINGLE

Ident.: DSC-22_30-80-20-00025650.0001001 / 04 MAY 23
Applicable to: ALL

FMA Display	CAT 3 SINGLE
Column	Approach and Landing Capability - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	CAT3 approach capability is available, with FAIL PASSIVE condition. The type of the guidance for the selected approach is LOC and G/S.

CHECK APPR SELECTION

Ident.: DSC-22_30-80-20-00025692.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

FMA Display	CHECK APPR SELECTION
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The flight crew manually tuned an ILS / GLS ◁* on the FMS RADIO NAV page. This manually-tuned landing system does not correspond to the approach that is selected in the flight plan. The message is displayed when the aircraft is in cruise at less than 100 NM from the Top of Descent or in descent or in approach.

CHECK APPR SELECTION

Ident.: DSC-22_30-80-20-00025692.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

FMA Display	CHECK APPR SELECTION
Column	Special Messages- Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The flight crew manually tuned an ILS / GLS ◁* on the FMS RADIO NAV page. This manually-tuned landing system does not correspond to the approach that is selected in the flight plan. The message is displayed when the aircraft is in cruise at less than 100 NM from the Top of Descent or in descent or in approach. In approach, pressing the APPR pb arms LOC and G/S modes on the manually-tuned landing system.

CHECK SPEED MODE

Ident.: DSC-22_30-80-20-00025708.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

FMA Display	CHECK SPEED MODE
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The SPEED target is selected and the flight crew didn't enter a speed target in the PERF CLB page, or a speed/Mach target in the PERF DES page.

CLB (ARMED)

Ident.: DSC-22_30-80-20-00025610.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	CLB
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Climb mode is armed.

CLB (ENGAGED)

Ident.: DSC-22_30-80-20-00025578.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	CLB
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Climb mode is engaged. The selected target altitude is higher than the actual altitude. Altitude constraints are taken into account.

DECELERATE

Ident.: DSC-22_30-80-20-00025694.0001001 / 18 MAY 22
Applicable to: LV-KHT, LV-KHU

FMA Display	DECELERATE
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The thrust is not reduced when passing the Top of Descent, and the aircraft is above the flight profile.

DES (ARMED)

Ident.: DSC-22_30-80-20-00025615.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	DES
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The descent mode is armed. *Note:* *G/S, F-G/S ◁ or FINAL can be simultaneously displayed with ALT, ALT CST or DES.*

DES (ENGAGED)

Ident.: DSC-22_30-80-20-00025592.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	DES
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Descent mode is engaged. The selected target altitude is lower than the actual altitude. Altitude constraints are taken into account.

DH XXX

Ident.: DSC-22_30-80-20-00025678.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

FMA Display	DH XXX
Column	Minimums - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Decision Height as inserted by the flight crew in the PERF APPR page.

DISCONNECT AP FOR LDG

Ident.: DSC-22_30-80-20-00025696.0007001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FMA Display	DISCONNECT AP FOR LDG
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)

Continued on the following page

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Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The flight crew must disconnect the AP for landing. This message is displayed when, during a Non-Precision Approach, the AP/FD remains engaged at: - Minimum -50 ft, or - 400 ft AGL (if no minimum entered).

EFIS SINGLE SOURCE 1(2)

Ident.: DSC-22_30-80-20-00025697.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	EFIS SINGLE SOURCE 1(2)
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	CM1 and CM2 Display Units are fed by the same source: either CM1 side source (1) or CM2 side source (2). Range and mode selections can be done only by the appropriate side.

EFIS SWTG NOT ALLOWED

Ident.: DSC-22_30-80-20-00025698.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	EFIS SWTG NOT ALLOWED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The EFIS configuration selected by the flight crew is not allowed: DMC1 for CM2 Display Units, or DMC2 for CM1 Display Units, and the conditions for EFIS SINGLE SOURCE not fulfilled.

EXTEND SPD BRK

Ident.: DSC-22_30-80-20-00025699.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	EXTEND SPD BRK
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)

Continued on the following page

Continued from the previous page

Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	DES mode is engaged, idle is selected, and either: - The aircraft is above the vertical profile, and the predicted intercept point of the theoretical profile is at less than 2 NM from the next ALT CST, and the predicted aircraft altitude at next altitude constraint is greater than ALT CST-500 ft, or - The aircraft is in auto speed control, if the aircraft enters a speedbrake decelerating segment (next speed limit or speed constraint).

FINAL (ARMED)

Ident.: DSC-22_30-80-20-00025618.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	FINAL
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The FINAL descent mode is armed. *Note:* *G/S, F-G/S ◁ or FINAL can be simultaneously displayed with ALT, ALT CST or DES.*

FLARE

Ident.: DSC-22_30-80-20-00025645.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	FLARE
Column	AP/FD Common Modes - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Flare mode is engaged.

FOR GA: SET TOGA

Ident.: DSC-22_30-80-20-00025702.0001001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

FMA Display	FOR GA : SET TOGA
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)

Continued on the following page

Continued from the previous page

Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The flight crew must set the thrust levers to the TOGA detent to perform a go-around. During approach, the flight crew sets the thrust levers to or above the FLX/ MCT detent (but below TOGA), and: - The aircraft is below 1 000 ft RA - The AP and/or the FD are engaged.

FPA

Ident.: DSC-22_30-80-20-00025603.0002001 / 18 MAY 22
Applicable to: ALL

FMA Display	FPA +/-X.X°
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Flight Path Angle mode is engaged to acquire and maintain the FPA selected on the FCU. The target is displayed in blue. If the aircraft reaches VLS or VMAX and cannot maintain the target, the indication is boxed amber and flashes, and the target pulses.

GA TRK

Ident.: DSC-22_30-80-20-00025633.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	GA TRK
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Go-Around Track mode is engaged.

G/S (ARMED)

Ident.: DSC-22_30-80-20-00025616.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	G/S
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)

Continued on the following page

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Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Glide Slope mode is armed. *Note:* *G/S, F-G/S* ◁ *or FINAL can be simultaneously displayed with ALT, ALT CST or DES.*

G/S (ENGAGED)

Ident.: DSC-22_30-80-20-00025595.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	G/S
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Glide Slope track mode is engaged.

G/S*

Ident.: DSC-22_30-80-20-00025594.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	G/S *
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Glide Slope capture mode is engaged.

HDG

Ident.: DSC-22_30-80-20-00025625.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	HDG
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Heading mode is engaged.

LAND

Ident.: DSC-22_30-80-20-00025646.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LAND
Column	AP/FD Common Modes - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Land mode is engaged below 400 ft RA.

LOC (ARMED)

Ident.: DSC-22_30-80-20-00025637.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LOC
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Localizer mode is armed.

LOC (ENGAGED)

Ident.: DSC-22_30-80-20-00025628.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LOC
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Localizer track mode is engaged.

LOC*

Ident.: DSC-22_30-80-20-00025627.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LOC *
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Localizer capture mode is engaged.

LOC B/C (ARMED)

Ident.: DSC-22_30-80-20-00025636.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LOC B/C
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Localizer Back Course mode is armed.

LOC B/C (ENGAGED)

Ident.: DSC-22_30-80-20-00025630.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LOC B/C
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Localizer Back Course track mode is engaged.

LOC B/C*

Ident.: DSC-22_30-80-20-00025629.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LOC B/C *
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Localizer Back Course capture mode is engaged.

LVR ASYM

Ident.: DSC-22_30-80-20-00025552.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LVR ASYM
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	One thrust lever is in a detent (CLB or MCT) while all others are not in this detent.

LVR CLB

Ident.: DSC-22_30-80-20-00025554.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LVR CLB (flashing)
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Request to set the thrust levers in CL detent. LVR CLB flashes and a single chime sounds every 5 s, as long as the flight crew does not take action.

LVR MCT

Ident.: DSC-22_30-80-20-00025555.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	LVR MCT (flashing)
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Request to set the thrust levers in MCT detent. LVR MCT flashes and a single chime sounds every 5 s, as long as the flight crew does not take action.

LVR TOGA

Ident.: DSC-22_30-80-20-00025556.0001001 / 15 NOV 22
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

FMA Display	LVR TOGA (flashing) (Soft Go-Around ◁)
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Request to set the thrust levers to the TOGA detent, if during a Soft Go-Around ◁ , one of the following occur: - One engine fails, or - One thrust lever is set to idle position, or - One engine is not in soft go-around thrust mode, or - The soft go-around function is lost. *Note:* *If the thrust levers are below the TOGA detent, the MASTER CAUT light comes on and a single chime sounds.*

LVR TOGA

Ident.: DSC-22_30-80-20-00025556.0009001 / 15 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

FMA Display	LVR TOGA (flashing)
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)

Display Conditions	Request to set the thrust levers to the TOGA detent, if one the following conditions is applicable:
	During takeoff:
	- Upon selection of thrust levers to FLX/MCT detent without selecting FLEX or (Derated Takeoff ◁✳) mode on the PERF TAKEOFF page.
	During a go-around:
	- Upon a go-around performed with one engine inoperative (engine failed or corresponding thrust levers is set to idle), and the flight crew reduces the thrust lever of operative engine to FLX/MCT detent before reaching the thrust reduction altitude.
	- Upon a Soft Go-Around ◁✳
	  - One engine fails, or
	  - One thrust lever is set to idle position, or
	  - One engine is not in soft go-around thrust mode, or
	  - The soft go-around function is lost.
	Note: *If the thrust levers are below the TOGA detent, the MASTER CAUT light comes on and a single chime sounds.*

MACH

Ident.: DSC-22_30-80-20-00025775.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MACH
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active and controls a MACH target.

MACH SEL:.XX

Ident.: DSC-22_30-80-20-00025620.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MACH SEL:.XX
Column	Special Messages - Column 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Indicates a preset Mach associated with the cruise, climb or descent phase.

MAN DTO

Ident.: DSC-22_30-80-20-00025519.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MAN DTO with a permanent white box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is armed, at least one thrust lever is in FLX/MCT detent, with an entered derated level. The other thrust lever is at, or below the FLX/MCT detent.

MAN FLX XX

Ident.: DSC-22_30-80-20-00025516.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MAN FLX XX with a permanent white box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is armed, at least one thrust lever is in FLX/MCT detent, with FLX TO temperature (displayed in blue), set by the flight crew in the PERF TAKEOFF page. The related engine apply flexible thrust, with FLX TO temperature set by the flight crew. The other thrust lever is at, or below the FLX/MCT detent.

MAN MCT

Ident.: DSC-22_30-80-20-00025518.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MAN MCT with a permanent white box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)

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Line	Line 1 and 2 - (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is armed, at least one thrust lever is in FLX/MCT detent. The other thrust levers are at, or below this detent and no FLX TO temperature, nor a Derated Takeoff ◁ level is entered.

MAN PITCH TRIM ONLY

Ident.: DSC-22_30-80-20-00025703.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MAN PITCH TRIM ONLY
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Displayed in case of loss of L + R elevators.

MAN THR

Ident.: DSC-22_30-80-20-00025521.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MAN THR with a permanent amber box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is armed, and: - The most advanced thrust lever is between FLX/MCT and TOGA detent, or - All thrust levers are above CL detent (AEO) but not in FLX/MCT or TOGA detent, or - The most advanced thrust lever is between CL and FLX/MCT detent, or - All thrust levers are below CL detent. *Note:* *In the case of OEI, corresponding thrust lever is not taken into account. The operative engines apply a thrust defined by the thrust lever position.* *Note:* *In the case of a Soft Go-Around ◁ , if the flight crew sets the thrust levers directly to FLX/MCT and not to TOGA then FLX/MCT, MAN THR will appear.*

MAN TOGA

Ident.: DSC-22_30-80-20-00025515.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	MAN TOGA with a permanent white box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)

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Line	Line 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is armed, at least one thrust lever is in TOGA detent. The related engine applies maximum thrust.

MDA XXXXX

Ident.: DSC-22_30-80-20-00025675.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

FMA Display	MDA XXXXX
Column	Minimums - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Minimum Descent Altitude or Minimum Descent Height as inserted by the flight crew in the PERF APPR page.

MDH XXXXX

Ident.: DSC-22_30-80-20-00025677.0001001 / 18 MAY 22
Applicable to: LV-GKO, LV-GKP

FMA Display	MDH XXXXX
Column	Minimums - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Minimum Descent Altitude or Minimum Descent Height as inserted by the flight crew in the PERF APPR page.

NAV (ARMED)

Ident.: DSC-22_30-80-20-00025639.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	NAV
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Navigation mode is armed.

NAV (ENGAGED)

Ident.: DSC-22_30-80-20-00025626.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	NAV
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Navigation mode is engaged to guide the aircraft along the lateral flight plan.

NO DH

Ident.: DSC-22_30-80-20-00025673.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	NO DH
Column	Minimums - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	When NO is inserted in the PERF APPR page.

OP CLB (ARMED)

Ident.: DSC-22_30-80-20-00025611.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	OP CLB
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Open Climb mode is armed.

OP CLB (ENGAGED)

Ident.: DSC-22_30-80-20-00025580.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	OP CLB
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Open Climb mode is engaged. The selected target altitude is higher than the actual altitude.

OP DES

Ident.: DSC-22_30-80-20-00025593.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	OP DES
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Open Descent mode is engaged. The selected target altitude is lower than the actual altitude.

RADIO XXX

Ident.: DSC-22_30-80-20-00025680.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FMA Display	RADIO XXX
Column	Minimums - Column 4 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Decision Height as inserted by the flight crew in the PERF APPR page.

RETRACT SPD BRK

Ident.: DSC-22_30-80-20-00025704.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	RETRACT SPD BRK
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Speedbrakes are extended, DES mode or FINAL APP mode is engaged, and either: - ALT* or ALT CST* or ALT CRZ* or ALT or ALT CST or ALT CRZ mode engages, or - The aircraft is below the path, or - CONF 3 or FULL is reached.

ROLL OUT

Ident.: DSC-22_30-80-20-00025644.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	ROLL OUT
Column	AP/FD Common Modes - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)

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Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Roll Out mode is engaged.

RWY

Ident.: DSC-22_30-80-20-00025622.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	RWY
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Runway mode is engaged.

RWY TRK

Ident.: DSC-22_30-80-20-00025623.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	RWY TRK
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Runway Track mode is engaged once airborne at, or above 30 ft.

SET GREEN DOT SPEED

Ident.: DSC-22_30-80-20-00025705.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	SET GREEN DOT SPEED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The aircraft is in Engine-Out mode and the SPEED target is selected. This message is displayed if the FCU selected speed is: - Equal to or less than Green Dot -10 kt, or - Equal to or greater than Green Dot +10 kt except in ALT* and ALT mode.

SET HOLD SPEED

Ident.: DSC-22_30-80-20-00025706.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	SET HOLD SPEED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The aircraft is in selected SPEED control, an HM leg is inserted in the F-PLN and the aircraft is 30 s before the deceleration point to the precomputed HOLD SPEED.

SET MANAGED SPEED

Ident.: DSC-22_30-80-20-00025707.0001001 / 18 MAY 22
Applicable to: LV-KHT, LV-KHU

FMA Display	SET MANAGED SPEED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The SPEED target is selected and a preselected SPEED does not exist for the next flight phase.

SPEED

Ident.: DSC-22_30-80-20-00025546.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	SPEED
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active and controls a speed target target.

SPEED SEL:XXX

Ident.: DSC-22_30-80-20-00025619.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	SPEED SEL:XXX
Column	Special Messages - Column 1 and 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	Indicates a preset speed associated with the cruise, climb or descent phase.

SRS

Ident.: DSC-22_30-80-20-00025575.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	SRS
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The speed reference system mode is engaged during takeoff or go-around.

TCAS (ARMED)

Ident.: DSC-22_30-80-20-00025621.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

FMA Display	TCAS
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The AP/FD TCAS mode is armed.

TCAS (ENGAGED)

Ident.: DSC-22_30-80-20-00025604.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

FMA Display	TCAS
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The AP/FD TCAS mode is engaged. The FG provides a vertical guidance in the case of a RA alert, generated by the TCAS.

TCAS RA INHIBITED

Ident.: DSC-22_30-80-20-00025709.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

FMA Display	TCAS RA INHIBITED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The AP/FD TCAS mode disengages because the TA only or the STBY mode of the TCAS is selected (*Refer to DSC-22_30-40-100 AP/FD TCAS Mode Availability*).

T/D REACHED

Ident.: DSC-22_30-80-20-00025695.0001001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

FMA Display	T/D REACHED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The thrust is not reduced when passing the Top of Descent, and the aircraft is above the flight profile.

THR CLB

Ident.: DSC-22_30-80-20-00025540.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR CLB
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active in thrust mode and the most advanced thrust lever is in the CL detent.

THR DCLB 1(2)

Ident.: DSC-22_30-80-20-00025541.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR DCLB 1(2)
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active in thrust mode. The most advanced thrust lever is in the CL detent, and the flight crew has selected a derated climb.

THR DES

Ident.: DSC-22_30-80-20-00025545.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR DES
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active in thrust mode and commands a reduced thrust, while DES mode is engaged. The engines apply a thrust slightly highest than idle thrust.

THR IDLE

Ident.: DSC-22_30-80-20-00025542.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR IDLE
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active in thrust mode and the engines apply idle thrust.

THR LK

Ident.: DSC-22_30-80-20-00025553.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR LK (flashing)
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The thrust is frozen due to a non-standard A/THR disconnection (FCU disconnection or failure). MASTER CAUT light flashes and a single chime sounds every 5 s, as long as the flight crew does not take action.

THR LVR

Ident.: DSC-22_30-80-20-00025544.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR LVR
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active in thrust mode, all thrust levers are below CL detent, or the most advanced thrust lever(s) is between CL and MCT detent with at least one thrust lever in CL detent.

THR MCT

Ident.: DSC-22_30-80-20-00025522.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	THR MCT
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)

Continued on the following page

Continued from the previous page

Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active in thrust mode and the most advanced thrust lever is in the MCT detent (OEI). The operative engines apply maximum continuous thrust.

TOGA LK

Ident.: DSC-22_30-80-20-00025549.0001001 / 18 MAY 22
Applicable to: ALL

FMA Display	TOGA LK with a flashing amber box
Column	A/THR Messages and Modes - Column 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	A/THR is active and TOGA thrust is frozen (A.FLOOR conditions are no longer applicable).

TRACK

Ident.: DSC-22_30-80-20-00025624.0001001 / 04 MAY 23
Applicable to: ALL

FMA Display	TRACK
Column	AP/FD Lateral Modes - Column 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Track mode is engaged.

TRK FPA DESELECTED

Ident.: DSC-22_30-80-20-00025710.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

FMA Display	TRK FPA DESELECTED
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	At clear of conflict, informs that the flight reference TRK/FPA changed to HDG / V/S following AP/FD engagement.

USE MAN PITCH TRIM

Ident.: DSC-22_30-80-20-00025711.0002001 / 18 MAY 22
Applicable to: ALL

FMA Display	USE MAN PITCH TRIM
Column	Special Messages - Column 2 and 3 (*Refer to DSC-22_30-80-20 FMA Display*)

Continued on the following page

Continued from the previous page

Line	Line 3 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	F/CTL are in direct law or in flare law with dual RA failure, or the F/CTL STAB CTL FAULT alert is triggered.

V/S

Ident.: DSC-22_30-80-20-00025600.0002001 / 18 MAY 22
Applicable to: ALL

FMA Display	V/S ±XXXX
Column	AP/FD Vertical Modes - Column 2 (*Refer to DSC-22_30-80-20 FMA Display*)
Line	Line 1 (*Refer to DSC-22_30-80-20 FMA Display*)
Display Conditions	The Vertical Speed mode is engaged to acquire and maintain the V/S selected on the FCU. The target is displayed in blue. If the aircraft reaches VLS or VMAX and cannot maintain the target, the indication is boxed amber and flashes, and the target pulses.

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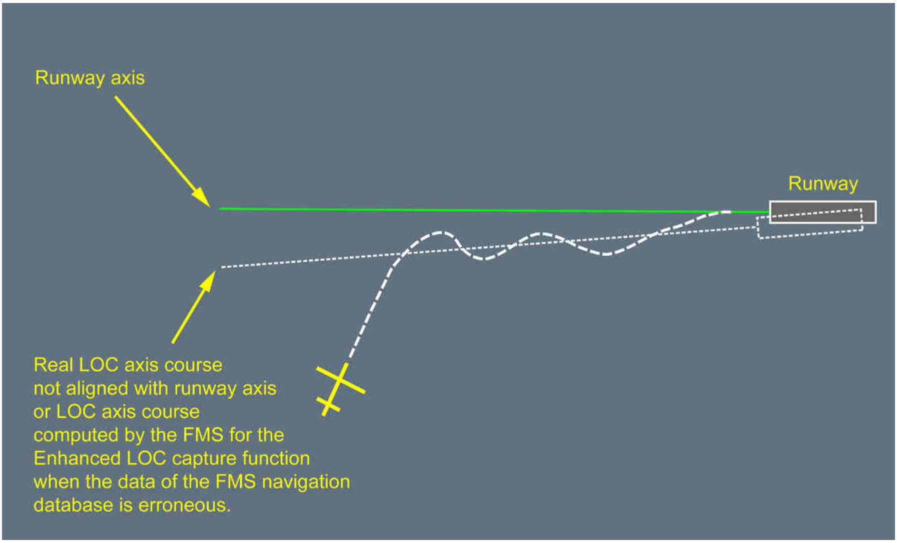
MISBEHAVIOUR OF THE ENHANCED LOC CAPTURE

Ident.: DSC-22_30-110-00023522.0001001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DESCRIPTION

With the Enhanced LOC capture function, the aircraft may oscillate on one side of the LOC axis when one of the following occurs:

- The LOC ground antenna position is unusual (ahead of the runway threshold or not aligned with the runway axis), or
- The LOC course is not aligned with the runway axis, or
- The FMS navigation database is erroneous regarding:
  - The coordinates of the runway threshold, or
  - The coordinates of the LOC ground antenna, or
  - The course of the LOC.


Runway axis
Runway
Real LOC axis course not aligned with runway axis or LOC axis course computed by the FMS for the Enhanced LOC capture function when the data of the FMS navigation database is erroneous.

OPERATIONAL RECOMMENDATION

On approaches where errors are identified in the FMS Navigation Database, the flight crew must manually tune the ILS via the RMP before arming the APPR mode (or the LOC mode).

On runway with unusual LOC position or with LOC course not aligned with runway axis, in case of roll oscillations during LOC capture, the flight crew shall consider to discontinue the approach.

On the next approach, the flight crew must manually tune the ILS via the RMP before arming the APPR mode (or the LOC mode).

AIRCRAFT SYSTEMS

AUTO FLIGHT - FLIGHT ENVELOPE

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DSC-22_40-10 General

General....A

DSC-22_40-20 Acquisition/Monitoring

ACQUISITION/MONITORING....A

DSC-22_40-30 Characteristic Speeds Computation

CHARACTERISTIC SPEEDS COMPUTATION....A

DSC-22_40-40 Weight and Center of Gravity Computation

WEIGHT AND CENTER OF GRAVITY COMPUTATION....A

DSC-22_40-50 AFT CG Monitoring

AFT CG MONITORING....A

DSC-22_40-60 Windshear Detection

Windshear Detection....A

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GENERAL

Ident.: DSC-22_40-10-00001395.0001001 / 10 JAN 11
Applicable to: ALL

The Flight Envelope (FE) part of the FMGES performs the following functions :
- Acquisition and monitoring of parameters used by FE and FG parts
- Characteristic speeds computation
- Back-up weight and CG computation
- Aft CG monitoring
- Windshear detection.

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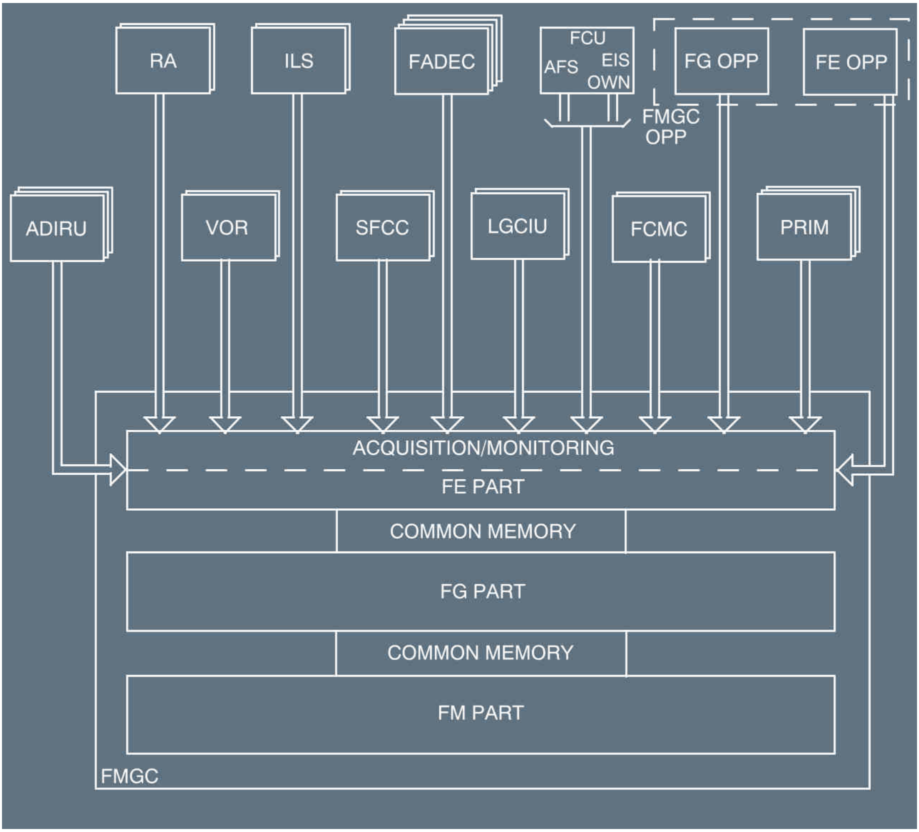
ACQUISITION/MONITORING

Ident.: DSC-22_40-20-00001396.0001001 / 19 DEC 12
Applicable to: ALL

Acquisition and monitoring of buses common to FM, FG or FE are performed by the FE. Only ARINC buses specific to the FM part are acquired by the FM itself.
Dialogue between FM, FG and FE is achieved through common memories.


RA
ILS
FADEC
FCU
AFS
EIS
OWN
FG OPP
FE OPP
FMGC
OPP
ADIRU
VOR
SFCC
LGCIU
FCMC
PRIM
ACQUISITION/MONITORING
FE PART
COMMON MEMORY
FG PART
COMMON MEMORY
FM PART
FMGC

The FE function generates the following information :
- Flight/ground conditions (LGCIU/SFCC).
- Flap/slat configuration (SFCC).

- Engine configuration (FADEC).
- ADR/IR parameters after filtering and consolidation (used by the control laws).

CHARACTERISTIC SPEEDS COMPUTATION

Ident.: DSC-22_40-30-00001397.0001001 / 21 MAR 17
Applicable to: ALL

FE part computes the characteristic speeds and sends them to :

- The FG which uses them as limits for guidance modes.
- The EFIS for display on the PFD speed scale.

The following speeds are computed :

Minimum speeds

- **VLS**
  (*Refer to DSC-22_10-50-20 Characteristic Speeds*)
- **Manoeuvring speeds F, S, O (Green Dot)**
  (*Refer to DSC-22_10-50-20 Characteristic Speeds*)

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WEIGHT AND CENTER OF GRAVITY COMPUTATION

Ident.: DSC-22_40-40-00001399.0001001 / 10 DEC 09
Applicable to: ALL

The FMGC uses the weight and center of gravity from the FCMC (Fuel Computer) when available.

The GW and CG, computed by the FE part, are used :
- As backup, in case of a dual FCMC failure.
- To trigger the aft CG caution and warning signals (independently of the FCMC).

FE WEIGHT COMPUTATION (BACKUP)

- When the aircraft is below 14 625 ft, and 255 kt :
  GW = f(α, CAS, N1/EPR actual, CG from FE part, altitude)
- When the aircraft is above 14 625 ft, or 255 kt :
  GW = TOGW – WFU
  TOGW : Takeoff Gross Weight
  WFU : Weight Fuel Used, acquired from the FADECs.

FE CENTER OF GRAVITY COMPUTATION (BACKUP/AFT CG WARNING)

The CG is computed from the position of the horizontal stabilizer, and is function of the N1/EPR, Vc, ALT, MACH and GW from FE part.

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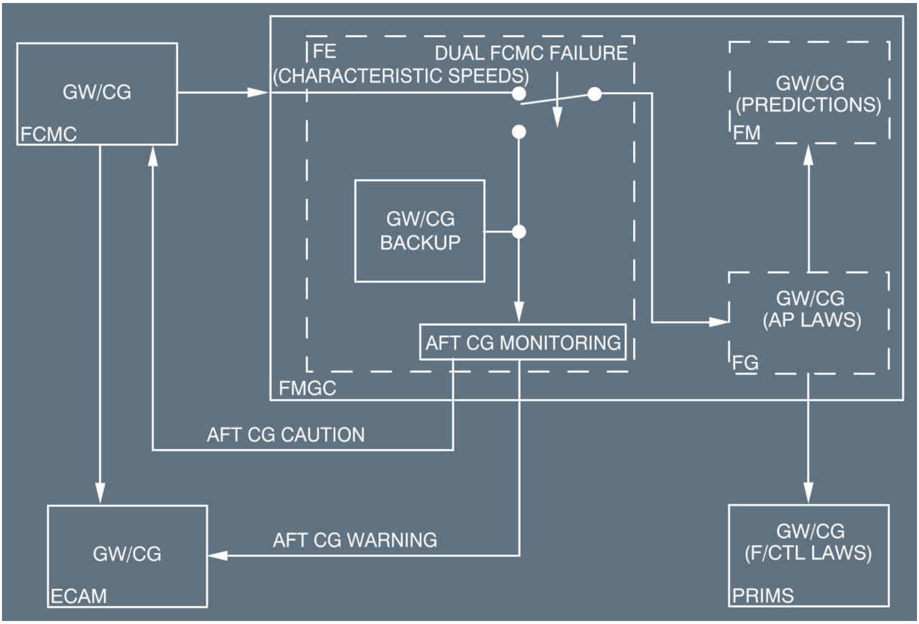
AFT CG MONITORING

Ident.: DSC-22_40-50-00001400.0001001 / 19 DEC 12
Applicable to: ALL

The flight envelope only uses its own computed Gross Weight (GW) and Center of Gravity (CG) to trigger the aft CG signals.
The current CG is compared to the aft CG limit, computed from the GW.
If the CG > CG limit -1 %, an aft CG caution signal is sent to the FCMCs. The target CG is then shifted forward by 1.5 % (only one time). If the CG becomes higher than the CG limit, the aft CG warning signal is sent to the FWCs, which trigger a red warning.


GW/CG
FCMC
FE
(CHARACTERISTIC SPEEDS)
DUAL FCMC FAILURE
GW/CG
(PREDICTIONS)
FM
GW/CG
BACKUP
AFT CG MONITORING
GW/CG
(AP LAWS)
FG
FMGC
AFT CG CAUTION
GW/CG
ECAM
AFT CG WARNING
GW/CG
(F/CTL LAWS)
PRIMS

Note: *AFT CG monitoring is available above 20 000 ft, if the aircraft is in clean configuration with the speedbrakes retracted.*

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WINDSHEAR DETECTION

Ident.: DSC-22_40-60-00001401.0001001 / 19 DEC 12
Applicable to: ALL

A windshear detection signal is generated whenever the aircraft encounters a windshear and the predicted energy level falls below a predetermined safe minimum energy threshold (reactive windshear detection).

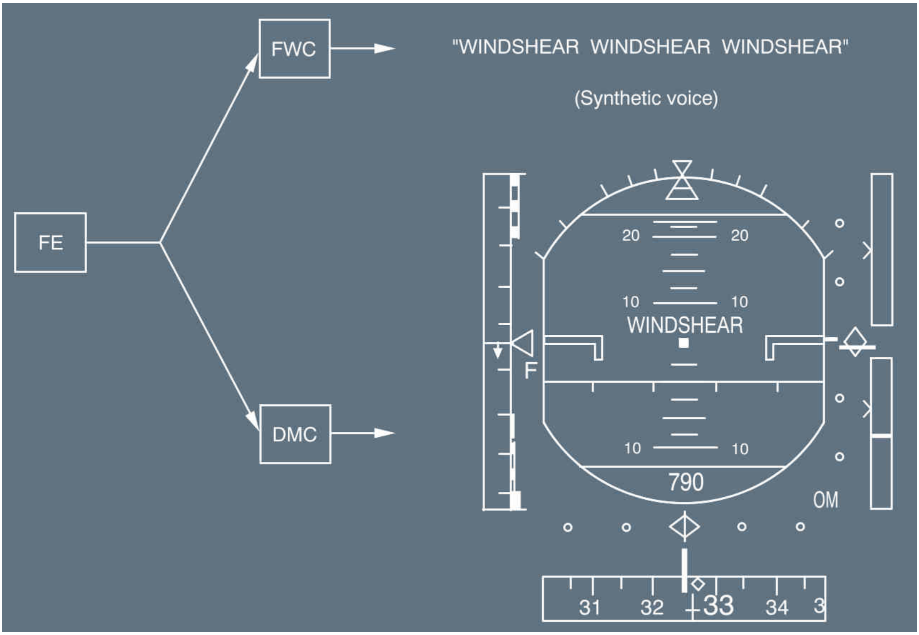
Note: *The energy threshold is expressed as an angle of attack threshold αo.*

The aircraft predicted energy level is $\alpha + \Delta\alpha$ where:
- *α is the current angle of attack*
- *$\Delta\alpha$ is the equivalent AOA computed from measured vertical drafts and longitudinal shears.*

If $\alpha + \Delta\alpha > \alpha o$ the windshear conditions are detected.

The windshear detection function is provided in takeoff and approach phase under the following conditions:
- At takeoff, 3 s after liftoff, up to 1 300 ft RA
- At landing from 1 300 ft RA to 50 ft RA
- With at least CONF 1 selected.

The warning consists of:
- A visual “WINDSHEAR” red message displayed on both PFDs for a minimum of 15 s.
- An aural synthetic voice announcing ”WINDSHEAR” three times.


FWC
"WINDSHEAR WINDSHEAR WINDSHEAR"
(Synthetic voice)
FE
DMC
WINDSHEAR
F
OM

AIRCRAFT SYSTEMS

AUTO FLIGHT - AOC FUNCTIONS

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General....A
Flight Plan Initialization Function....B
Takeoff Data Function....C
Wind Data Function....D
Flight Reports....E

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GENERAL

Ident.: DSC-22_45-00001402.0001001 / 17 FEB 11
Applicable to: ALL

The FMS AOC function gives an interface between a ground station and one onboard FMGEC, allowing data transmission between these two computers via the ACARS Management Unit or the ATSU.

Two different sets of message can be exchanged:
- UPLINK messages from the ground station. They consist in reception of data requested or directly sent to the crew
- DOWNLINK messages from the FMGEC (master). They consist in reports or requests sent to the ground station.

The FMGES/ACARS or FMGES/ATSU interface enables the following AOC capabilities.
- F-PLN initialization (flight plan and performance data)
- Takeoff data
- Wind data
- Flight reports
- Broadcast data.

Crews can send message using ACARS FUNCTION pages or relevant MCDU pages.
Only one FMGEC talks to the ground station. This FMGEC is called FMGEC “master”.

GENERAL SCRATCHPAD MESSAGES

NOT XMITTED TO ACARS	:	A crew request or report was sent to the ground but the communication was not established or not acknowledged.
NO ANSWER TO REQUEST	:	A crew request was previously sent to the ground and no answer (uplink message) was received within 4 min.

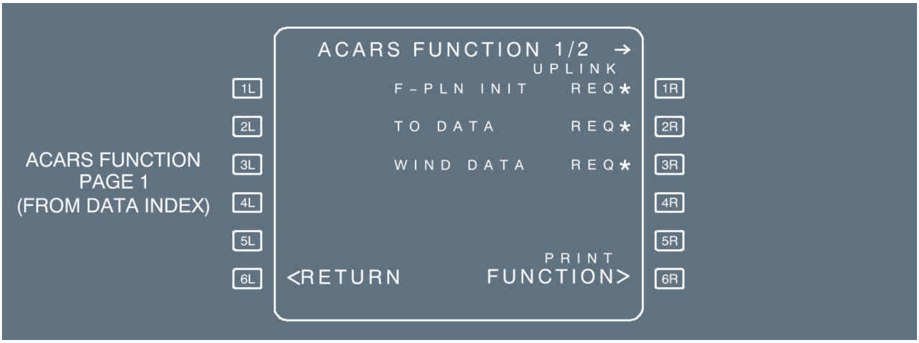
FLIGHT PLAN INITIALIZATION FUNCTION

Ident.: DSC-22_45-00001403.0001001 / 01 OCT 12
Applicable to: ALL

This function enables lateral and vertical flight plan data as well as performance data to be exchanged between the aircraft and a ground station. The aircraft may send flight plan requests for active and secondary flight plan. (downlink messages). The ground station may send flight plan and performance data (uplink messages) either under aircraft request or automatically without any request.
Each uplink message concerns either the active or secondary flight plan but never both flight plans at the same time. The data sent to the aircraft are checked for flight plan consistency.
A MCDU message comes up when an uplink message is received. “ACT (or SEC) RTE UPLINK”.

If an error prevents the decoding process of the message, “INVALID RTE UPLINK” is displayed on MCDUs.
An uplink message can be routed to the active flight plan if no engine is started and no active flight plan exists. Otherwise, it is routed to the secondary. The crew will insert it into the secondary flight plan or will reject it using the CLR key.

Note: *The flight plan may also be initialized using the ACARS FUNCTION page selected from DATA INDEX page.*



PERFORMANCE DATA

On ground and before engine start, the ground station may also send performance data to the aircraft.
Performance data are always associated with the uplink flight plan. It is either automatically inserted with the active flight plan data, or stored in the secondary with the corresponding flight plan.
This message contains part or all of the following data:
ZFW, ZFWCG, taxi fuel, block fuel, cruise flight level, tropopause altitude, cruise temperature, transition altitude, cost index, performance factor.

Note: *After engine start an uplink performance data message is rejected automatically without any scratchpad message.*

SCRATCHPAD MESSAGES RELATED TO FLIGHT PLAN AND PERFORMANCE

INVALID RTE UPLINK	An error is detected, the uplink message is rejected.
ACT or SEC RTE UPLINK	A F-PLN is stored in the active or secondary flight plan.
FLT NUMBER UPLINK	FLT NBR has been initialized within a F-PLN message without previous request.
CHECK FLT NUMBER	The uplinked FLT NBR differs from the one specified in the request.

CHECK CO RTE	The uplinked CO RTE ident differs from the one specified in the request.
INVALID FLT NBR UPLINK	The uplink contains a valid F-PLN but the FLT NBR is invalid.
PERF DATA UPLINK	Performance data is received
INVALID PERF UPLINK	Performance uplink message has been rejected
RTE DATALINK IN PROG	A flight plan modification is performed after a F-PLN INIT request has been sent; this message is displayed until the uplink is received.
UPLINK INSERT IN PROG	This message is displayed during insertion of a Flight Plan.

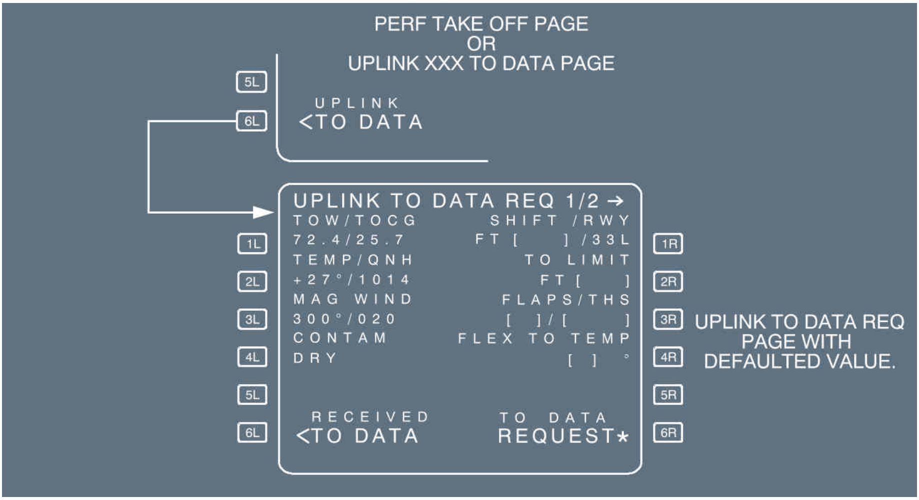
TAKEOFF DATA FUNCTION

Ident.: DSC-22_45-00001404.0001001 / 03 NOV 21
Applicable to: ALL

The takeoff data function is available for the active flight plan only. It is used to request to the ground station, information data for up to 2 runways and to receive this data for up to 4 runways.
The flight crew sends a request indicating the departure airport, runway idents, CG, GW and weather conditions (such as BARO setting wind, temperature...). In response the flight crew receives the takeoff speeds for up to 4 runways but only one set of data may be inserted in the active flight plan for the selected active runway.
Takeoff speeds are computed for MAX and flex takeoff.

The takeoff data function has required the modification of the standard PERF TAKEOFF page and the addition of 2 news pages:
- UPLINK TO DAT REQ page that enables the flight crew to specify a request to the ground.
- UPLINK XXX TO DATA page (XXX for MAX or FLEX)

These 2 pages are accessed from the PERF TAKEOFF page in PREFLIGHT and DONE phase only.



PERF TAKE OFF PAGE
OR
UPLINK XXX TO DATA PAGE

UPLINK
<TO DATA

UPLINK TO DATA REQ 1/2 →
TOW/TOCG SHIFT /RWY
72.4/25.7 FT [ ] /33L
TEMP/QNH TO LIMIT
+27°/1014 FT [ ]
MAG WIND FLAPS/THS
300°/020 [ ]/[ ]
CONTAM FLEX TO TEMP
DRY [ ] °
RECEIVED TO DATA
<TO DATA REQUEST*

UPLINK TO DATA REQ
PAGE WITH
DEFAULTED VALUE.

SCRATCHPAD MESSAGES RELATED TO TAKEOFF DATA

TAKEOFF DATA UPLINK :	Takeoff data uplink message is received
INVALID TAKEOFF UPLINK :	The UPLINK message is rejected

WIND DATA FUNCTION

Ident.: DSC-22_45-00001405.0004001 / 01 MAR 18
Applicable to: ALL

This function enables the crew to request and to receive forecasted winds associated to the active or secondary flight plan.
The uplink message (ground station to aircraft) may be received upon crew request or automatically without crew request.
The request is initiated from WIND pages or from AOC FUNCTION page.
The uplink wind data when received are directly displayed on the wind pages but not inserted in the flight plan, one set for each flight phase: CLIMB, CRUISE, DESCENT. The alternate wind at alternate cruise flight level is displayed on DESCENT page.

- Winds are associated to altitude for climb an descent phases
- Winds are associated to four altitudes for each waypoint for cruise phase and step level
  - On ground and without entered winds (except the trip wind), an uplink message is directly inserted in the flight plan
  - In flight, winds are temporarily stored until the crew inserts them phase per phase
    Phase of flight is indicated in the WIND title page
  - Clearing the INSERT UPLINK* prompt using the CLR key deletes the uplink wind data for the selected phase.

When uplink winds are deleted, the wind page reverts to the previous status.
The flight crew can modify the wind data of the F-PLN B page, only after the uplink wind data has been inserted. AOC uplink winds are then considered as crew manual entries (large font).

SCRATCHPAD MESSAGES RELATED TO WIND DATA

INVALID WIND UPLINK	An error is detected, the uplink is rejected.
WIND DATA UPLINK	Uplinked winds are received.
WIND UPLINK EXISTS	A F-PLN modification (active or secondary) is attempted when uplink winds are not inserted. This message disappears automatically when the wind uplink is inserted or deleted.
CHECK DEST DATA	The aircraft is at 180 NM from destination, and the destination QNH, TEMP or WIND displayed on the PERF APPR page was received by AOC uplink or, if following insertion of a descent wind uplink, a conflict concerning the above parameters exists.
CHECK ALTN WIND	The uplinked alternate cruise flight level differs from the default alternate cruise flight level.

FLIGHT REPORTS

Ident.: DSC-22_45-00001406.0001001 / 17 FEB 11
Applicable to: ALL

Flight reports provide real time information to the ground concerning the aircraft current situation and position.

Several types of flight reports are available:

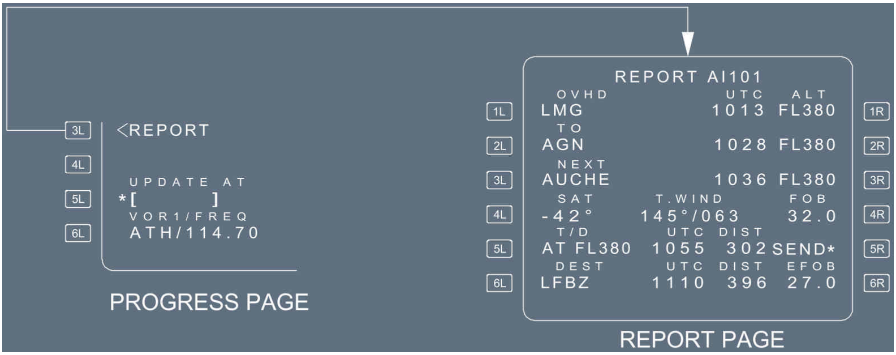
- The Position report	:	Provides current aircraft position
- The Progress report	:	Provides data relative to the destination
- The Flight-Plan report	:	Provides the active route
- The Performance Data report	:	Provides performance data currently used by FMS.

These reports may be manually initiated via a dedicated prompt or automatically sent in response to a ground request or upon specific conditions.

POSITION REPORT

This report is sent:
- Manually via a MCDU prompt, or
- Following a ground request, or
- Automatically upon sequencing a designated reporting fix (designated by the ground in a uplink message).

The manual POSITION REPORT downlink prompt is displayed on the REPORT page POS prompt.



```
<REPORT

 UPDATE AT
*[        ]
 VOR1/FREQ
 ATH/114.70
```

PROGRESS PAGE

```
          REPORT AI101
 OVHD              UTC   ALT
LMG                1013  FL380
 TO
AGN                1028  FL380
 NEXT
AUCHE              1036  FL380
 SAT       T.WIND          FOB
-42°      145°/063        32.0
 T/D         UTC  DIST
AT FL380    1055  302SEND*
 DEST        UTC  DIST    EFOB
LFBZ        1110  396     27.0
```

REPORT PAGE

Note: Position report are initiated from active flight plan only.

POSITION REPORT CONTENT

The downlinked message contains exactly the REPORT page data.

PROGRESS REPORT

A progress report contains data relative to the aircraft arrival time and EFOB at destination for the active F-PLN.

This downlink message is automatically sent following:
- A ground request, or
- A change of destination, or

- A change of runway, or
- A specific event. The possible events that can be selected in the navigation database policy file are:
  - X minutes to Top of Descent
  - Z minutes to Destination
  - ETA changes more than W minutes from the previous report.
    X, Z and W are minutes of time set in the navigation database policy file.

The progress report cannot be manually sent by the crew via a dedicated MCDU prompt.

PROGRESS REPORT CONTENT

- Flight Number
- Arrival Airport Ident
- Destination Runway Ident
- Predicted remaining fuel
- ETA at destination
- Reason for report (specific event, ground request...).

FLIGHT PLAN REPORT

The F-PLN report broadcasts flight plan data to the ground. Only data from the active flight plan can be sent.

This downlink message is sent to the ground:
- Automatically following a ground request
- Manually by the crew using a prompt displayed on the ACARS FUNCTION page. (Refer to ACARS page description). This prompt may be invalidated through the navigation database policy file.

The Flight Plan report can be downlinked either while on ground or in flight during any flight phase.

FLIGHT PLAN REPORT CONTENT

The report contains the active and alternate flight plan.

PERFORMANCE DATA REPORT

The Performance Data report is a downlink message that allows the transmission of performance data (GW, FUEL, CG...) relative to the active F-PLN.
This message is automatically sent following a ground request. Manual sending is not possible.

PERFORMANCE DATA REPORT CONTENT

Sends to the ground:
- Current GW
- Cruise Altitude

- Current CG
- Fuel on Board
- Block Fuel
- Reserve Fuel
- Cost Index
- Top of Climb Temperature
- Climb Transition Altitude
- Tropopause Altitude
- Taxi Fuel
- ZFW
- ZFWCG

AIRCRAFT SYSTEMS

AUTO FLIGHT - PRINT INTERFACE

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Print Function....................A
AOC/Printer Programming Options....................B

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PRINT FUNCTION

Ident.: DSC-22_46-00001407.0004001 / 01 MAR 18
Applicable to: ALL

The print function enables several types of data and report to be printed:
- Flight plan initialization data
- Takeoff data
- Wind data
- Preflight report
- In flight report
- Post flight report

The 3 first reports may differ when automatically or manually printed for the following reason:
- The automatic process prints the uplink message although the manual process prints the current active data as displayed on the relevant MCDU pages.
- The last 3 reports being processed from the same sources are identical in automatic or manual printing.

Note: *AOC is not necessary linked to printing process. The printing function may be activated within the FMGES and selected independently from the AOC.*

- One or several print functions may be deactivated.
- If an AOC function is not active, (not selected in the NAV database policy file) the printing process is invalidated for this specific AOC function.

AOC/PRINTER PROGRAMMING OPTIONS

Ident.: DSC-22_46-00003947.0001001 / 15 FEB 11
Applicable to: ALL

Option programming for the AOC/PRINTER functions is obtained through the Navigation Data Base policy file or the Airline Modifiable Information (AMI) file.
The list summarizes the possible options :

Data Link (ACARS or AOC) Inhibit	Disables AOC functions
F-PLN Data Request Inhibit	Disables uplink and downlink requests of F-PLN initialization data
Performance Data Request Inhibit	Disables uplink and downlink requests of Performance Initialization data
Takeoff Data Request Inhibit	Disables uplink and downlink request of Takeoff Initialization data
Wind Data Request Inhibit	Disables uplink and downlink request of predicted wind data
Flight Number Enable	Flight Number is included within the F-PLN Request or Progress Report downlinks

Position Report Inhibit	Disables a manual Position Report downlink
Progress Report Triggers	Defines the triggers for the automatic downlink of the Progress Report
F-PLN Report Inhibit	Disables the manual downlink of the F-PLN Report
Auto Print of ACARS or AOC uplinks	Selects/Deselects the automatic printing of the F-PLN, INIT, TO and wind data uplinks. If Autoprint is selected, the crew can deselect it manually. If auto printing is deselected, the crew cannot manually reselect it.
Auto Print of Flight Reports	Selects/Deselects the automatic printing of the Preflight, Inflight, Postflight reports. If selected, the crew can deselect it manually. If autoprint is deselected, the crew cannot manually preselected it.

AIRCRAFT SYSTEMS

COMMUNICATIONS

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DSC-23-10 General

DSC-23-10-10 Introduction

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Communication System Architecture......B

DSC-23-10-20 Radio Tuning

Description......A
Radio Management Panel......B

DSC-23-10-30 Intercommunication System

Audio Management System......A
Cabin Intercommunication Data System......B

DSC-23-10-40 Cockpit Voice Recorder

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Controls and Indicators......B

DSC-23-10-50 Controls

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Side Stick Radio Selector......B
Loudspeaker Volume Knob......C
Audio Switching......D

DSC-23-20 Internal Communication

DSC-23-20-10 Flight Crew Interphone System

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DSC-23-20-20 Cabin Interphone System

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Cabin Call System......B

DSC-23-20-30 Service Interphone System

Introduction......A
Ground Mechanic Call......B

DSC-23-20-40 Passenger Address

Passenger Address......A

Continued on the following page

Continued from the previous page

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DSC-23-30-10 Radio Communication

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HF..C
SELCAL (Selective Calling)..D

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DSC-23-30-20-10 General

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DSC-23-40-30 Emergency Locator Transmitter

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DSC-23-47 Onboard Mobile Telephony System

Onboard Mobile Telephony System ....A

DSC-23-49 MEMO Display

CIDS..A

DSC-23-50 How to

VHF, HF Utilization..A

INTRODUCTION

Ident.: DSC-23-10-10-00026528.0001001 / 15 NOV 23
Applicable to: ALL

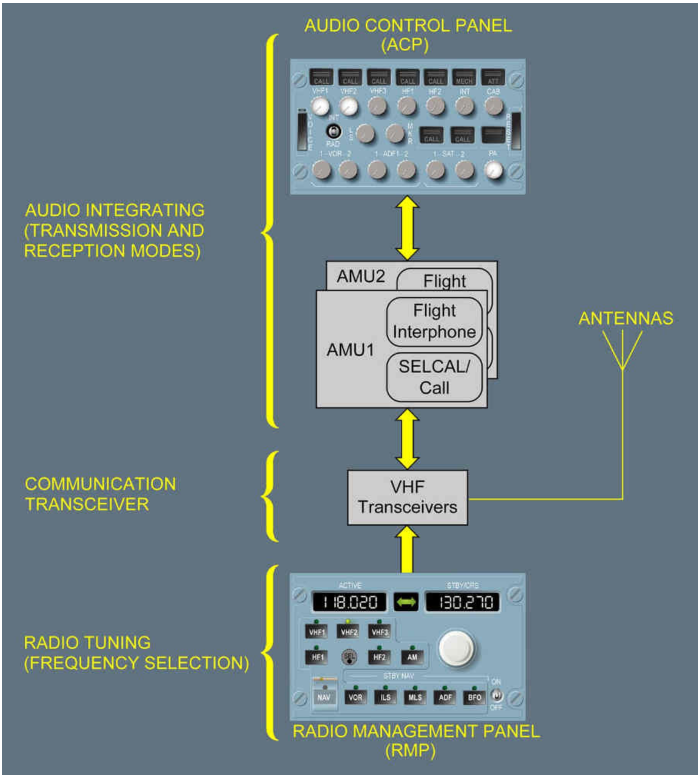
The communication system enables:
- Internal communication between the:
  - Flight crew and additional cockpit occupant(s)
  - Cabin crew
  - Ground crew
  - Passengers (i.e. for flight or cabin crew announcements).

  Internal communication is possible via the flight, cabin, and service interphones, and via the Passenger Address (PA).
- External communication via radio communication (HF or VHF) or Satellite Communication (SATCOM ◁), either in voice mode or data mode.

COMMUNICATION SYSTEM ARCHITECTURE

Ident.: DSC-23-10-10-00019801.0001001 / 15 NOV 23
Applicable to: ALL

The communications system comprises the following subsystems:
- VHF / HF transceivers
- Radio tuning systems (Radio Management Panels)
- Audio integrating system (Audio Management Unit, Audio Control Panels)

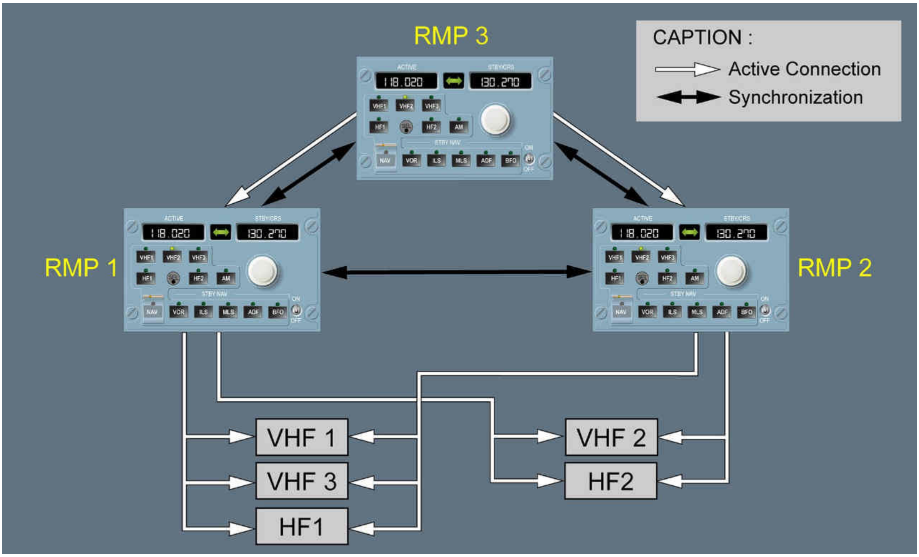

AUDIO CONTROL PANEL
(ACP)
AUDIO INTEGRATING
(TRANSMISSION AND
RECEPTION MODES)
AMU2
Flight
AMU1
Flight
Interphone
SELCAL/
Call
ANTENNAS
COMMUNICATION
TRANSCEIVER
VHF
Transceivers
RADIO TUNING
(FREQUENCY SELECTION)
ACTIVE
STBY/CRS
118.020
130.270
VHF1
VHF2
VHF3
HF1
SEL
HF2
AM
STBY NAV
NAV
VOR
ILS
MLS
ADF
BFO
ON
OFF
RADIO MANAGEMENT PANEL
(RMP)

DESCRIPTION

Ident.: DSC-23-10-20-00000038.0003001 / 05 MAR 19
Applicable to: ALL

Identical RMPs :
- Give the flight crew control of all radio communication systems (VHF and HF frequency control).
- Provide backup to the FMGECs for controlling radio navigation systems (*Refer to DSC-34-10-30-10 General*).

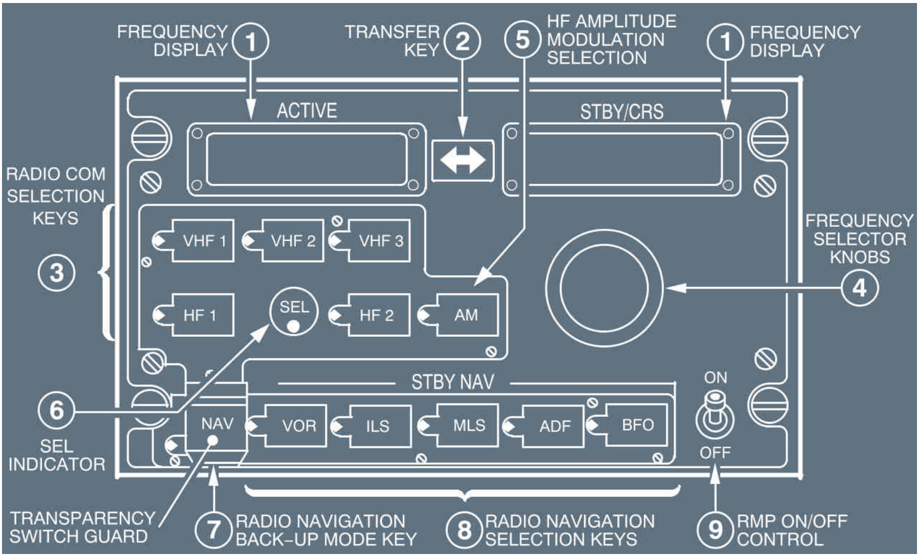
Two RMPs are on the center pedestal, and a third on the overhead panel.
Each RMP can control any VHF or HF transceiver. RMP1 and 2 are connected directly to all VHF and HF transceivers, whereas RMP3 is connected to them via RMP1 and 2. RMPs are connected together so that each RMP is updated with the selections made on other RMPs.
Only RMP1 functions in EMER ELEC CONFIG.



If two RMPs fail, the remaining one controls all the VHF and HF transceivers.

RADIO MANAGEMENT PANEL

Ident.: DSC-23-10-20-00000041.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU


FREQUENCY DISPLAY 1
TRANSFER KEY 2
5 HF AMPLITUDE MODULATION SELECTION
1 FREQUENCY DISPLAY
ACTIVE
STBY/CRS
RADIO COM SELECTION KEYS
3
VHF 1
VHF 2
VHF 3
HF 1
SEL
HF 2
AM
FREQUENCY SELECTOR KNOBS
4
6
SEL INDICATOR
STBY NAV
ON
NAV
VOR
ILS
MLS
ADF
BFO
OFF
TRANSPARENCY SWITCH GUARD
7 RADIO NAVIGATION BACK-UP MODE KEY
8 RADIO NAVIGATION SELECTION KEYS
9 RMP ON/OFF CONTROL

(1) Frequency displays

- The ACTIVE display window shows the active frequency of the selected radio, which is identified by a green light on the selection key.
- The STBY/CRS (standby / course display) display window shows a standby frequency that the pilot can activate by pressing the transfer key or change by rotating the tuning knobs. For a description of the CRS function *Refer to DSC-34-10-30-30 Radio Management Panel (RMP)*.

(2) Transfer key

Pressing this key moves the active frequency to the standby window and the standby frequency to the active window.
This tunes the selected receiver to the new active frequency.

(3) Radio comm. selection keys

When the pilot presses one of these keys:
- The ACTIVE window displays the frequency set on that radio.
- The STBY/CRS window displays the selected frequency or course.
- The selected key displays a green monitor light.

(4) Frequency selector knobs
The pilot uses these concentric knobs to select the STBY frequency or CRS.
The outer knob controls whole numbers; the inner knob controls decimal fractions.

(5) AM pushbutton switch
If the aircraft has HF radios and the flight crew has selected an HF tranceiver, this switch selects the AM mode. (The default mode is the SSB, or single side-band, mode).
This key displays a green monitor light when the AM mode is active.

(6) SEL indicator

The SEL indicator comes on in amber on both RMPs when a transceiver normally associated with one RMP is tuned by another:
- VHF1 tuned by RMP2 or 3,
- VHF2 tuned by RMP1 or 3,
- VHF3, HF1, HF2 ◁ tuned by RMP1 or 2.

(7) NAV pushbutton switch (with transparent switchguard)
The pilot presses this key to be able to select navigation receivers and courses through the RMP. It does not affect the selection of communication radios and their frequencies *Refer to DSC-34-10-30-30 Radio Management Panel (RMP)* for additional information.

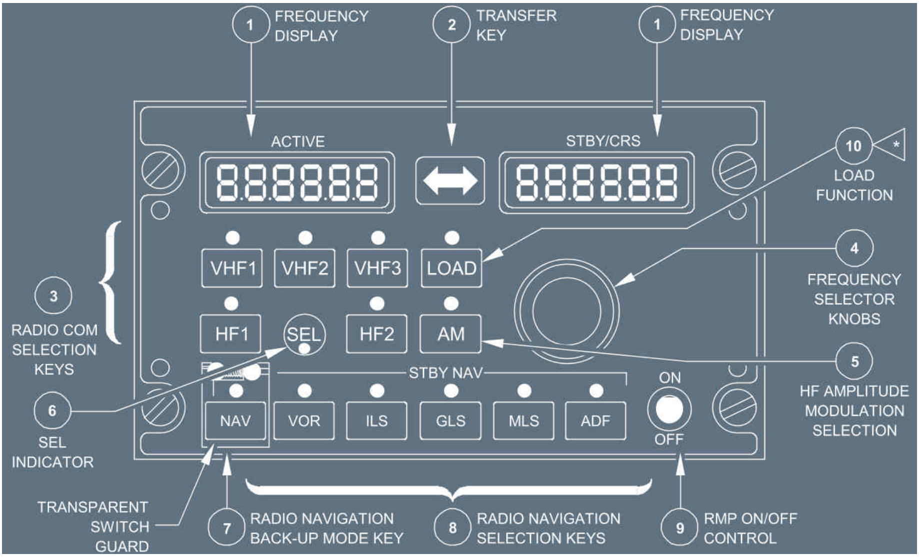
(8) Radio navigation selection keys
The pilot presses one of these keys to select a navigation radio to control through this RMP.
This turns on the green monitor light in the key.
Refer to DSC-34-10-30-30 Radio Management Panel (RMP) for additional information.

(9) ON/OFF switch
This switch controls the power supply of the RMP.

Note: *RMP3 is able to control VHF and HF transceivers through RMP1 and RMP2 even when they are OFF.*

RADIO MANAGEMENT PANEL

Ident.: DSC-23-10-20-00000041.0003001 / 06 DEC 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF


1 FREQUENCY DISPLAY
2 TRANSFER KEY
1 FREQUENCY DISPLAY
ACTIVE
STBY/CRS
888888
888888
10 LOAD FUNCTION
VHF1
VHF2
VHF3
LOAD
4 FREQUENCY SELECTOR KNOBS
3 RADIO COM SELECTION KEYS
HF1
SEL
HF2
AM
5 HF AMPLITUDE MODULATION SELECTION
STBY NAV
ON
OFF
6 SEL INDICATOR
NAV
VOR
ILS
GLS
MLS
ADF
TRANSPARENT SWITCH GUARD
7 RADIO NAVIGATION BACK-UP MODE KEY
8 RADIO NAVIGATION SELECTION KEYS
9 RMP ON/OFF CONTROL

(1) Frequency displays

- The ACTIVE display window shows the active frequency of the selected radio, which is identified by a green light on the selection key.
- The STBY/CRS (standby / course display) display window shows a standby frequency that the pilot can activate by pressing the transfer key or change by rotating the tuning knobs. For a description of the CRS function *Refer to DSC-34-10-30-30 Radio Management Panel (RMP)*.

(2) Transfer key
Pressing this key moves the active frequency to the standby window and the standby frequency to the active window.
This tunes the selected receiver to the new active frequency.

(3) Radio comm. selection keys

When the pilot presses one of these keys:
- The ACTIVE window displays the frequency set on that radio.
- The STBY/CRS window displays the selected frequency or course.
- The selected key displays a green monitor light.

(4) Frequency selector knobs
The pilot uses these concentric knobs to select the STBY frequency or CRS.
The outer knob controls whole numbers; the inner knob controls decimal fractions.

(5) AM pushbutton
If the aircraft has HF radios and the flight crew has selected an HF tranceiver, this switch selects the AM mode. (The default mode is the SSB, or single side-band, mode).
This key displays a green monitor light when the AM mode is active.

(6) SEL indicator

The SEL indicator comes on in amber on both RMPs when a transceiver normally associated with one RMP is tuned by another:
- VHF1 tuned by RMP2 or 3,
- VHF2 tuned by RMP1 or 3,
- VHF3, or HF tuned by RMP1 or 2.

(7) NAV pushbutton switch (with transparent switchguard)
The pilot presses this key to be able to select navigation receivers and courses through the RMP. It does not affect the selection of communication radios and their frequencies *Refer to DSC-34-10-30-30 Radio Management Panel (RMP)* for additional information.

(8) Radio navigation selection keys
The pilot presses one of these keys to select a navigation radio to control through this RMP. This turns on the green monitor light in the key.
Refer to DSC-34-10-30-30 Radio Management Panel (RMP) for additional information.

(9) ON/OFF switch
This switch controls the power supply of the RMP.

Note: *RMP3 is able to control VHF and HF transceivers through RMP1 and RMP2 even when they are OFF.*

(10) LOAD FUNCTION ◁
When the ATC sends (CONTACT or MONITOR) CPDLC messages to the flight crew, a white light above the LOAD key comes on to indicate that the sent frequency is available to be loaded.

Press on this LOAD key before closing the CONTACT/MONITOR messages to load this VHF frequency to the STBY/CRS window.

Note: *When a frequency from the ATC services (sent via datalink) has been received, the ATSU validates the frequency and simultaneously sends the information to all the RMP in order to activate the LOAD function.*
When the LOAD function is activated, the flight crew can repeatedly load the frequency on each RMP as often as necessary; except if DATA is present on standby window.

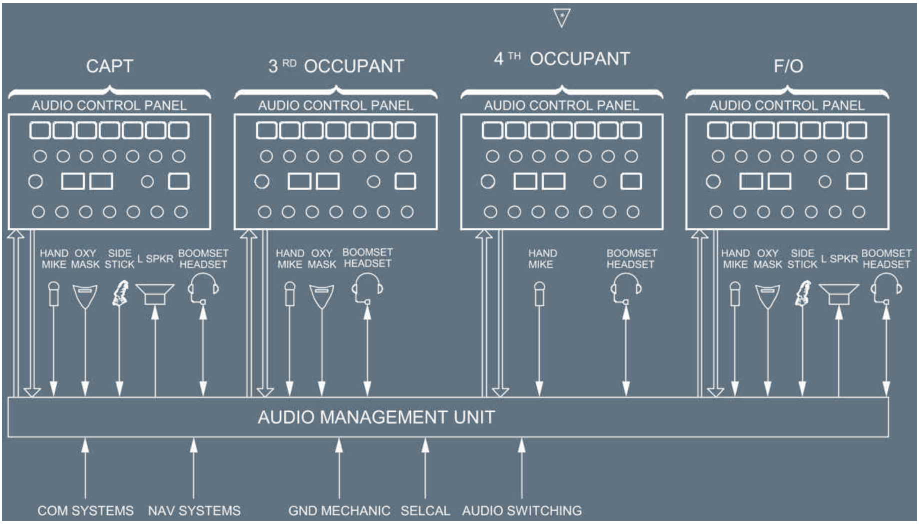
AUDIO MANAGEMENT SYSTEM

Ident.: DSC-23-10-30-00019154.0001001 / 17 MAR 17
Applicable to: ALL

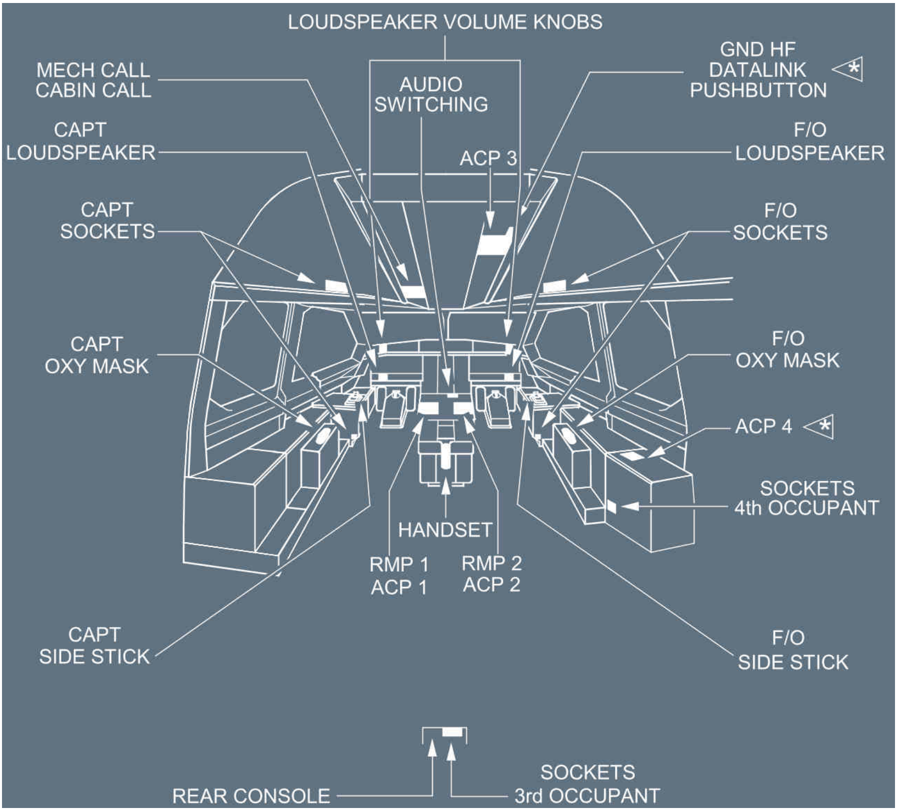
The audio management system allows the flight crew to use :
- all the radio communication and radio navigation facilities installed on the aircraft in transmission and reception mode.
- the interphone systems
- the call systems
- the passenger address system

The audio management system includes :
- an audio management unit (AMU)
- three or four audio control panels (ACPs)
- sockets at each pilot's station
    - headset jack, boomset connector and hand microphone connector for pilot, copilot, third and fourth occupant ◁
    - headset jack for the fourth occupant
- one interphone jack socket at the ground power receptacle
- boomsets for the pilot, copilot, third and fourth occupant ◁ and three or four hand microphones ◁ .
- three cockpit oxygen mask microphones
- one radio press-to-talk switch on each sidestick
- one SELCAL code selection panel
- two cockpit loudspeakers with separate volume controls
- an audio switching facility

If audio channel 1 or 2 fails due to a failure either in an ACP or the corresponding AMU, the crew can use the AUDIO SWITCHING selector to select the third audio channel.


CAPT
3 RD OCCUPANT
4 TH OCCUPANT
F/O
AUDIO CONTROL PANEL
AUDIO CONTROL PANEL
AUDIO CONTROL PANEL
AUDIO CONTROL PANEL
HAND MIKE
OXY MASK
SIDE STICK
L SPKR
BOOMSET HEADSET
HAND MIKE
OXY MASK
BOOMSET HEADSET
HAND MIKE
BOOMSET HEADSET
HAND MIKE
OXY MASK
SIDE STICK
L SPKR
BOOMSET HEADSET
AUDIO MANAGEMENT UNIT
COM SYSTEMS
NAV SYSTEMS
GND MECHANIC
SELCAL
AUDIO SWITCHING

COMPONENTS' LOCATION


LOUDSPEAKER VOLUME KNOBS
MECH CALL
CABIN CALL
AUDIO
SWITCHING
GND HF
DATALINK
PUSHBUTTON
CAPT
LOUDSPEAKER
ACP 3
F/O
LOUDSPEAKER
CAPT
SOCKETS
F/O
SOCKETS
CAPT
OXY MASK
F/O
OXY MASK
ACP 4
SOCKETS
4th OCCUPANT
HANDSET
RMP 1
ACP 1
RMP 2
ACP 2
CAPT
SIDE STICK
F/O
SIDE STICK
REAR CONSOLE
SOCKETS
3rd OCCUPANT

CABIN INTERCOMMUNICATION DATA SYSTEM

Ident.: DSC-23-10-30-00019806.0001001 / 03 OCT 17

Applicable to: ALL

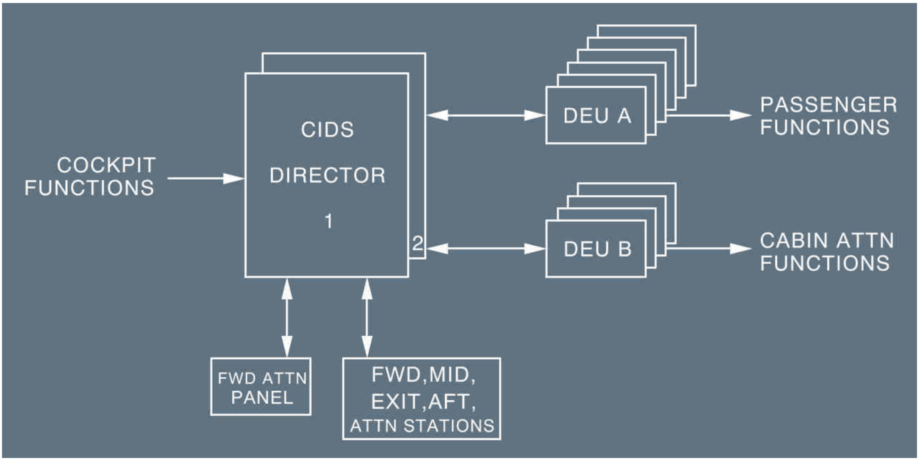
The Cabin Intercommunication Data System (CIDS) provides signal transmission, control and processing for the following cabin systems:

- Cabin and service interphone
- Passenger address
- Passenger signs
- Reading lights
- General cabin illumination

- Emergency evacuation signalling
- Lavatory smoke indication
- Passenger entertainment system.

The CIDS includes the following main components:

- Two CIDS directors connected in parallel, one active and the other on standby
- Forward Attendant Panel (FAP) to monitor and control the cabin systems.
  It also includes a programming and test module which allows reprogramming in case of cabin configuration changes
- Attendant stations (FWD, MID, EXIT, AFT)
- Decoder / Encoder Units (DEUs) linked to the two directors:
  - Type A units (for passengers) installed in three rows (left, center, right).
    The loudspeakers, lighted signs, call buttons, call lights and general illumination ballast units are divided into small groups, each connected to a type A DEU
  - Type B units (for attendants) installed on each cabin side. The Area Call panels, attendant handsets, slide / door pressure sensors, attendant indicator panels, are connected to type B DEUs.


COCKPIT FUNCTIONS
CIDS
DIRECTOR
1
2
DEU A
PASSENGER FUNCTIONS
DEU B
CABIN ATTN FUNCTIONS
FWD ATTN PANEL
FWD,MID, EXIT,AFT, ATTN STATIONS

DESCRIPTION

Ident.: DSC-23-10-40-00019179.0001001 / 03 NOV 22
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The CVR records:
- Direct conversations between crew members in the cockpit
- All aural warnings sounded in the cockpit
- Audio communications received and transmitted
- Intercommunications conversations between crew members
- Announcements transmitted over the PA system, if PA reception is selected on at least one ACP.

Only the last 2 h of recording are retained.

The CVR system consists of:
- A remote microphone behind overhead panel
- A “hot mike” function, which records the crew members voice directly from their microphone, even if the PTT pb is not activated
- A crashproof four-track recorder, equipped with an ULB, in the aft section of the aircraft
- A control panel on the overhead panel.

The CVR is recording automatically:
- On ground during the first 5 min after the aircraft electrical network is energized
- On ground with one engine running
- In flight
- On ground until 5 min after the last engine shutdown.

On ground, when GND CTL pb-sw is pressed, the CVR is recording.

DESCRIPTION

Ident.: DSC-23-10-40-00019179.0002001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

The CVR records:
- Direct conversations between crew members in the cockpit
- All aural warnings sounded in the cockpit
- Audio communications received and transmitted
- Datalink communications received and transmitted
- Intercommunications conversations between crew members
- Announcements transmitted over the PA system, if PA reception is selected on at least one ACP.

Only the last 2 h of recording are retained.

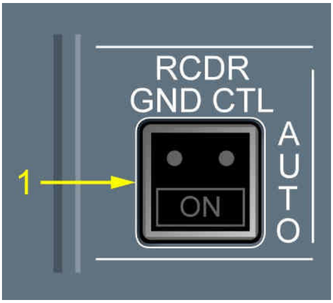
The CVR system consists of:
- A remote microphone behind overhead panel
- A “hot mike” function, which records the crew members voice directly from their microphone, even if the PTT pb is not activated
- A crashproof four-track recorder, equipped with an ULB, in the aft section of the aircraft
- A control panel on the overhead panel.

The CVR is recording automatically:
- On ground during the first 5 min after the aircraft electrical network is energized
- On ground with one engine running
- In flight
- On ground until 5 min after the last engine shutdown.

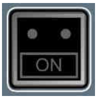
On ground, when GND CTL pb-sw is pressed, the CVR is recording.

CONTROLS AND INDICATORS

Ident.: DSC-23-10-40-10-00019180.0001001 / 30 AUG 18
Applicable to: ALL



(1) RCDR GND CTL pb-sw

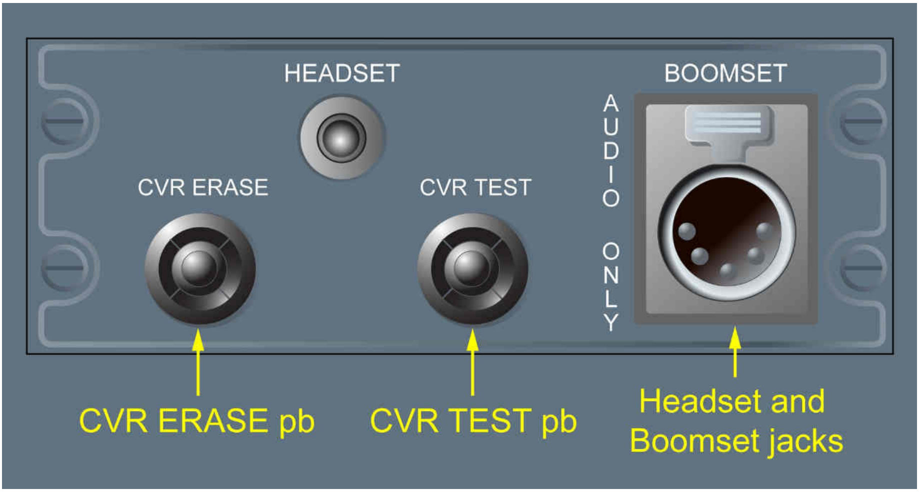


The CVR, DFDR, and QAR ◁ automatically operate (AUTO), according to the logic (*Refer to DSC-23-10-40 Description*).

The flight crew manually starts the CVR, DFDR, and QAR ◁ .
After engine start, the ON light goes off and the recorders automatically operate.

Note: *The RCDR GND CTL pb-sw may revert to AUTO (active or inactive, according to the logic) during an electrical transient.*

Ident.: DSC-23-10-40-10-00019181.0002001 / 04 SEP 18
Applicable to: LV-GHQ, LV-GIF


HEADSET
BOOMSET
CVR ERASE
CVR TEST
AUDIO ONLY
CVR ERASE pb
CVR TEST pb
Headset and
Boomset jacks

CVR TEST PB

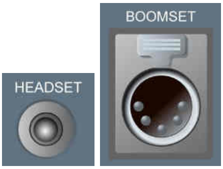
When pressed:
This activates the test, if the CVR is energized.
If an acoustic equipment is plugged into the jack (HEADSET or BOOMSET), the flight crew will hear as low frequency signal.
If the test is not successful, the ECAM triggers the RECORDER CVR FAULT alert 5 s after the pushbutton is pressed.

CVR ERASE PB

When pressed for 2 s, the CVR ERASE function ◁ erases the CVR full recording, if:

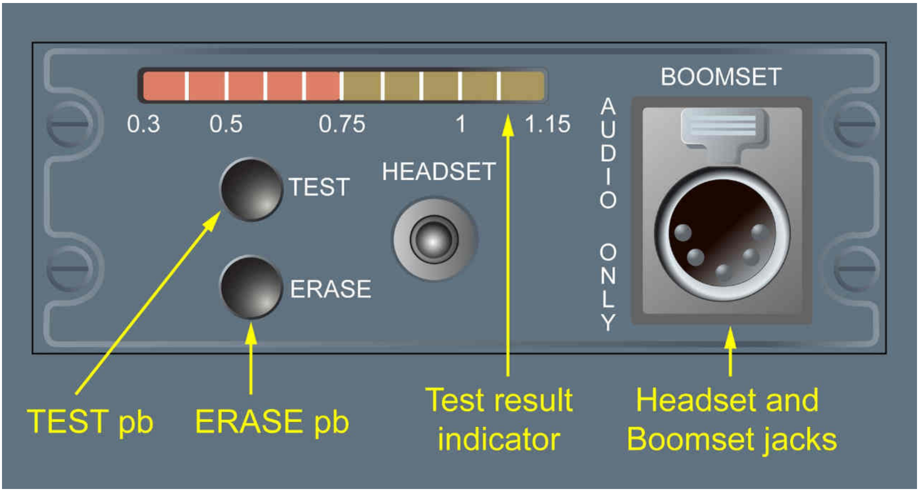
- The aircraft is on ground, and
- The parking brake is on.

HEADSET AND BOOMSET JACKS


BOOMSET
HEADSET

When a headset or boomset is plugged into the jack:
- Cockpit sounds, picked up by the microphone, are audible
- The test tone is audible, when the TEST pushbutton is pressed
- The erase tone is audible when the ERASE pushbutton is pressed.

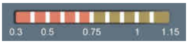
Ident.: DSC-23-10-40-10-00019181.0001001 / 04 SEP 18
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU


0.3
0.5
0.75
1
1.15
TEST
ERASE
HEADSET
AUDIO ONLY
BOOMSET
TEST pb
ERASE pb
Test result indicator
Headset and Boomset jacks

TEST PB

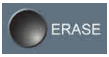
When pressed:
This activates the test, if the CVR is energized.
The result of the test is visible on the test result indicator.
If an acoustic equipment is plugged into the jack, the test will be heard as low-frequency signal.

TEST RESULT INDICATOR


0.3
0.5
0.75
1
1.15

Illumination of one or more green LEDs indicates that the test result is good.

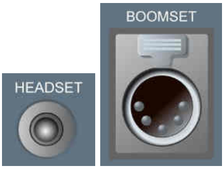
ERASE PB



When pressed for 2 s, the CVR ERASE function erases the CVR full recording, if:

- The aircraft is on the ground, and
- The parking brake is on.

HEADSET AND BOOMSET JACKS

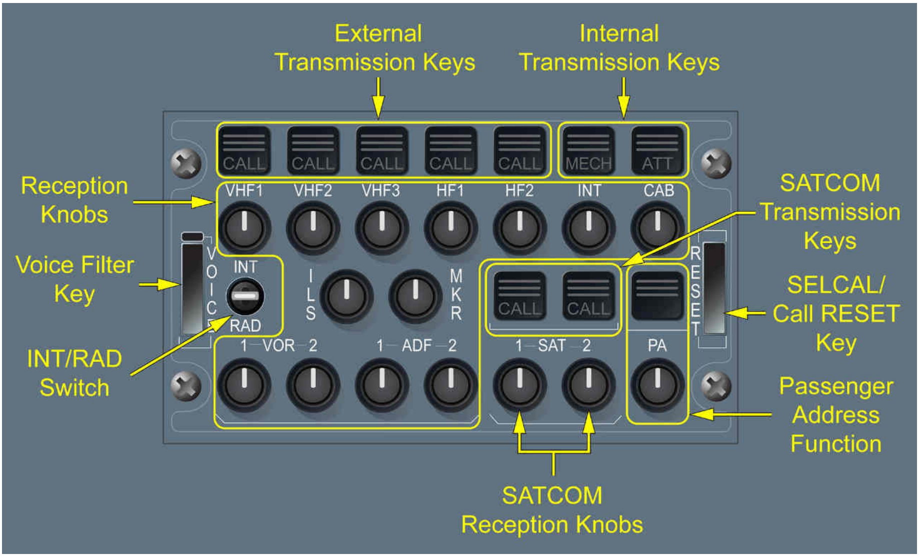


When a headset or boomset is plugged into the jack:
- Cockpit sounds, picked up by the microphone, are audible
- The test tone is audible, when the TEST pushbutton is pressed
- The erase tone is audible when the ERASE pushbutton is pressed.

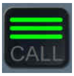
Intentionally left blank

AUDIO CONTROL PANEL

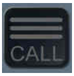
Ident.: DSC-23-10-50-00000075.0004001 / 05 MAY 22
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO


External Transmission Keys
Internal Transmission Keys
Reception Knobs
Voice Filter Key
INT/RAD Switch
SATCOM Transmission Keys
SELCAL/ Call RESET Key
Passenger Address Function
SATCOM Reception Knobs
CALL
CALL
CALL
CALL
CALL
MECH
ATT
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
VOICE
INT
RAD
ILS
MKR
CALL
CALL
RESET
1 VOR 2
1 ADF 2
1 SAT 2
PA

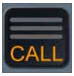
EXTERNAL TRANSMISSION KEYS



The associated communication means (i.e. VHF 1(2)(3), HF 1(2)) is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated channel.

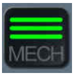


The associated communication means (i.e. VHF 1(2)(3), HF 1(2)) is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated channel.



Flashes to indicate an incoming of SELCAL.
When a SELCAL is received, a buzzer sounds in the cockpit until it is reset, via SELCAL/Call RESET Key.

INTERNAL TRANSMISSION KEYS (INT/CAB)



The INT interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.

The INT interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.

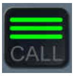
Flashes to indicate an incoming call from the ground crew.
The MECH light goes off after 60 s, if it is not reset.

The CAB interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.

The CAB interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.

Flashes to indicate an incoming call from the cabin crew.
The ATT light goes off after 60 s, if it is not reset.

SATCOM TRANSMISSION KEYS



Steady green light indicates when the associated SATCOM channel is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated SATCOM channel.
Flashing green light indicates the establishment of air to ground call of the associated SATCOM channel or the associated SATCOM call is on hold.

The associated SATCOM channel is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated SATCOM channel.

Flashes to indicate an incoming of call from ground via SATCOM channel.

SELCAL/CALL RESET KEY

When pressed, the buzzer sound is cancelled.

PASSENGER ADDRESS (PA) FUNCTION

Refer to DSC-23-20-40 Passenger Address - General.

SATCOM RECEPTION KNOBS

The associated SATCOM channel is not in reception mode. When pressed and released in the out position, the reception knob turns on the reception mode.

The associated SATCOM channel is in reception mode. When pressed and released in the in position, the reception knob turns off the reception mode.
When turned, the reception knob adjusts the volume of the headset.

Note: The ANN LT knob controls the brightness of the reception knob.

INT/RAD SWITCH

The flight crew uses the interphone/Radio Push-To-Talk switch (INT/RAD sw) to activate the boomset, or oxygen mask microphones.

The INT/RAD sw is in the off position.

When set to RAD, the INT/RAD sw activates the boomset or the oxygen mask microphone. However, the appropriate key should be selected first, in order to transmit the message.
When released, the INT/RAD sw returns to the off position.

When set to INT, the INT/RAD sw activates the boomset or the oxygen mask microphone.
When released, the INT/RAD sw remains in the INT position, until the flight crew selects another switch position.

VOICE FILTER KEY

VOICE filter key allows the flight crew to inhibit the most commonly used audio navigation signals (VOR, ADF ◁).

Audio filter function is not active. When pressed, the VOICE filter key turns on the IDENT signals filter.

Audio filter function is active. When pressed, the VOICE filter key turns off the IDENT signals filter.

RECEPTION KNOBS

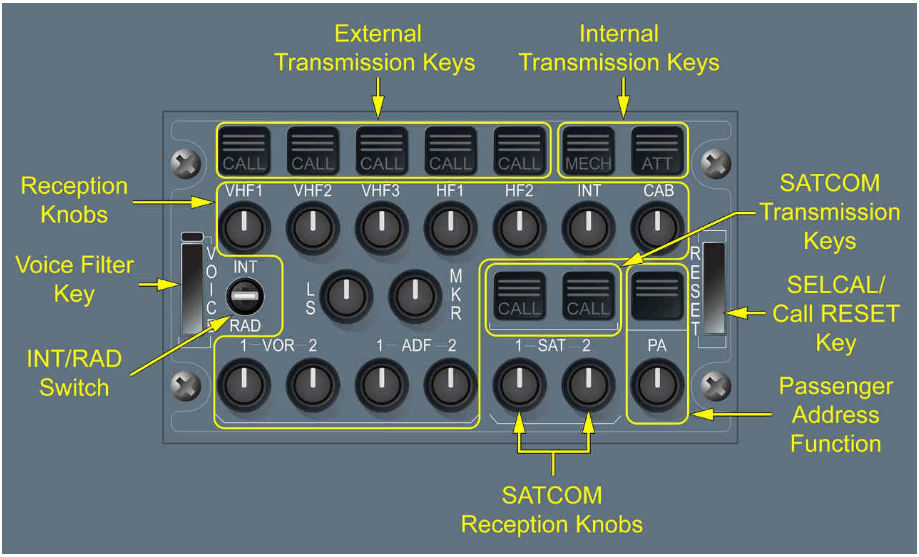
The associated communication means or interphone (i.e. VHF 1(2)(3), HF 1(2), INT, or CAB) is not in reception mode.
When pressed and released in the out position, the reception knob turns on the reception mode.

The associated communication means or interphone (i.e. VHF 1(2)(3), HF 1(2), INT, or CAB) is in reception mode.

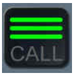
Note: *For the reception of DME audio navigation signals associated with an ILS station, the LS pb on the FCU must also be selected.*
The ANN LT knob controls the brightness of the reception knob.

AUDIO CONTROL PANEL

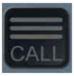
Ident.: DSC-23-10-50-00000075.0006001 / 05 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU


External Transmission Keys
Internal Transmission Keys
CALL
CALL
CALL
CALL
CALL
MECH
ATT
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
Reception Knobs
Voice Filter Key
INT/RAD Switch
VOICE
INT
RAD
LS
MKR
CALL
CALL
RESET
1 VOR 2
1 ADF 2
1 SAT 2
PA
SATCOM Transmission Keys
SELCAL/ Call RESET Key
Passenger Address Function
SATCOM Reception Knobs

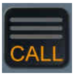
EXTERNAL TRANSMISSION KEYS



The associated communication means (i.e. VHF 1(2)(3), HF 1(2)) is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated channel.

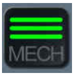


The associated communication means (i.e. VHF 1(2)(3), HF 1(2)) is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated channel.

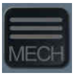


Flashes to indicate an incoming of SELCAL.
When a SELCAL is received, a buzzer sounds in the cockpit until it is reset, via SELCAL/Call RESET Key.

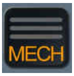
INTERNAL TRANSMISSION KEYS (INT/CAB)



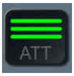
The INT interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.



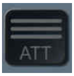
The INT interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.



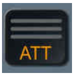
Flashes to indicate an incoming call from the ground crew.
The MECH light goes off after 60 s, if it is not reset.



The CAB interphone is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated interphone.

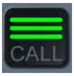


The CAB interphone is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated interphone.

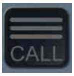


Flashes to indicate an incoming call from the cabin crew.
The ATT light goes off after 60 s, if it is not reset.

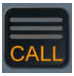
SATCOM TRANSMISSION KEYS



Steady green light indicates when the associated SATCOM channel is in transmission mode. When pressed, the transmission key turns off the transmission mode of the associated SATCOM channel.
Flashing green light indicates the establishment of air to ground call of the associated SATCOM channel or the associated SATCOM call is on hold.

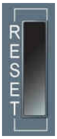


The associated SATCOM channel is not in transmission mode. When pressed, the transmission key turns on the transmission mode of the associated SATCOM channel.



Flashes to indicate an incoming of call from ground via SATCOM channel.

SELCAL/CALL RESET KEY

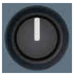


When pressed, the buzzer sound is cancelled.

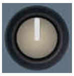
PASSENGER ADDRESS (PA) FUNCTION

Refer to DSC-23-20-40 Passenger Address - General.

SATCOM RECEPTION KNOBS



The associated SATCOM channel is not in reception mode. When pressed and released in the out position, the reception knob turns on the reception mode.

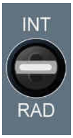


The associated SATCOM channel is in reception mode. When pressed and released in the in position, the reception knob turns off the reception mode.
When turned, the reception knob adjusts the volume of the headset.

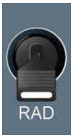
Note: The ANN LT knob controls the brightness of the reception knob.

INT/RAD SWITCH

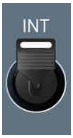
The flight crew uses the interphone/Radio Push-To-Talk switch (INT/RAD sw) to activate the boomset, or oxygen mask microphones.



The INT/RAD sw is in the off position.



When set to RAD, the INT/RAD sw activates the boomset or the oxygen mask microphone. However, the appropriate key should be selected first, in order to transmit the message.
When released, the INT/RAD sw returns to the off position.



When set to INT, the INT/RAD sw activates the boomset or the oxygen mask microphone.
When released, the INT/RAD sw remains in the INT position, until the flight crew selects another switch position.

VOICE FILTER KEY

VOICE filter key allows the flight crew to inhibit the most commonly used audio navigation signals (VOR, ADF ◁).

Audio filter function is not active. When pressed, the VOICE filter key turns on the IDENT signals filter.

Audio filter function is active. When pressed, the VOICE filter key turns off the IDENT signals filter.

RECEPTION KNOBS

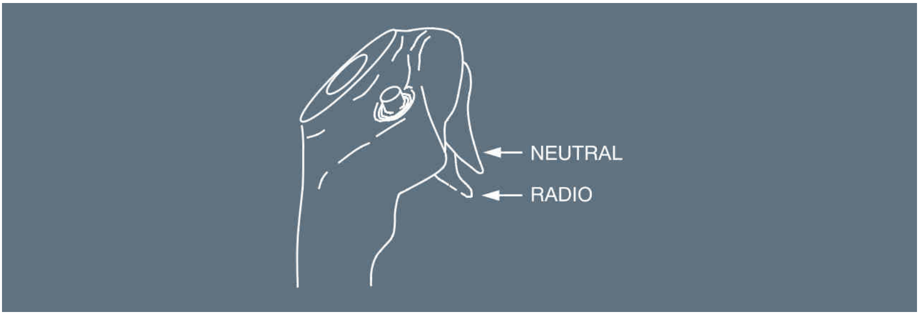
The associated communication means or interphone (i.e. VHF 1(2)(3), HF 1(2), INT, or CAB) is not in reception mode.
When pressed and released in the out position, the reception knob turns on the reception mode.

The associated communication means or interphone (i.e. VHF 1(2)(3), HF 1(2), INT, or CAB) is in reception mode.

Note: *For the reception of DME audio navigation signals associated with an ILS station, the LS pb on the FCU must also be selected.*
The ANN LT knob controls the brightness of the reception knob.

SIDE STICK RADIO SELECTOR

Ident.: DSC-23-10-50-00000079.0001001 / 21 MAR 17
Applicable to: ALL



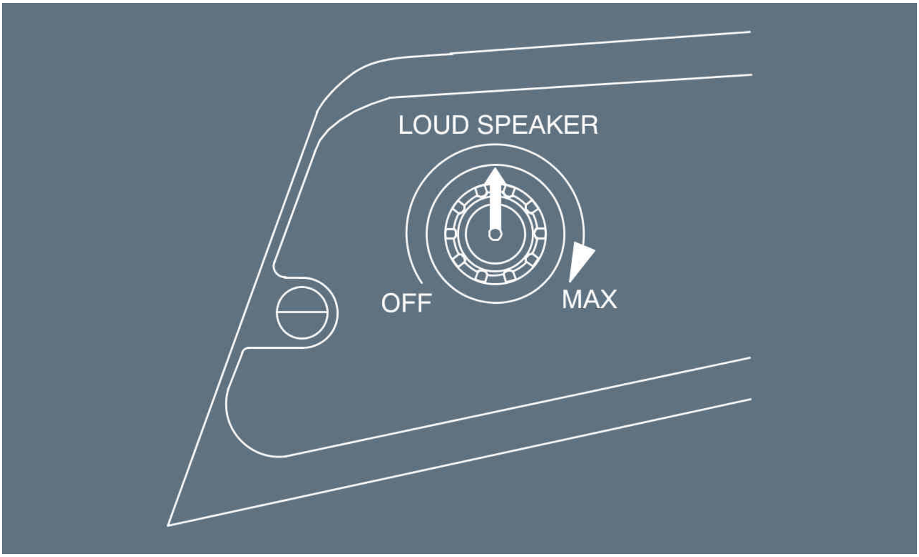
This selector has the same function as the INT/RAD switch on the ACP.

NEUTRAL (spring-loaded)	:	Boom and mask mikes are dead. Reception is normal.
RADIO (aft position)	:	Boom and mask mikes transmit the equipment selected by the transmission key on the ACP.

Note: *If RADIO is selected on the side stick when the INT/RAD switch is on INT, the radio function has priority over the interphone function.*

LOUDSPEAKER VOLUME KNOB

Ident.: DSC-23-10-50-00000081.0001001 / 21 MAR 17
Applicable to: ALL



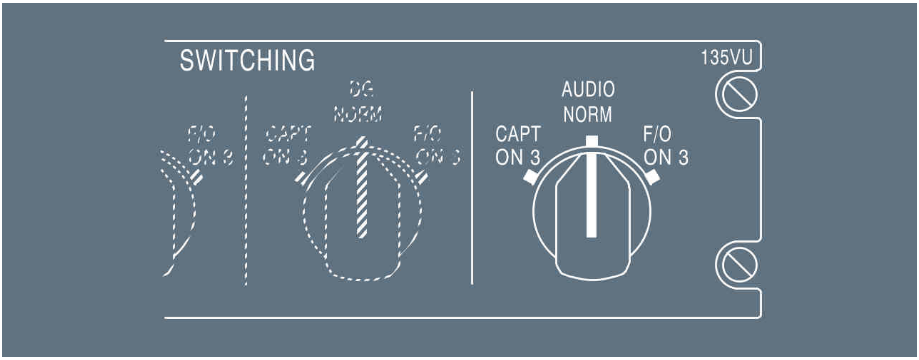
This knob adjusts the volume of the loudspeaker for radio communication.

OFF	:	Loudspeaker does not respond the signals from the aircraft's radio equipment.
Clockwise rotation	:	Loudspeaker broadcasts signal from the aircraft's radio equipment at increasing volume.

Note: *This knob does not control the loudness of aural alert and voice message. In the case of acoustic feedback (i.e. Larsen effect) from the cockpit loudspeaker, the flight crew should reduce the volume of the cockpit loudspeaker. However, the flight crew should ensure that the volume of the cockpit loudspeaker is sufficient to hear radio communication.*

AUDIO SWITCHING

Ident.: DSC-23-10-50-00000084.0001001 / 21 MAR 17
Applicable to: ALL


SWITCHING
135VU
DG
NORM
F/O
ON 3
CAPT
ON 3
F/O
ON 3
AUDIO
NORM
CAPT
ON 3
F/O
ON 3

The crew can switch to the third audio channel if ACP1 or ACP2 fails.
When the crew does this, it takes away the third occupant's access to the acoustic equipment.

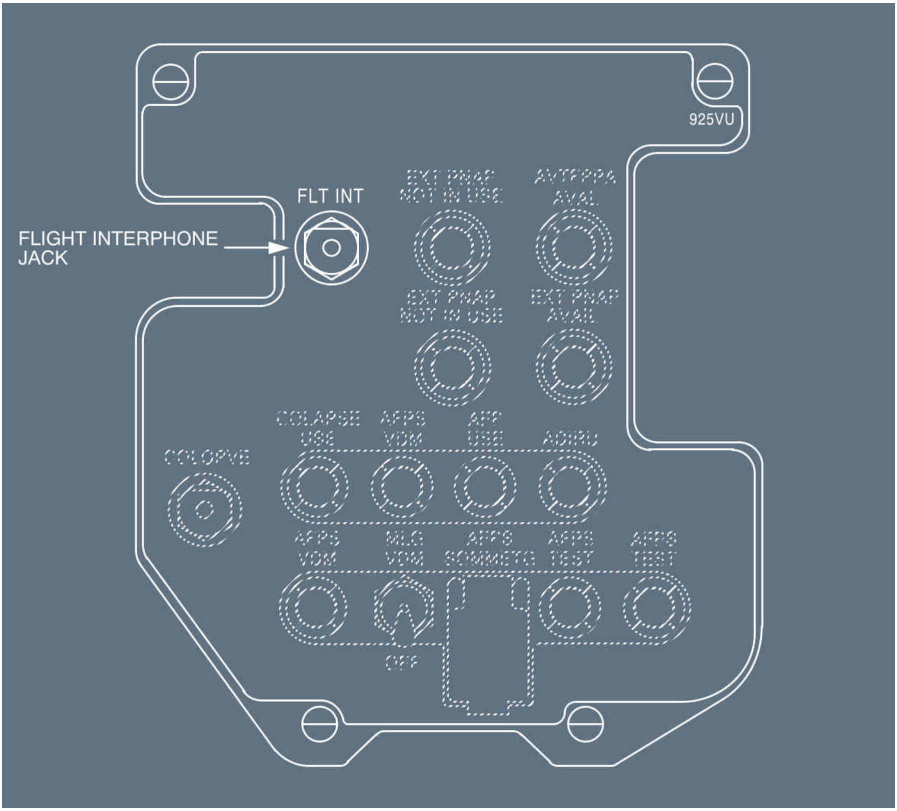
NORM :	Each crew member uses his dedicated communication equipment.
CAPT ON 3:	The pilot uses his acoustic equipment and the third occupant's ACP.
F/O ON 3 :	The copilot uses his acoustic equipment and the third occupant's ACP.

FLIGHT CREW INTERPHONE SYSTEM

Ident.: DSC-23-20-10-00019811.0001001 / 20 JUL 17
Applicable to: ALL

This system allows the flight crew to communicate among themselves and, through a jack on the external power panel, with the ground mechanic.

EXTERNAL POWER PANEL



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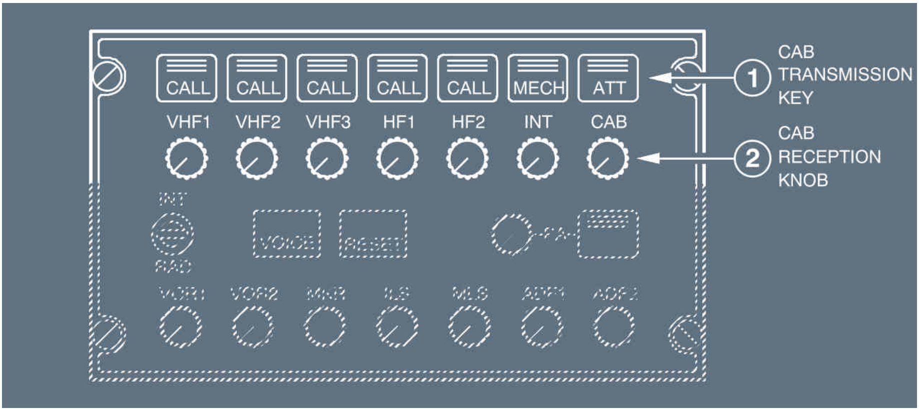
INTRODUCTION

Ident.: DSC-23-20-20-00019175.0001001 / 20 JUL 17
Applicable to: ALL

The system provides communication and call facilities between:
- Flight crew and attendant stations.
- Two attendant stations.

Note: *Cabin interphone monitoring may be deactivated in flight depending on CIDS customization.*


CALL
CALL
CALL
CALL
CALL
MECH
ATT
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
INT
RAD
VOICE
RESET
PA
VOR1
VOR2
MKR
ILS
MLS
ADF1
ADF2
1
CAB TRANSMISSION KEY
2
CAB RECEPTION KNOB

(1) CAB transmission key

Depressed : Three green lines come on.
Boomset, mask mikes and hand mike may be used for cabin interphone.

(2) CAB reception knob

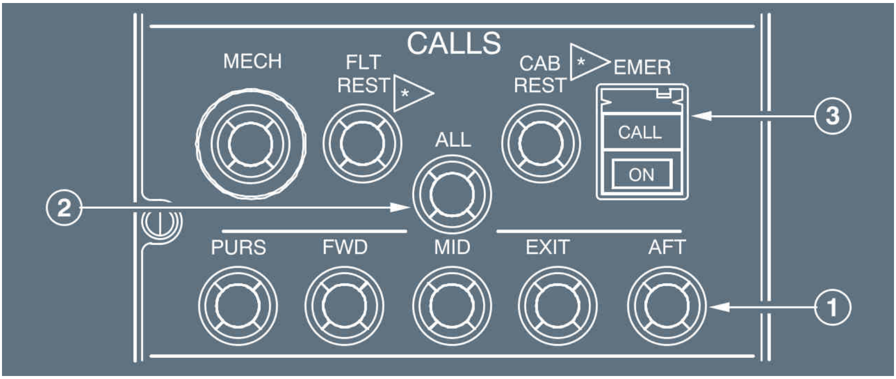
Depressed and released(knob out)	:	The integrated white light comes on. Audio signal from cabin is received. Rotate knob to adjust volume.
Depressed (knob in)	:	The white light goes off. Cabin interphone is disconnected.

CABIN CALL SYSTEM

Applicable to: ALL

Ident.: DSC-23-20-20-10-00019177.0001001 / 02 NOV 16

CALL FROM THE COCKPIT



(1) FLT REST ◁* /CAB REST ◁* /PURS/FWD/MID/EXIT/AFT pushbutton

Pressed: A steady pink light comes on, on the corresponding area call panel.
“CAPTAIN CALL” appears on the corresponding attendant indication panel, and a green light comes on.
A high–low chime sounds through corresponding loudspeaker.

Note: The FLT REST/CAB REST call button is operative, if the corresponding compartment is installed on the aircraft.

(2) ALL pb

Pressed: All stations respond as indicated above, and “CALL ALL CAPT” appears on the attendant indication panels.

(3) EMER pb-sw (Guarded)

ON : A red or pink light comes on, at all area call panels.
“CALL PRIO CAPT” appears on all attendant indication panels, and a red light comes on.
High–low chime is repeated three times, through all loudspeakers. The ATT flashes in amber, on the Audio Control Panels.

ON lt : This light comes on in white for an emergency call from the cockpit or the cabin.

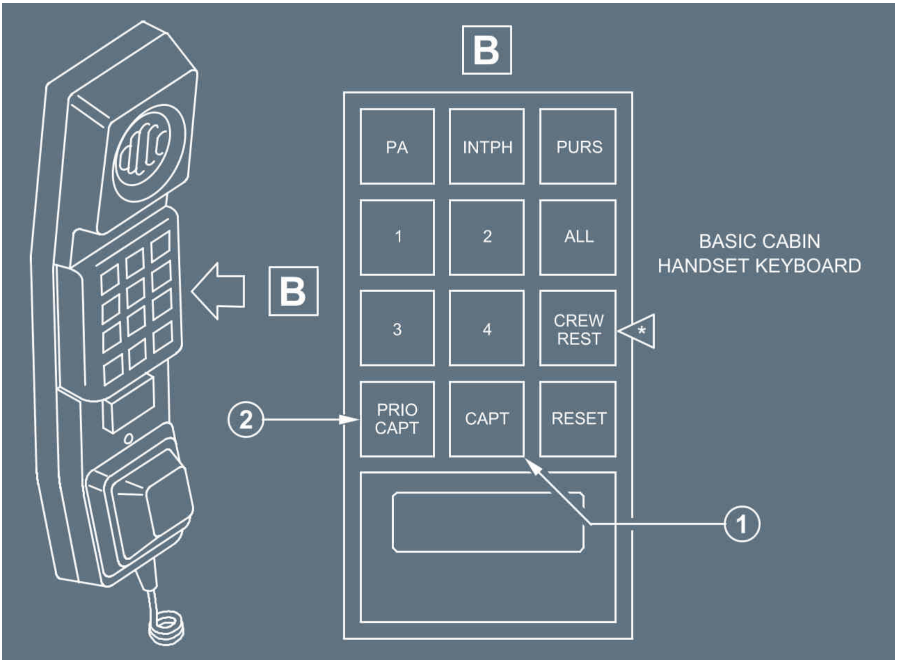
CALL lt : This light comes on in amber for an emergency call from the cockpit.

For an emergency call from the cabin to the cockpit:
- The amber CALL light flashes.
- The ATT flashes in amber on the audio control panels.
- The buzzer is repeated three times in the cockpit.

The system resets, when the attendant hangs up the associated handset.

Ident.: DSC-23-20-20-10-00019178.0001001 / 17 MAR 17

CALL FROM THE CABIN


B
B
PA
INTPH
PURS
1
2
ALL
3
4
CREW REST
*
PRIO CAPT
CAPT
RESET
BASIC CABIN HANDSET KEYBOARD
②
①

(1) CAPT key

Pressed: In the cockpit, the “ATT” lights up on the ACP, and a buzzer sounds.
In the cabin, “CAPTAIN” appears on the AIP, where the CAPT button was pressed. The buzzer is inhibited during takeoff and landing.

(2) PRIO CAPT key

Pressed: This key is used for emergency calls. In the cockpit, the “ATT” lights up on the ACP, and three buzzers sound.
In the cabin, “PRIO CAPTAIN” appears at the AIP, where the PRIO CAPT button was pressed. The buzzer is inhibited during takeoff and landing. On the CALLS panel, the white ON light and amber CALL light of the EMER pb-sw (guarded) flash.

INTRODUCTION

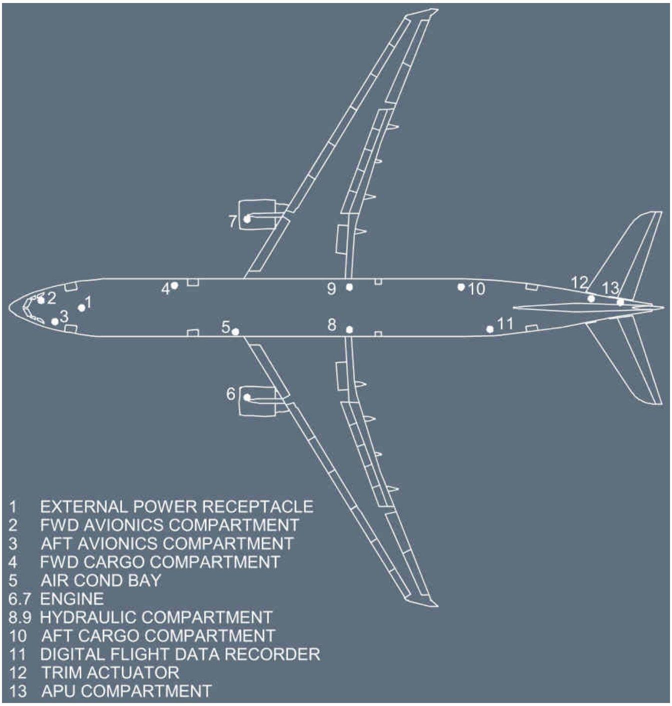
Ident.: DSC-23-20-30-00019812.0001001 / 20 JUL 17
Applicable to: ALL

The system provides communication between:
- The flight crew and the service interphone jacks.
- The flight attendant stations and the service interphone jacks.
- The different service interphone jacks.

The service interphone system comprises:
- Thirteen interphone jacks.
- An OVRD switch located on the overhead panel.

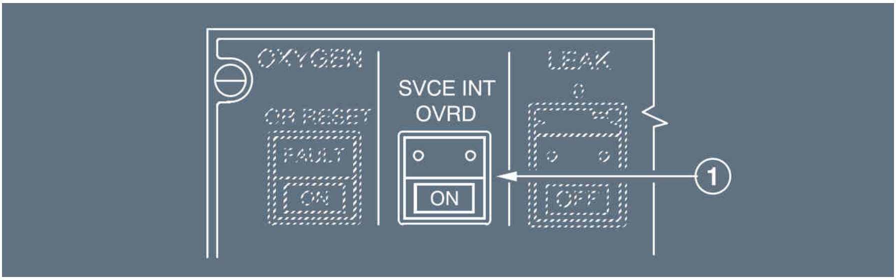
The audio lines from the interphone jacks are connected to both CIDS directors.

LOCATION OF INTERPHONE JACKS


7
6
4
2
3
1
5
9
8
10
11
12
13
1 EXTERNAL POWER RECEPTACLE
2 FWD AVIONICS COMPARTMENT
3 AFT AVIONICS COMPARTMENT
4 FWD CARGO COMPARTMENT
5 AIR COND BAY
6.7 ENGINE
8.9 HYDRAULIC COMPARTMENT
10 AFT CARGO COMPARTMENT
11 DIGITAL FLIGHT DATA RECORDER
12 TRIM ACTUATOR
13 APU COMPARTMENT

CONTROLS AND INDICATORS ON OVERHEAD PANEL

For maintenance purpose only.


OXYGEN
CR RESET
FAULT
ON
SVCE INT
OVRD
ON
LEAK
OFF
1

(1) SVCE INT OVRD pb sw

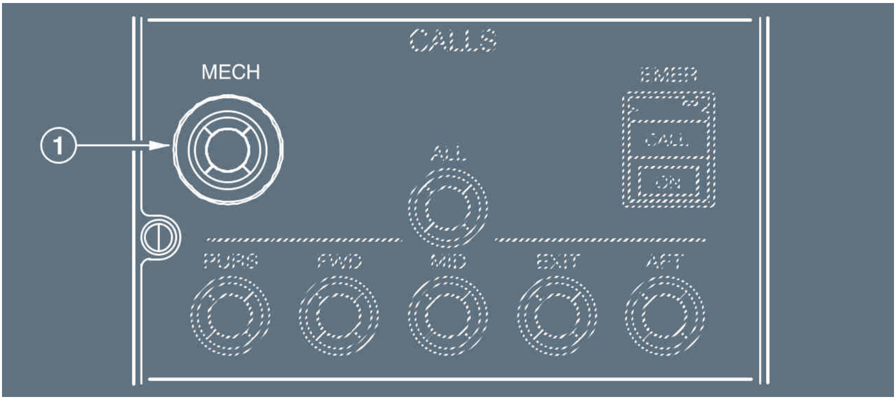
Auto:	Ground personnel can communicate with the flight crew by means of the service interphone jacks after the aircraft has landed. The landing gear must be compressed.
ON :	Communication is possible when the landing gear is not compressed. The ON light is white.

GROUND MECHANIC CALL

Ident.: DSC-23-20-30-00019813.0001001 / 17 MAR 17
Applicable to: ALL

The system allows the flight crew and ground mechanics to communicate each other.

CONTROLS AND INDICATORS ON OVERHEAD PANEL

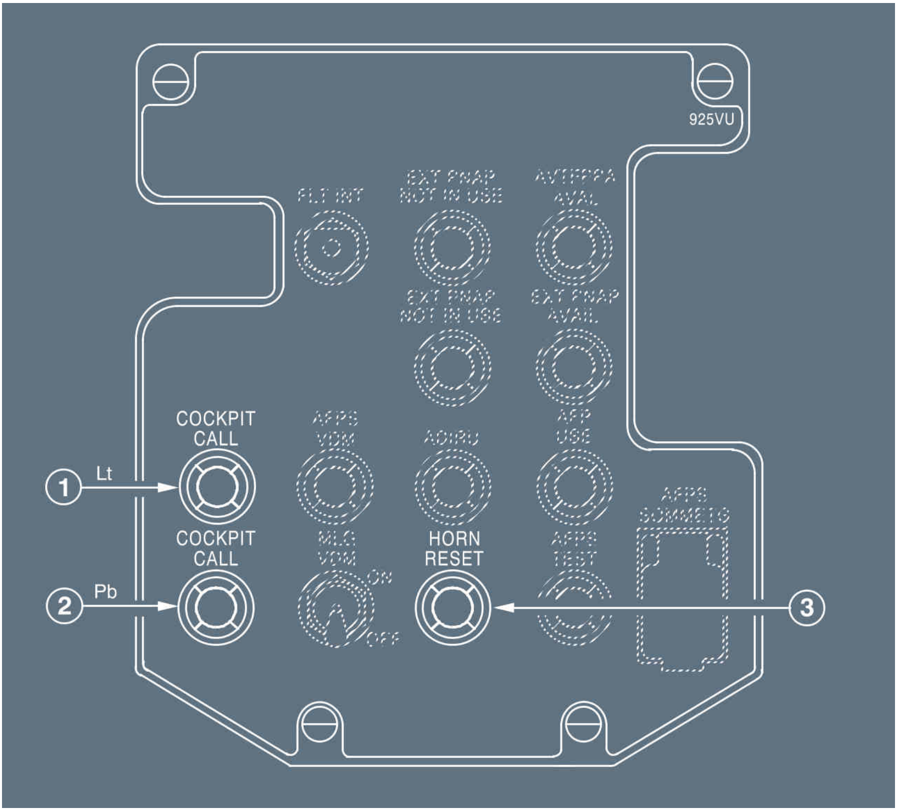

CALLS
MECH
1
EMER
CALL
ON
ALL
PURS
FWD
MID
EXIT
AFT

(1) MECH pb

Pressed (and held) : COCKPIT CALL lights up blue on the external power panel. An external horn sounds.

Released : COCKPIT CALL remains lighted. The ground mechanic can extinguish it by pressing the HORN RESET pb on the external power panel. The external horn stops sounding.

CONTROLS AND INDICATORS ON EXTERNAL POWER PANEL


925VU
FLT INT
EXT PWR NOT IN USE
EXT PWR NOT IN USE
EXT PWR AVAIL
COCKPIT CALL
① Lt
ADIRU
COCKPIT CALL
HORN RESET
② Pb
ON
OFF
③

(1) COCKPIT CALL lt
The blue light appears when cockpit calls the ground mechanic. An external horn also sounds.

(2) COCKPIT CALL pb

Pressed:	This calls the cockpit. The MECH lights flash amber on the ACPs and a buzzer sounds.
Released	The MECH lights go out after 60 s if they are not reset on the ACPs. The buzzer stops.

(3) HORN RESET pb

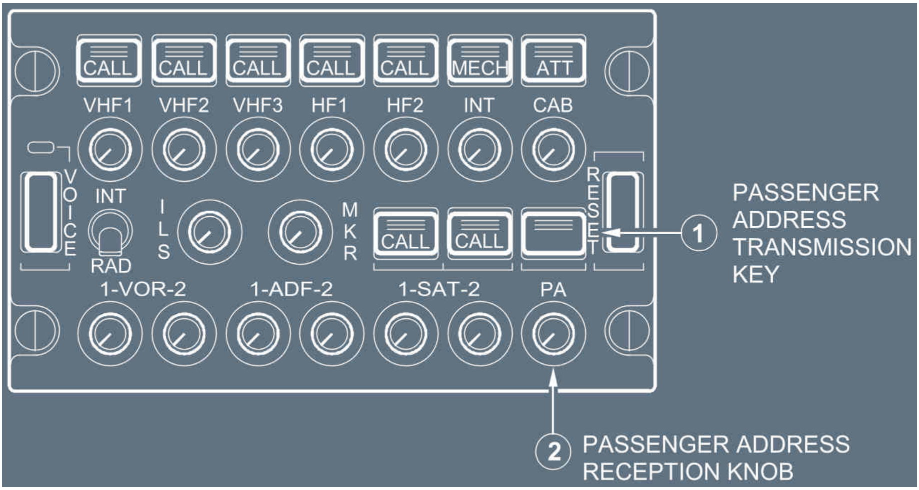
Pressed:	The COCKPIT CALL light goes out. The external horn stops sounding.

PASSENGER ADDRESS

Applicable to: ALL

Ident.: DSC-23-20-40-10-00000137.0002001 / 16 MAY 12

The passenger address system allows flight personnel to make passenger announcements in the cabin via the loudspeakers. It can be operated from the cockpit (with ACP, or handset), or from the cabin (attendant stations).


CALL
CALL
CALL
CALL
CALL
MECH
ATT
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
VOICE
INT
RAD
ILS
MKR
CALL
CALL
RESET
1-VOR-2
1-ADF-2
1-SAT-2
PA
1
PASSENGER ADDRESS TRANSMISSION KEY
2
PASSENGER ADDRESS RECEPTION KNOB

(1) PA Transmission Key

Pressed and held	:	The flight crew may use a boom, mask, or hand mike to make an announcement. Three green lines come on.

Note: *The flight crew may use a cockpit handset to make PA announcements without action on the ACPs.*

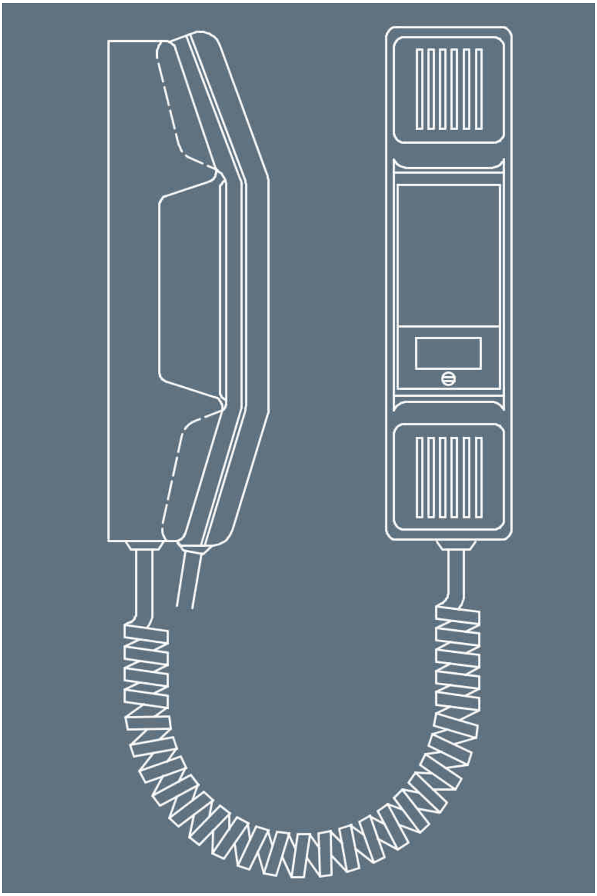
(2) PA Reception Knob

Pressed and released (knob out)	:	The message goes to the loudspeakers and the integral white light comes on. The flight crew can rotate the knob to adjust the volume.
Pressed (knob in)	:	The PA reception to the loudspeaker is disconnected. The white light goes out.

Ident.: DSC-23-20-40-10-00000147.0001001 / 21 MAR 17

COCKPIT HANDSET

The cockpit handset at the bottom of the pedestal is used for PA announcements.



Ident.: DSC-23-20-40-10-00000148.0001001 / 21 MAR 17

PA FROM COCKPIT

	PA TRANSMISSION KEY ON ACP	**PA RECEPTION KNOB ON ACP**	**PUSH TO TALK ON HANDMIKE**	**PUSH TO TALK ON HANDSET**
BOOMSET OR OXYGEN MASK	PRESSED (maintained)	OUT	-	-
HANDMIKE	PRESSED (maintained)	OUT	PRESSED	-
HANDSET	-	-	-	PRESSED

Intentionally left blank

DESCRIPTION

Ident.: DSC-23-30-10-00019802.0001001 / 17 MAR 17
Applicable to: ALL

Each transceiver can be tuned by any of the three Radio Management Panels (RMPs). The flight crew uses the Audio Control Panel (ACP) to select a VHF or HF system, and transmit. The ACP operates via the Audio Management Unit (AMU). Each system is connected to the RMPs, for frequency selection, and to the AMU for connection to the audio-integrating and SELCAL (selective calling) systems.

VHF

Ident.: DSC-23-30-10-00019145.0001001 / 17 MAR 17
Applicable to: ALL

The aircraft has three identical VHF communication systems. Each system has a transceiver in the avionics compartment, and an antenna on the fuselage. Only VHF1 operates in EMER ELEC CONFIG. The VHF1 range is from 118.0 to 136.975 MHz. The VHF has an alarm to indicate that the microphone ◁ is stuck. If a microphone is in the emission position for more than 30 s, an interrupted tone sounds for 5 s, and the emission is turned off. To reactivate the emission, the crew releases the push–to–talk button and presses it again.

Note: *The Rockwell Collins' In Flight Entertainment system (IFE) may cause an audible background noise on frequencies : 121.500, 135.000, and 135.005. In addition, the squelch may take a few seconds to close, once transmission on VHF3 frequency 135.005 is finished.*

HF

Ident.: DSC-23-30-10-00019146.0002001 / 05 JUL 17
Applicable to: ALL

The aircraft is equipped with High Frequency (HF) communication system:

- HF1
- HF2 ◁

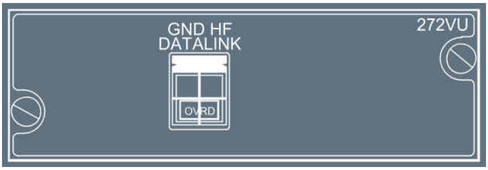
Each HF is composed of a transceiver installed in the avionics compartment, and a common tuner and antenna in the vertical stabilizer. The emission range is from 2.8 to 24.0 MHz.

Note:
- *Only HF1 is supplied in EMER ELEC CONFIG.*
- *HF is lost when LAND RECOVERY is selected ON.*

HF DATALINK ◁

When in data mode, digital information is transmitted between HF1 and ATSU. HF must not be used during refueling.

The HF DATA transmission is inhibited on ground. A GND HF DATALINK pb, located on the overhead panel, may override the inhibition.
The HF VOICE MODE is not inhibited on ground. The use of HF on ground must be limited to operational needs. It is important to check that nobody stays in the direct vicinity of the antennas if the HF is use on ground.



SELCAL (SELECTIVE CALLING)

Ident.: DSC-23-30-10-00019803.0001001 / 17 MAR 17
Applicable to: ALL

Upon receiving a call code corresponding to that of the aircraft, the SELCAL system aurally and visually advises the flight crew that a ground station is calling the aircraft. The aural signal is inhibited during takeoff and landing.

General

GENERAL

Ident.: DSC-23-30-20-10-00000340.0004001 / 26 JUN 15
Applicable to: ALL

The Satellite Communication (SATCOM) system allows the exchange of information between the aircraft and the ground network.
It provides both voice and data channels:
One or several channels are used for voice transmissions (cockpit or cabin voice). The cockpit voice function must be activated, in order for it to be available. The cabin telephone system must be installed, to be able to use cabin voice function.
One channel is used for data transmissions (ATSU or ACARS).
ACARS or ATSU communications normally transmit via VHF 3. They automatically switch to SATCOM when VHF 3 is not available.

The cockpit voice interface is controlled by the Audio Control Panels (ACPs) for call set-up and call termination, and by the MCDU for the call number selection. It allows the crew:
- To initiate air to ground calls and to receive ground to air calls
- To select the call priority, in case of air to ground calls
- To use manual dial or pre-recorded phone numbers.

SATCOM functions are programmed through the Owner Requirement Table (ORT), according to airline needs.
Due to the highly customized programming, the SATCOM functions may vary for different airlines and are, therefore, not described in detail.

Intentionally left blank

Controls and Indicators

ACP INTERFACE

Ident.: DSC-23-30-20-20-00000342.0001001 / 21 MAR 17
Applicable to: ALL

Refer to DSC-23-10-30 Audio Management System

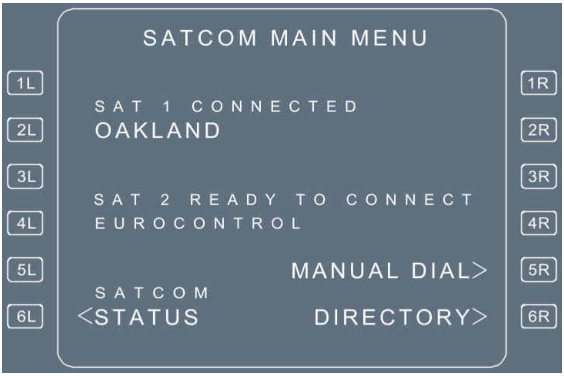
MCDU INTERFACE

Applicable to: ALL

Ident.: DSC-23-30-20-20-A-00000346.0004001 / 26 JUN 15

SATCOM MAIN MENU PAGE

The crew accesses this page by selecting SAT on the MCDU MAIN page.


SATCOM MAIN MENU
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SAT 1 CONNECTED
OAKLAND
SAT 2 READY TO CONNECT
EUROCONTROL
MANUAL DIAL>
SATCOM
<STATUS
DIRECTORY>

2L (4L) (Label line)

This field displays the SATCOM channel 1 (2) ◁ status:

- READY TO CONNECT : The channel is ready to support a call
- NOT AVAILABLE : The channel is not available (failed or not logged)
- DIALING : Cockpit call in progress
- INCOMING CALL : Advises of an incoming ground to air call
- CONNECTED : The circuit is connected
- CALL FAILED : The transmission is interrupted.

2L (4L) (Data line)

This field displays:

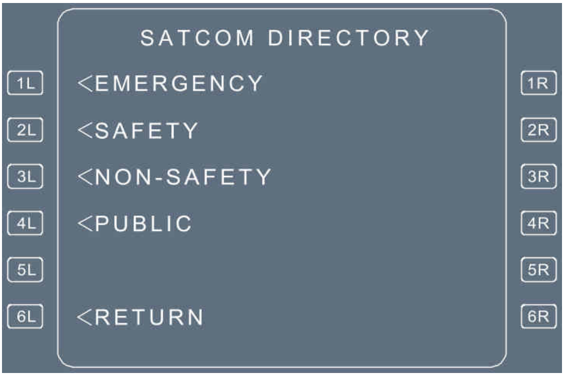
- The title of the selected phone number, in case of an air to ground call
- The number, if the MANUAL DIAL option is used
- GRND-AIR CALL, in case of a ground to air call.

5R	This key provides access to the Manual Dial page. This page allows the dialing of a phone number.
6L	This key provides access to the SATCOM STATUS page, which contains LOG ON and channel status information.
6R	This key provides access to the SATCOM DIRECTORY page.

Ident.: DSC-23-30-20-20-A-00000352.0002001 / 10 JAN 11

SATCOM DIRECTORY PAGE

This page provides access to 4 phone number lists, where phone numbers can be memorized, according to their priority.



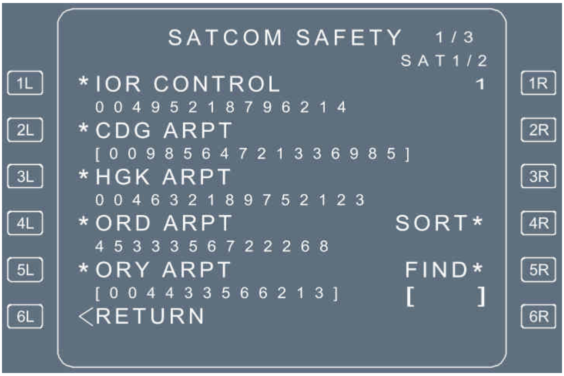
SATCOM DIRECTORY
<EMERGENCY
<SAFETY
<NON-SAFETY
<PUBLIC
<RETURN

1L : EMERGENCY for Priority 1 -	Reserved for emergency and distress phone numbers only.
2L : SAFETY for Priority 2 -	Reserved for regulatory and flight safety phone numbers only.
3L : NON-SAFETY for Priority 3 -	Reserved for non flight safety phone numbers.
4L : PUBLIC for Priority 4 -	Reserved for personal phone numbers.
6L :	This key is used to return to the SATCOM MAIN MENU page.

Ident.: DSC-23-30-20-20-A-00000356.0002001 / 10 JAN 11

SATCOM CATEGORY NUMBERS PAGE

The CATEGORY NUMBERS page provides access to the pre-recorded phone numbers.
As an example, the following figure shows the SAFETY CATEGORY NUMBER page.



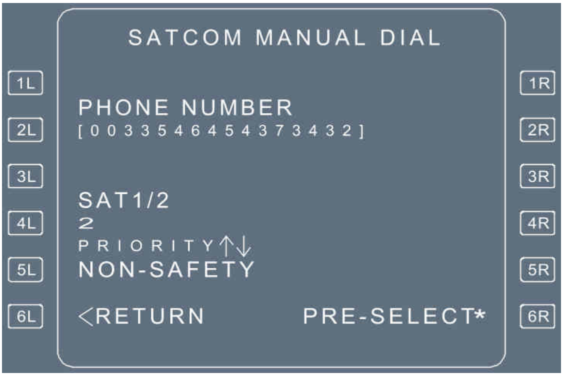
```
          SATCOM SAFETY   1/3
                       SAT1/2
*IOR CONTROL                 1
 00495218796214
*CDG ARPT
 [0098564721336985]
*HGK ARPT
 004632189752123
*ORD ARPT                SORT*
 4533356722268
*ORY ARPT                FIND*
 [004433566213]         [    ]
<RETURN
```

1L, 2L, 3L, 4L, 5L	These fields display the phone numbers and their titles. When pressed, they dial the corresponding phone number. There are two types of numbers: - Protected Displayed in green - Unprotected Displayed in blue brackets.
1R	This field displays the selected SATCOM channel.
4R	This function alphabetically sorts the phone numbers, within the category, by title.
5R	This function automatically searches for a phone number from the beginning of this category, by entering up to the first three letters of the title into the scratchpad, and by pressing 5R.
6L	This key is used to return to the SATCOM DIRECTORY page.

Ident.: DSC-23-30-20-20-A-00002685.0001001 / 26 JUN 15

SATCOM MANUAL DIAL PAGE

The MANUAL DIAL PAGE enables the crew to initiate an air to ground call by manually entering a phone number.


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

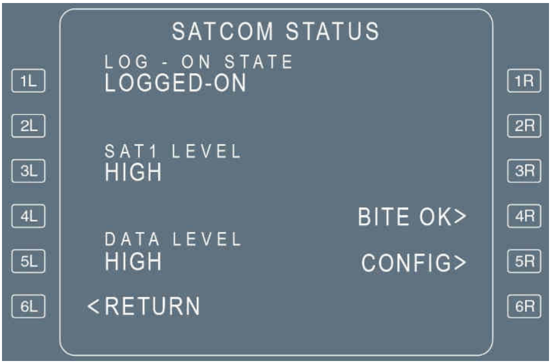
SATCOM MANUAL DIAL
PHONE NUMBER
[0033546454373432]
SAT1/2
2
PRIORITY↑↓
NON-SAFETY
<RETURN PRE-SELECT*

2L (data line)	This field displays the phone number in blue brackets, after having been entered in the scratchpad.
4L	If two channels are available, this field displays the selected SATCOM channel. If only one channel is available, this field is blank.
5L	This field displays the priority for the manual dial number. The priority can be changed by pressing the slew up or down keys on the MCDU keyboard.
6L	This key is used to return to the SATCOM MAIN MENU page.

Ident.: DSC-23-30-20-20-A-00021678.0001001 / 03 AUG 17

SATCOM STATUS PAGE

The crew accesses this page by selecting SATCOM STATUS on the SATCOM MAIN MENU page.


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

SATCOM STATUS
LOG - ON STATE
LOGGED-ON
SAT1 LEVEL
HIGH
BITE OK>
DATA LEVEL
HIGH
CONFIG>
<RETURN

1L Provides the current LOG-ON status:

- LOGGED-ON
- LOGGED-OFF
- SATCOM INOP.

3L (4L) (5L) (Data Line) Provides the signal level (HIGH or LOW) for:

- The voice channel 1 (SAT 1)
- The voice channel 2 (SAT 2) ◁
- The data link channel (DATA).

4R Displays the status of the SATCOM BITE:

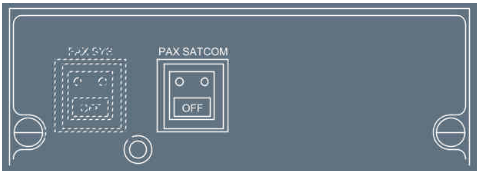
- BITE OK : The BITE status of all SATCOM items is OK
- BITE FAIL : At least the BITE status of one SATCOM items is failed. Gives access to the SATCOM BITE STATUS page.

5R Displays the SATCOM CONFIG page.

6L Displays the SATCOM MAIN MENU page.

OVERHEAD PANEL PAX

Ident.: DSC-23-30-20-20-00013155.0001001 / 16 MAR 11
Applicable to: LV-KAN, LV-KAO

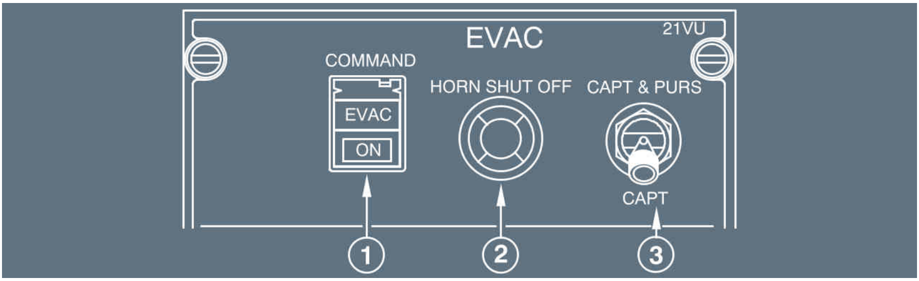


OFF : The PAX SATCOM system is in reset.

Intentionally left blank

GENERAL

Ident.: DSC-23-40-10-00000151.0001001 / 08 OCT 12
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU



(1) COMMAND pb (guarded)

ON : In the cockpit : EVAC light flashes red.
In the cabin :
- EVAC RESET light flash at all attendant panels.
- “EVACUATION ALERT” appears on all attendant indication panels and a red light flashes.
- Specific evacuation tone sounds.

Off : The alert is stopped.
The EVAC light flashes red when the alert is activated.

(2) HORN SHUT OFF pb
This button silences the cockpit horn (generated when evacuation is activated from the cabin).

(3) CAPT and PURS/CAPT sw

CAPT and PURS : The alert may either be activated from the cockpit or the cabin.

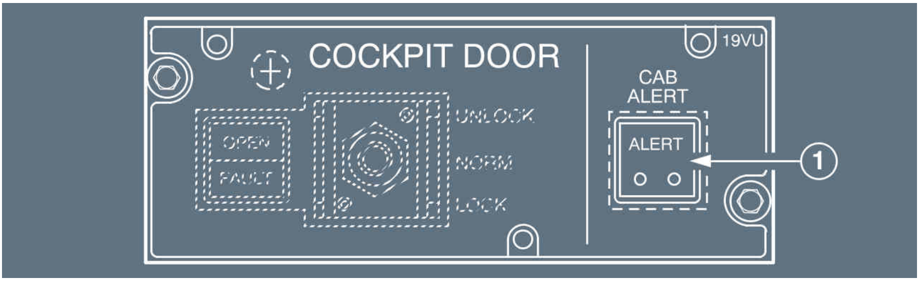
CAPT : The alert may only be activated from the cockpit.
If one of the cabin EVAC CMD keys is pressed, only the cockpit horn sounds for 3 s.

Intentionally left blank

CABIN TO COCKPIT ALERT

Ident.: DSC-23-40-20-00019798.0001001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

This function enables the cabin crew to rapidly and discretely alert pilots of any threat in the cabin, such as cockpit intrusion.
The cabin crew activates the alert by pressing one of the pushbuttons located in each attendant's area for a minimum of one second.
When the alert has been activated by the cabin crew, the buzzer sounds continuously in the cockpit, and the cockpit's center pedestal CAB ALERT pushbutton comes on.



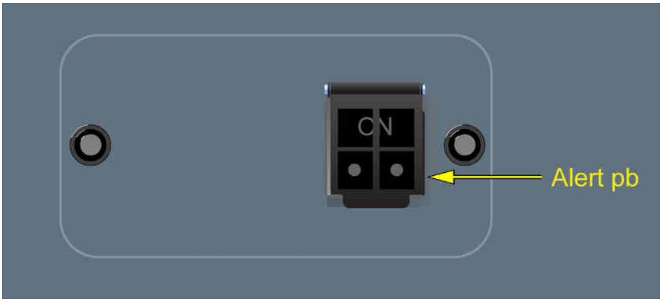
(1) CAB ALERT pushbutton

- ALERT light : This light comes on red, and a buzzer sounds in the cockpit, when an alert has been initiated from the cabin.
- Off : When the cockpit crew pushes the ALERT pushbutton, the buzzer stops and the red ALERT light goes off.

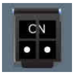
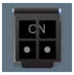
COCKPIT TO CABIN ALERT

Ident.: DSC-23-40-20-00019799.0003001 / 05 MAY 22
Applicable to: LV-GKO, LV-GKP

This function enables the flight crew to inform the cabin crew, via the CIDS network, of any threat in the cockpit. The flight crew activates this alert by pressing one of the two pushbuttons installed in the cockpit.
This also means that the hijacking code will be automatically transmitted to the ATC (*Refer to DSC-34-20-10-30 Remote ATC Box*).



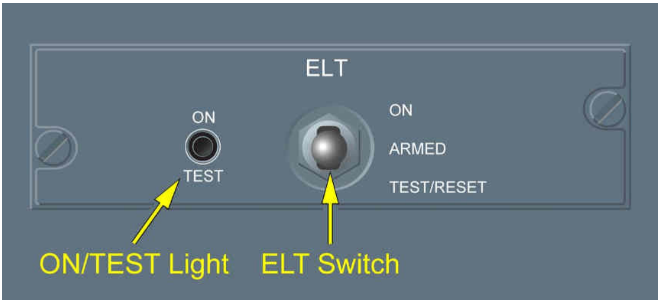
REMOTE ATC BOX PB

	The alert buzzer sounds in the cabin, and the alert lights come on, in each cabin crew station. The ON light only comes on when hijacking code is correctly transmitted to ATC (*Refer to DSC-34-20-10-30 Remote ATC Box*).
	The cockpit to cabin alert is not active.

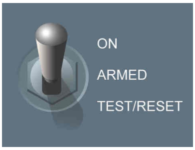
CONTROLS AND INDICATORS

Ident.: DSC-23-40-30-00019800.0003001 / 03 NOV 22
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

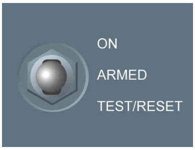
OVERHEAD PANEL


ELT
ON
TEST
ON
ARMED
TEST/RESET
ON/TEST Light
ELT Switch

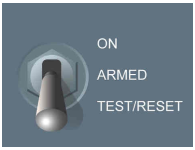
ELT SWITCH


ON
ARMED
TEST/RESET

The ELT transmits an emergency signal.


ON
ARMED
TEST/RESET

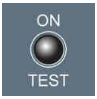
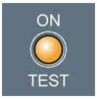
In the case of an impact, the ELT transmits an emergency signal.


ON
ARMED
TEST/RESET

An ELT autotest starts.

Note: *If the ELT is unduly triggered in ARMED mode (by an external impact, hard landing, etc), select the TEST/RESET position to reset the ELT and stop signal transmission.*

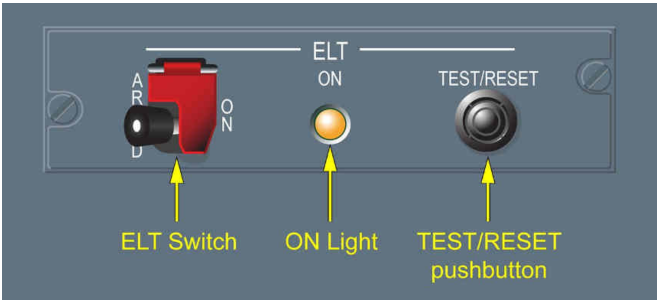
ON/TEST LIGHT

	The ELT is not transmitting.
	This light comes on, either when the emergency signal is transmitted or during the ELT test.

CONTROLS AND INDICATORS

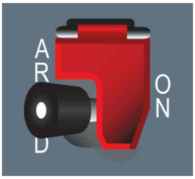
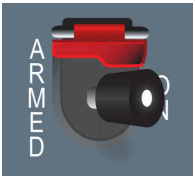
Ident.: DSC-23-40-30-00019800.0001001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

OVERHEAD PANEL

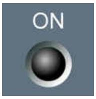


ELT SWITCH

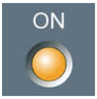
The guard keeps this switch in the ARMED position.

	In the case of an impact, the ELT transmits an emergency signal.
	The ELT transmits an emergency signal.

ON LIGHT

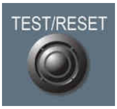


The ELT is not transmitting.



This light comes on, either when the emergency signal is transmitted or during the ELT test.

TEST/RESET PUSHBUTTON



When pressed, the ELT autotest starts.

Note: *If the ELT is unduly triggered in ARMED mode (by an external impact, hard landing, etc), push the TEST/RESET pb to reset the ELT and stop signal transmission.*

Intentionally left blank

ONBOARD MOBILE TELEPHONY SYSTEM ⩤

Ident.: DSC-23-47-00015737.0001001 / 05 JAN 15
Applicable to: ALL

GENERAL

The Onboard Mobile Telephony System (OMTS) enables passengers to use their mobile telephones for voice and data services during the cruise phase of flight.
OMTS uses satellite networks for interconnection with the ground. The system is controlled by the cabin crew via a control panel located in the cabin. A cockpit pushbutton is installed for the flight crew on the overhead panel (for description of PORTABLE EQPT & WIRELESS pb-sw, *Refer to DSC-25-20-50-20 PORTABLE EQPT & WIRELESS pb-sw (If Installed)*). This pushbutton-switch enables the flight crew to take control over the system.
The NO MOBILE signs located next to the FASTEN SEAT BELT signs indicate to the passengers when the use of mobile phones is allowed or prohibited.

The Onboard Mobile Telephony System is automatically inhibited:

- Below 3 000 m AGL (approximately 10 000 ft)
- In some geographical areas (refer to the "Regional Operation Data for the Onboard Mobile Telephony System" document for the identification of the geographical areas).

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CIDS

Ident.: DSC-23-49-00023417.0004001 / 03 NOV 23
Applicable to: ALL

CABIN READY ◁ : This memo indicates to the flight crew that the cabin is ready for take-off or for landing. This memo appears when the cabin crew presses the 'CABIN READY' key on the FAP.

Note: *The CABIN READY memo is displayed on the right side of the memos area or in the T/O and LDG memos checklist depending on the CIDS standard and customisation.*

CABIN...CHECK ◁ : This memo appears in the T/O and LDG memos checklist and indicates that the cabin is not ready for take-off or for landing ('CABIN READY' key not selected on the FAP).

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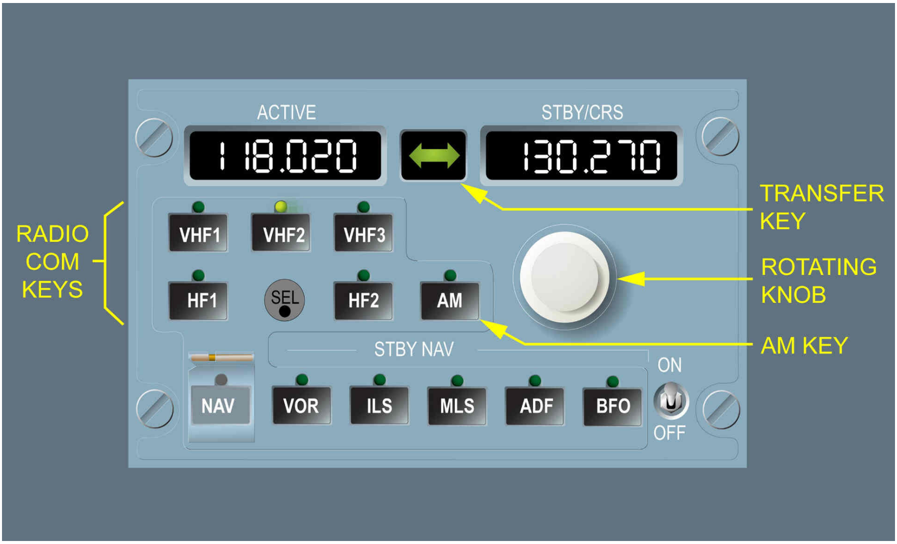
VHF, HF UTILIZATION

Applicable to: ALL

Ident.: DSC-23-50-A-00001899.0001001 / 05 MAR 18

TUNING

The pilot should normally use his onside RMP, to tune any one of the VHF or HF radios.
If a frequency is tuned on the RMP not dedicated to its associated VHF (e.g. VHF 1 tuned on RMP 2), the SEL lights come on (on the 3 RMP) to remind the pilot at least one radio system is not selected on its associated RMP. After each tuning, in order to be able to read VHF 1 and VHF 2 frequencies, the pilot should select the radio system associated with his RMP, this will extinguish the SEL lights.


ACTIVE
118.020
STBY/CRS
130.270
TRANSFER KEY
RADIO COM KEYS
VHF1
VHF2
VHF3
HF1
SEL
HF2
AM
ROTATING KNOB
AM KEY
STBY NAV
ON
NAV
VOR
ILS
MLS
ADF
BFO
OFF

ON/OFF switch...CHECK ON
VHF or HF key...PRESS

The green light comes on.
ACTIVE and STBY/CRS windows display active and preset frequencies, respectively.

HOW TO CHANGE THE FREQUENCY :

Rotating knob...TURN

Select the new frequency in the STBY/CRS window.
Outer knob is for units, inner knob for decimals.

Transfer key..PRESS

This interchanges the ACTIVE and STBY frequencies.
The receiver is now tuned to the new ACTIVE frequency.

AM key (if necessary)..PRESS

Green light comes on.

FAILURE CASES :

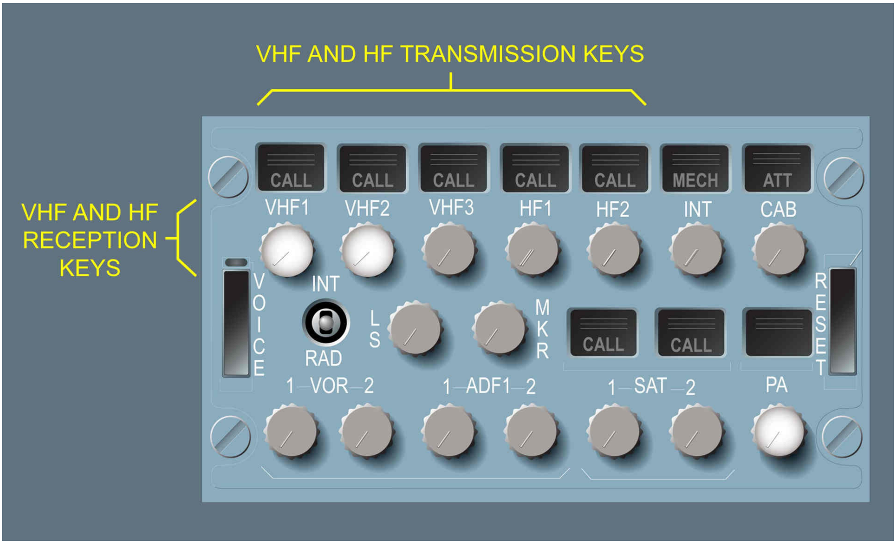
When an RMP fails :
- The affected RMP no longer controls the selected receiver.
- The frequency displays disappear, and the green VHF or HF lights go out.

Affected RMP.. SWITCH OFF

One RMP can control all receivers.

Ident.: DSC-23-50-A-00001900.0004001 / 05 MAR 18

TRANSMISSION AND RECEPTION


VHF AND HF TRANSMISSION KEYS
VHF AND HF RECEPTION KEYS
CALL
CALL
CALL
CALL
CALL
MECH
ATT
VHF1
VHF2
VHF3
HF1
HF2
INT
CAB
VOICE
INT
RAD
LS
MKR
CALL
CALL
RESET
1 VOR 2
1 ADF1 2
1 SAT 2
PA

VHF or HF reception key... PRESS

The integrated white light comes on.
The receiver brings in the selected system.
To adjust the volume, turn the key.

VHF or HF transmission key.. PRESS

Green bars on the selected system key light up.
Microphones and PTT command are connected to the selected system.

Note:
1. *Do not use VHF 3 for communication with the ATC, unless VHF 1 and VHF 2 are inoperative.*
2. *If two frequencies are closer than 2 MHz (between VHF 1 and 2, or between VHF 3 and 2), or closer than 6 MHz (between VHF 1 and 3), some interference may occur.*
3. *Reception of 130.275, 130.280 and 130.285 may be noisy (squelch open) on VHF 1 and/or VHF 3. In such cases, use VHF 2.*

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AIRCRAFT SYSTEMS

ELECTRICAL

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DSC-24-10 Description

DSC-24-10-10 General

General.....A

DSC-24-10-20 Generation of Electrical Power

DSC-24-10-20-10 AC Generation

Engine-Driven Generators.....A
APU Generator and External Power.....B
Emergency Generator.....C
Static Inverter.....D

DSC-24-10-20-20 DC Generation

Transformer Rectifiers (TR).....A
Batteries.....B

DSC-24-10-20-30 Contactors

General.....A
AC and DC Contactor Control.....B
No Break Power Transfer.....C
Monitoring and Indicating.....D

DSC-24-10-20-40 Circuit Breakers

Circuit Breakers.....A

DSC-24-10-30 Operations

DSC-24-10-30-10 General

General.....A

DSC-24-10-30-20 Normal Configuration

No Break Power Transfer (NBPT) Description.....A
In Flight.....B
On Ground.....C

DSC-24-10-30-30 Abnormal Configuration

Failure of One Engine Generator.....A
Failure of the AC BUS 1.....B
TR Failures.....C
Emergency Generation after Loss of All Main Generators.....D
Flight with Batteries Only.....E
On Ground, Batteries Only.....F

DSC-24-10-30-40 Distribution Table

Distribution Table.....A

Continued on the following page

Continued from the previous page

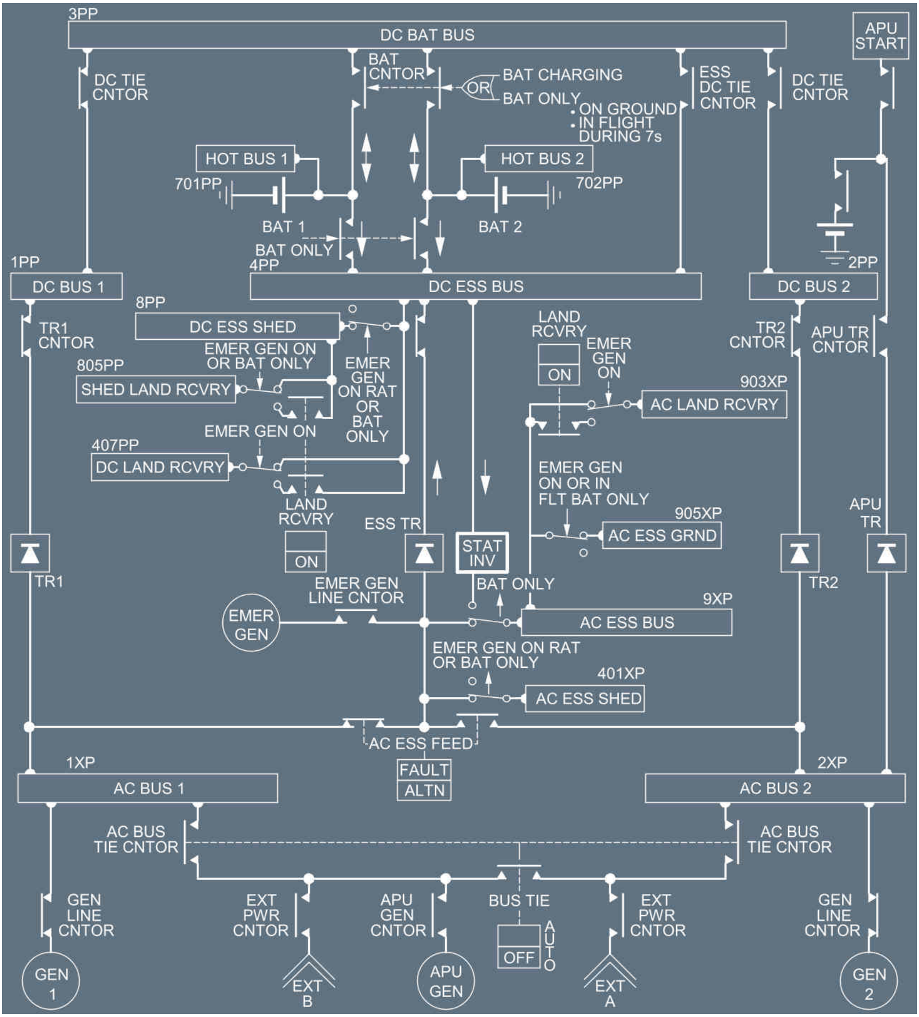
DSC-24-20 Controls and Indicators

Overhead Panel........A
ELEC EMER Panel........B
Forward Cabin........C
External Power Panel........D
ELEC AC ECAM Page........E
ELEC DC ECAM Page........F
C/B ECAM Page........G
C/B Pulled........H
Memo Display........I

GENERAL

Ident.: DSC-24-10-10-00017983.0001001 / 21 MAR 16
Applicable to: ALL

The electrical power system consists of a three phase 115/200 V 400 Hz constant-frequency AC system and a 28 V DC system. Electrical transients are acceptable for equipment. Commercial supply has secondary priority.
In normal configuration, the electrical power system provides AC power. The electrical power system is constituted of 2 engine generators and 1 APU generator. Each generator can provide AC power to all electrical bus bars. A part of this AC power is converted into DC power for certain applications.
In the event that normal AC power is not available, an emergency generator can provide AC power.
In the event that all AC power is not available, the electrical power system can invert DC power from the batteries into AC power.


3PP
DC BAT BUS
APU START
BAT CNTOR
DC TIE CNTOR
BAT CHARGING
OR
BAT ONLY
• ON GROUND
• IN FLIGHT DURING 7s
ESS DC TIE CNTOR
DC TIE CNTOR
HOT BUS 1
HOT BUS 2
701PP
702PP
BAT 1
BAT 2
BAT ONLY
1PP
4PP
2PP
DC BUS 1
DC ESS BUS
DC BUS 2
8PP
DC ESS SHED
TR1 CNTOR
EMER GEN ON OR BAT ONLY
805PP
SHED LAND RCVRY
EMER GEN ON RAT OR BAT ONLY
LAND RCVRY
ON
EMER GEN ON
903XP
AC LAND RCVRY
TR2 CNTOR
APU TR CNTOR
EMER GEN ON
407PP
DC LAND RCVRY
EMER GEN ON OR IN FLT BAT ONLY
LAND RCVRY
ON
ESS TR
905XP
AC ESS GRND
APU TR
STAT INV
TR1
TR2
BAT ONLY
EMER GEN LINE CNTOR
9XP
EMER GEN
AC ESS BUS
EMER GEN ON RAT OR BAT ONLY
401XP
AC ESS SHED
AC ESS FEED
FAULT
ALTN
1XP
AC BUS 1
2XP
AC BUS 2
AC BUS TIE CNTOR
AC BUS TIE CNTOR
GEN LINE CNTOR
EXT PWR CNTOR
APU GEN CNTOR
BUS TIE
EXT PWR CNTOR
GEN LINE CNTOR
OFF
AUTO
GEN 1
EXT B
APU GEN
EXT A
GEN 2

AC Generation

ENGINE-DRIVEN GENERATORS

Ident.: DSC-24-10-20-10-00004813.0004001 / 18 MAR 11
Applicable to: ALL

Two three-phase AC generators (GEN1, GEN2), driven by the engine through an integrated drive, supply aircraft electrical power. Each generator can supply up to 115 KVA of three phase 115/200 V 400 Hz power.

Two Generator Control Units (GCU) control the output of generator. The GCU:
- Controls the frequency and voltage of the generator output.
- Protects the network by controlling the associated generator line contactor (GLC).

APU GENERATOR AND EXTERNAL POWER

Ident.: DSC-24-10-20-10-00017991.0001001 / 21 MAR 16
Applicable to: ALL

An APU generator (APU GEN), driven directly by the APU and producing up to 115 KVA of three phase 115/200 V 400 Hz power, can replace one or more main engine generators at any time.
Two ground power connectors near the nosewheel allow ground power to be supplied to all busbars (with some galleys shed in case of overload). Two ground power units (90 KVA MAX each) can supply the aircraft.

A Ground Power Control Unit (GPCU):
- Protects the network by controlling the External Power Contactor
- Generates a reference frequency used by GCU for synchronisation before No Break Power Transfer (NBPT), or

A Ground and Auxiliary Power Control Unit (GAPCU) ◁ :
- Regulates, via the APU Electronic Control Box, the frequency and voltage of the APU generator when the No Break Power Transfer (NBPT) is required.
- Protects the network by controlling the external power contactor and the APU Generator Line Contactor.

EMERGENCY GENERATOR

Ident.: DSC-24-10-20-10-00000042.0002001 / 18 MAR 11
Applicable to: ALL

The green hydraulic circuit drives an emergency generator that automatically supplies emergency AC power to the aircraft electrical system, if all main generators fail. This generator supplies 8 KVA of three-phase 115/200 V 400 Hz power, except when the Ram Air Turbine powers the green hydraulic circuit, and the aircraft speed is below 260 kt; in this case, the emergency generator supplies 3.5 KVA, leading to some shedding.

A Generator Control Unit (GCU):
- Keeps the emergency generator at a constant speed
- Controls the generator's output voltage
- Protects the network by controlling the emergency generator line contactor
- Controls the emergency generator start-up.

When the emergency generator is automatically or manually coupled, the emergency generator continues to supply DC ESS and AC ESS buses, even if one or more main generators are recovered.

STATIC INVERTER

Ident.: DSC-24-10-20-10-00000044.0001001 / 21 MAR 16
Applicable to: ALL

A static inverter transforms DC power from the DC ESS bus into 2.5 KVA of single-phase 115 V 400 Hz AC power, which is then supplied to part of the AC essential bus. In flight, the inverter is automatically activated, if nothing but the batteries is supplying electrical power to the aircraft, regardless of the position of the BAT 1 and BAT 2 pushbuttons.
On ground, the inverter is activated, if only the batteries are supplying electrical power to the aircraft, and both BAT 1 and BAT 2 pushbuttons are on.

DC Generation

TRANSFORMER RECTIFIERS (TR)

Ident.: DSC-24-10-20-20-00000048.0001001 / 21 MAR 16
Applicable to: ALL

Two main Transformer Rectifiers TR1 and TR2 and one essential TR supply the aircraft's electrical system with DC current.
A fourth TR is dedicated to APU start or APU battery charging.
Each TR controls its contactor by internal logic.

BATTERIES

Ident.: DSC-24-10-20-20-00000050.0003001 / 21 MAR 16
Applicable to: ALL

Two main batteries, each with a normal capacity of 40 Ah, are permanently connected to the two hot busses.
An identical third battery (40 Ah) is dedicated to APU start.
Each battery has an associated Battery Charge Limiter (BCL).
The BCL monitors battery charging and controls its battery contactor.

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Contactors

GENERAL

Ident.: DSC-24-10-20-30-00017992.0001001 / 21 MAR 16
Applicable to: ALL

Two identical Electrical Contactor Management Units (ECMUs) provide:
- AC and DC contactors control (excepted TR contactors, which are controlled by the TR itself)
- Galley shedding control
- No Break Power Transfer control (NBPT)
- Monitoring and indicating.

For this purpose, each ECMU receives the following information:
- Voltage of all normal busbars
- Position of all AC and DC contactors
- Availability of all generators, or power source (from GCU, GPCU or GAPCU ◁*)
- Position of all galleys' contactors
- TR status
- Pushbutton position (BUS TIE, GALLEY SHED and COMMERCIAL)
- Flight/ground signal from associated LGCIU.

AC AND DC CONTACTOR CONTROL

Ident.: DSC-24-10-20-30-00000055.0002001 / 21 MAR 16
Applicable to: ALL

ECMU 1 controls :
- The Generator Line Contactor (GLC) 1.
- The AC Bus Tie Contactor (BTC) 1.
- The APU Generator Contactor.
- Both DC Tie Contactors.
- The BUS TIE Contactor
- The External Power Contactor B

ECMU 2 controls :
- The Generator Line Contactor (GLC) 2.
- The AC Bus Tie Contactor (BTC) 2.
- The External Power Contactor A.
- Both DC tie Contactors.

NO BREAK POWER TRANSFER

Ident.: DSC-24-10-20-30-00017994.0001001 / 21 MAR 16
Applicable to: ALL

This function avoids busbar power interruption during supply source transfer on ground in normal configuration. It is inhibited in flight.
The ECMU controls the simultaneous connection of the two sources for a short time. To achieve this, both sources are synchronized on a frequency reference signal sent by the GPCU or GAPCU ◁ .
Synchronization may take up to 15 s for the APU GEN with GPU, and some milliseconds in all other cases.
If synchronization is not achieved within the allowed time, transfer is performed anyway (without simultaneous connection of two sources). This function has a backup in the GCU.

MONITORING AND INDICATING

Ident.: DSC-24-10-20-30-00000066.0001001 / 21 MAR 16
Applicable to: ALL

Each ECMU sends the following information to the ECAM:
- Busbars supplied or not
- Contactor status
- Galley supply status, and galley switch position.

Circuit Breakers

CIRCUIT BREAKERS

Ident.: DSC-24-10-20-40-00000069.0001001 / 21 MAR 16
Applicable to: ALL

All circuit breakers are in the electronic equipment bay.
A Circuit Breaker Monitoring Unit (CBMU) monitors the circuit breaker status. It sends this information to the ECAM system.

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General

GENERAL

Ident.: DSC-24-10-30-10-00000073.0002001 / 22 MAR 16

Applicable to: ALL

Each AC BUS is supplied in priority order by :

- the corresponding engine generator.
- the APU generator or the external power A (if both are connected, the APU generator has priority for the left side bars, and the external power has priority for the right side bars).
- the external power B (if both external powers are connected, B has priority for the left side bars and A has priority for the right side bars).
- the other side engine generator.

The APU generator or an external power may supply all the network.
One generators can supply all the network (with galley shedding in case of overload detection).
The generators cannot be connected in parallel (except on ground during No Break Power Transfers).

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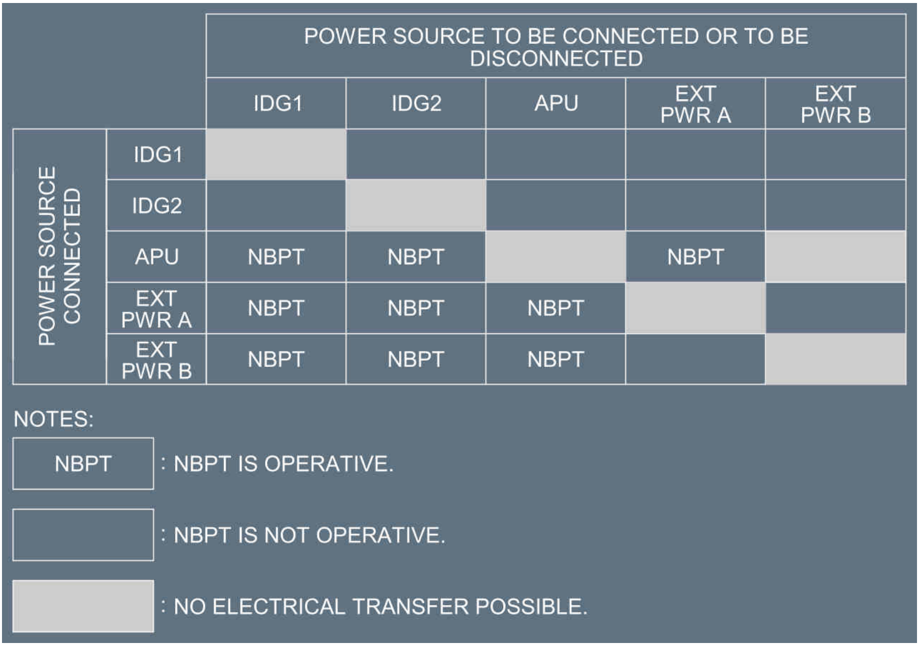
Normal Configuration

NO BREAK POWER TRANSFER (NBPT) DESCRIPTION

Ident.: DSC-24-10-30-20-00012806.0001001 / 09 OCT 12
Applicable to: ALL

As per design, the NBPT function is effective provided that the power supply sources connections/disconnections are done according to the below table.
If the flight crew does not follow the sequences provided in this table, power transfers without NBPT can be observed.



		POWER SOURCE TO BE CONNECTED OR TO BE DISCONNECTED				
		IDG1	IDG2	APU	EXT PWR A	EXT PWR B
POWER SOURCE CONNECTED	IDG1	▨				
	IDG2		▨			
	APU	NBPT	NBPT	▨	NBPT	▨
	EXT PWR A	NBPT	NBPT	NBPT	▨	
	EXT PWR B	NBPT	NBPT	NBPT		▨

NOTES:

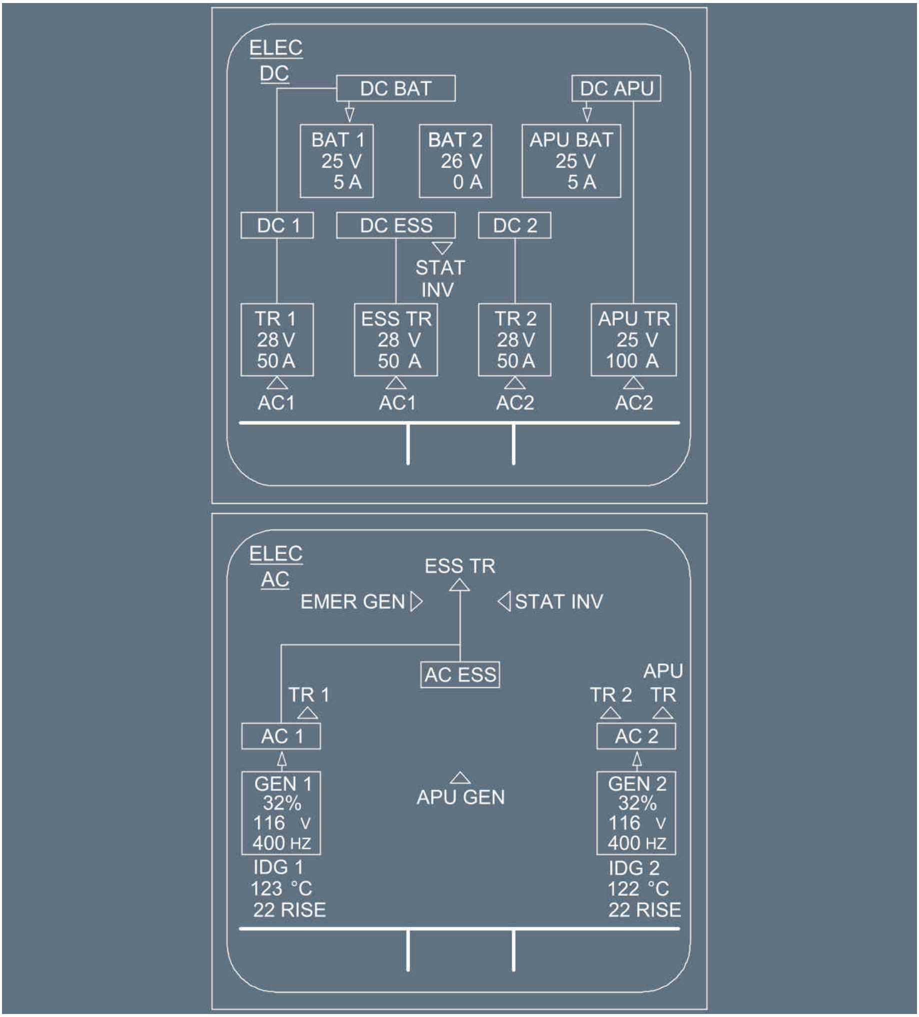
NBPT	: NBPT IS OPERATIVE.
☐	: NBPT IS NOT OPERATIVE.
▨	: NO ELECTRICAL TRANSFER POSSIBLE.

IN FLIGHT

Ident.: DSC-24-10-30-20-00000074.0002001 / 09 OCT 12
Applicable to: ALL

Each engine driven generator supplies its associated AC BUS (1 and 2) via its Generator Line Contactor (GLC 1 and GLC 2).
AC BUS 1 normally supplies the AC ESS BUS via a contactor.
AC BUS 1 supplies TR 1 which normally supplies DC BUS 1, DC BAT BUS.

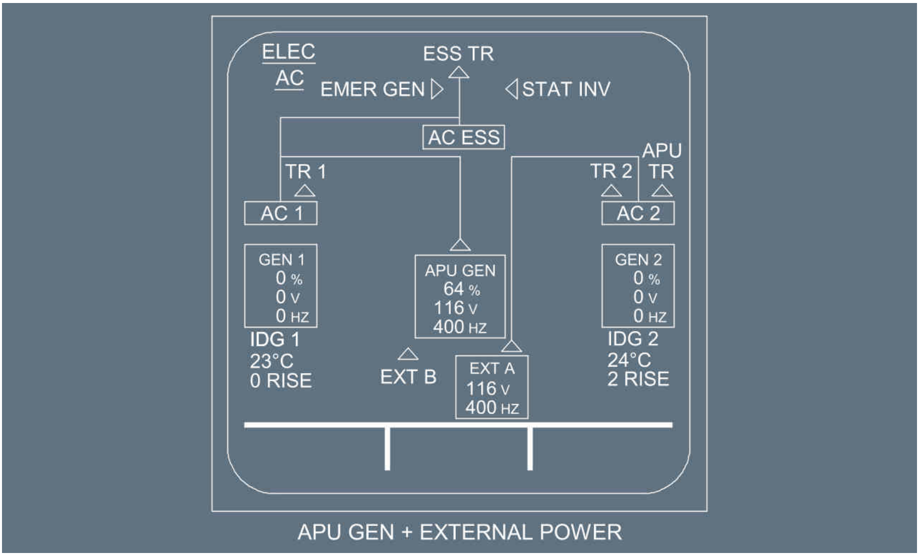
AC BUS 2 supplies TR 2 which normally supplies DC BUS 2.
AC BUS 1 supplies ESS TR which normally supplies DC ESS BUS.
The two batteries are connected to the DC BAT BUS if they need charging. When they are fully charged the Battery Charge Limiter disconnects them.


ELEC
DC
DC BAT
DC APU
BAT 1
25 V
5 A
BAT 2
26 V
0 A
APU BAT
25 V
5 A
DC 1
DC ESS
DC 2
STAT
INV
TR 1
28 V
50 A
ESS TR
28 V
50 A
TR 2
28 V
50 A
APU TR
25 V
100 A
AC1
AC1
AC2
AC2
ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU
TR 1
TR 2
TR
AC 1
AC 2
GEN 1
32%
116 V
400 HZ
APU GEN
GEN 2
32%
116 V
400 HZ
IDG 1
123 °C
22 RISE
IDG 2
122 °C
22 RISE

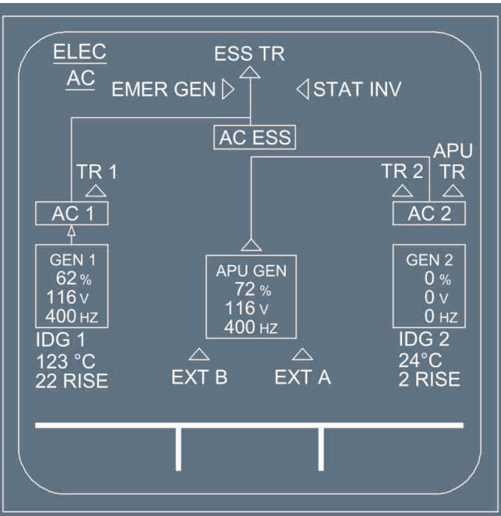
ON GROUND

Ident.: DSC-24-10-30-20-00000076.0002001 / 09 OCT 12
Applicable to: ALL

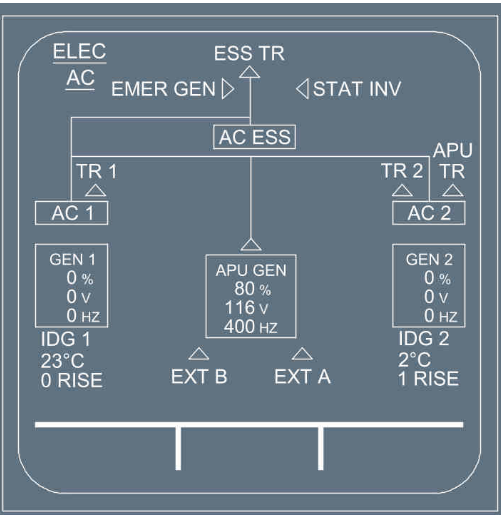
Either the APU generator or external power may supply the complete system (with some galley shedding in case of overload).


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
TR 1
APU
TR 2
TR
AC 1
AC 2
GEN 1
0 %
0 V
0 HZ
APU GEN
64 %
116 V
400 HZ
GEN 2
0 %
0 V
0 HZ
IDG 1
23°C
0 RISE
EXT B
EXT A
116 V
400 HZ
IDG 2
24°C
2 RISE

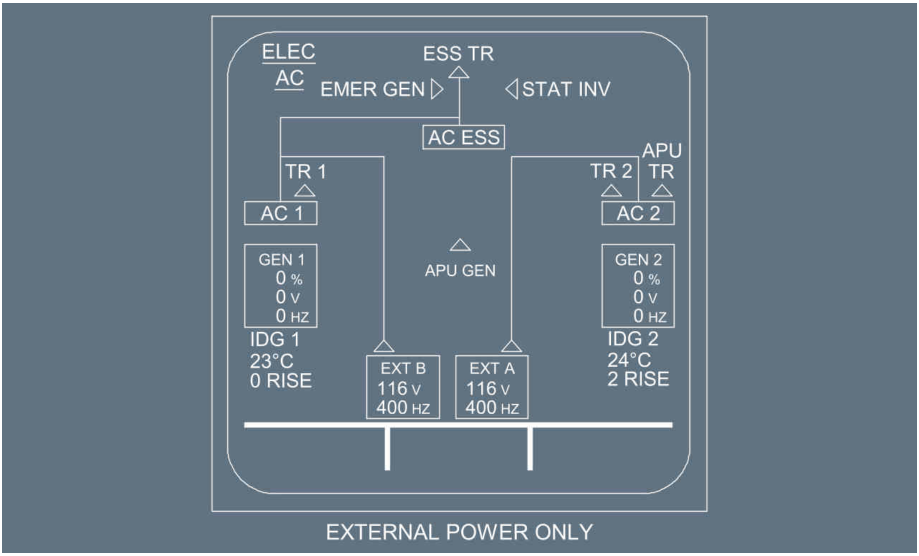
APU GEN + EXTERNAL POWER


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU
TR 1
TR 2
TR
AC 1
AC 2
GEN 1
62 %
116 V
400 HZ
APU GEN
72 %
116 V
400 HZ
GEN 2
0 %
0 V
0 HZ
IDG 1
123 °C
22 RISE
EXT B
EXT A
IDG 2
24°C
2 RISE

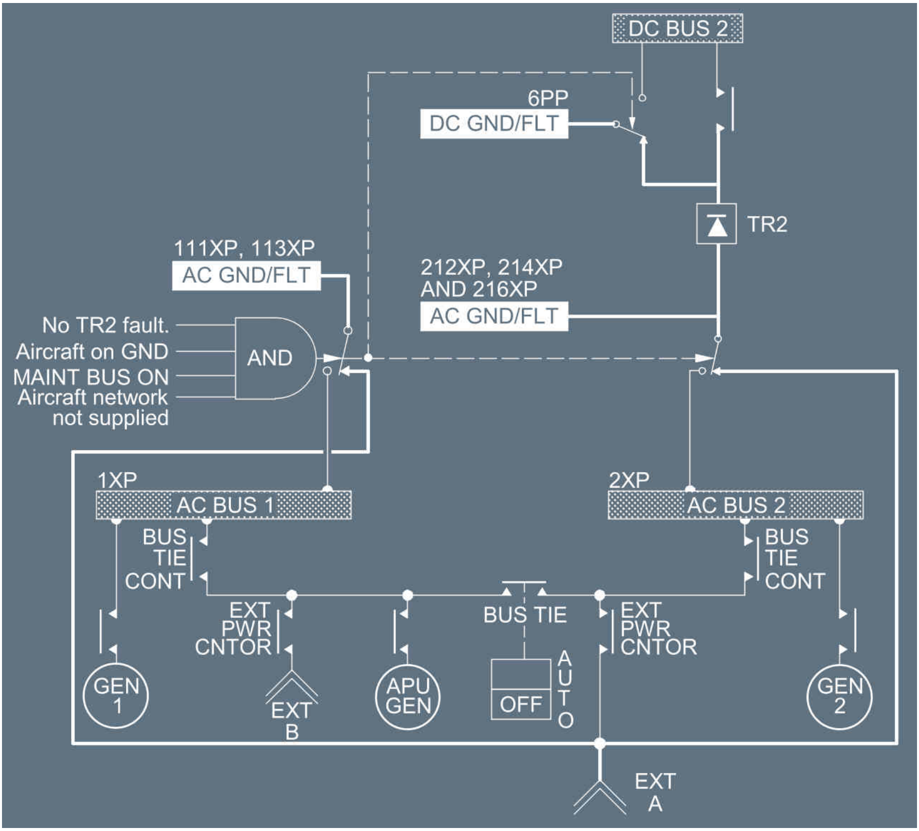
APU GEN + GEN 1


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU
TR 1
TR 2
TR
AC 1
AC 2
GEN 1
0 %
0 V
0 HZ
APU GEN
80 %
116 V
400 HZ
GEN 2
0 %
0 V
0 HZ
IDG 1
23°C
0 RISE
EXT B
EXT A
IDG 2
2°C
1 RISE

APU GEN ONLY


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
TR 1
APU
TR 2
TR
AC 1
AC 2
GEN 1
0 %
0 V
0 HZ
APU GEN
GEN 2
0 %
0 V
0 HZ
IDG 1
23°C
0 RISE
EXT B
116 V
400 HZ
EXT A
116 V
400 HZ
IDG 2
24°C
2 RISE
EXTERNAL POWER ONLY

If external power A, external power B and the APU generator supply the entire system, the APU generator has priority over external power B.
The display is then the same as the one for APU generator plus external power.
On ground, when only ground services are required, external power can supply the AC and DC GND/FLT buses directly, without supplying the aircraft's entire network.
This configuration is selected via the MAINT BUS switch, located in the forward entrance area.


DC BUS 2
6PP
DC GND/FLT
TR2
111XP, 113XP
AC GND/FLT
212XP, 214XP
AND 216XP
AC GND/FLT
No TR2 fault.
Aircraft on GND
MAINT BUS ON
Aircraft network
not supplied
AND
1XP
AC BUS 1
2XP
AC BUS 2
BUS
TIE
CONT
BUS
TIE
CONT
EXT
PWR
CNTOR
BUS TIE
EXT
PWR
CNTOR
GEN
1
EXT
B
APU
GEN
OFF
AUTO
GEN
2
EXT
A

Abnormal Configuration

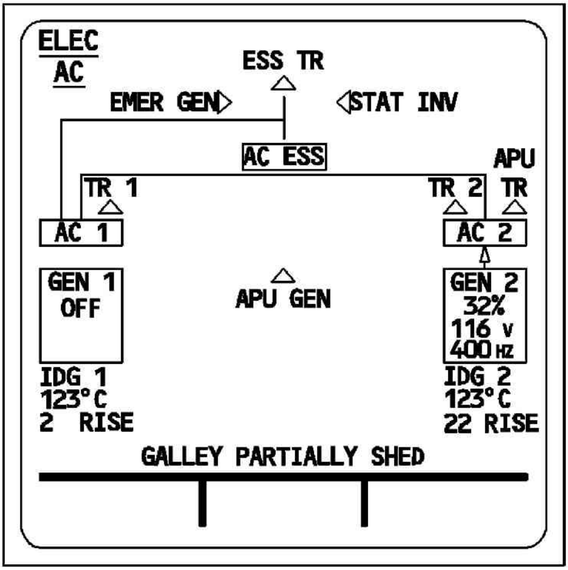
FAILURE OF ONE ENGINE GENERATOR

Ident.: DSC-24-10-30-30-00004811.0001001 / 28 AUG 15
Applicable to: ALL

ECMU provides automatic reconfiguration.
Complete network remains supplied.

Note: *If a generator is lost due to overcurrent detection, reconfiguration does not occur and the related AC BUS is lost.*

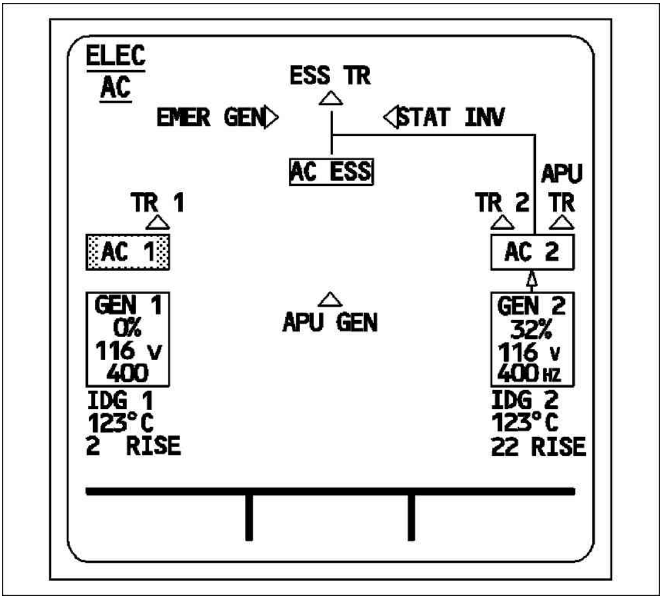
The system automatically replaces the failed generator with :
- The APU generator if available or,
- The other engine generator (automatically shedding part of the galley load and some commercial loads).


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU
TR 1
TR 2
TR
AC 1
AC 2
GEN 1
OFF
APU GEN
GEN 2
32%
116 V
400 HZ
IDG 1
123°C
2 RISE
IDG 2
123°C
22 RISE
GALLEY PARTIALLY SHED

FAILURE OF THE AC BUS 1

Ident.: DSC-24-10-30-30-00009199.0001001 / 14 FEB 11
Applicable to: ALL

The AC BUS 2 supplies the AC ESS BUS and the ESS TR automatically.


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU TR
TR 1
TR 2
AC 1
AC 2
GEN 1
0%
116 V
400
APU GEN
GEN 2
32%
116 V
400 HZ
IDG 1
123°C
2 RISE
IDG 2
123°C
22 RISE

TR FAILURES

Ident.: DSC-24-10-30-30-00000097.0002001 / 14 FEB 11
Applicable to: ALL

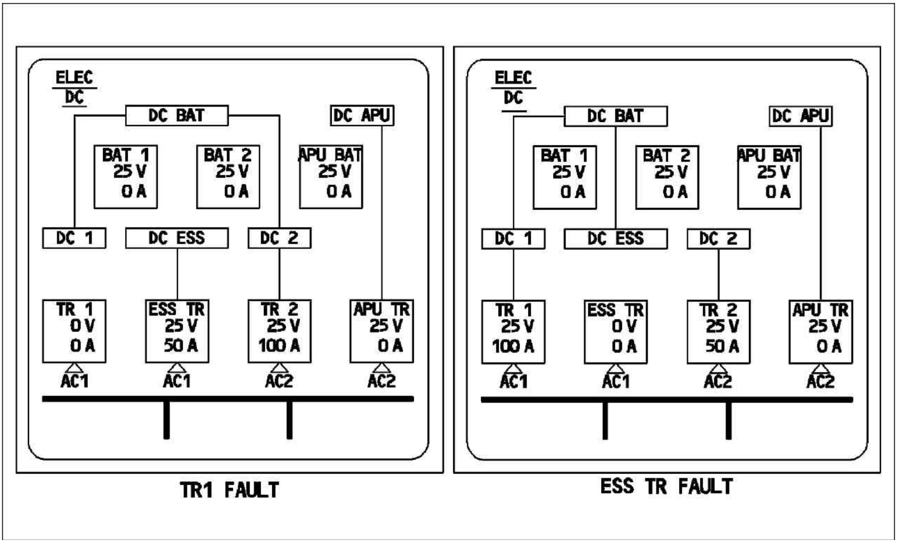
The contactor of each TR automatically opens, in case of :
- Overheat
- Minimum current
- Overcurrent
- Open or short circuit.

The ECMU provides automatic reconfiguration (except for APU TR).

Note: *If a TR is lost due to overcurrent detection, reconfiguration does not occur and the related DC BUS is lost.*

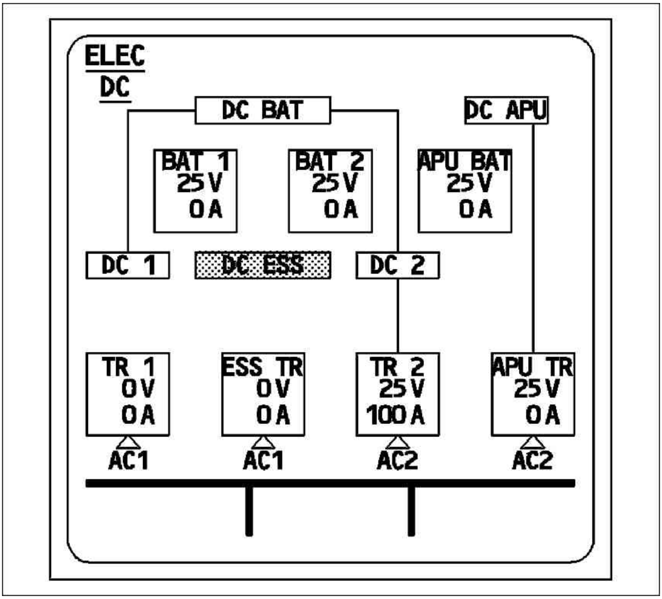
FAILURE OF ONE TR

- TR 1 or 2 lost : The available TR replaces the faulty one.
- ESS TR lost : TR 1 replaces the ESS TR.


ELEC
DC
DC BAT
DC APU
BAT 1
25 V
0 A
BAT 2
25 V
0 A
APU BAT
25 V
0 A
DC 1
DC ESS
DC 2
TR 1
0 V
0 A
ESS TR
25 V
50 A
TR 2
25 V
100 A
APU TR
25 V
0 A
AC1
AC1
AC2
AC2
TR1 FAULT
ELEC
DC
DC BAT
DC APU
BAT 1
25 V
0 A
BAT 2
25 V
0 A
APU BAT
25 V
0 A
DC 1
DC ESS
DC 2
TR 1
25 V
100 A
ESS TR
0 V
0 A
TR 2
25 V
50 A
APU TR
25 V
0 A
AC1
AC1
AC2
AC2
ESS TR FAULT

FAILURE OF ESS TR AND TR 1 (OR TR 2)

The remaining TR supplies the two DC norm busses and the DC BAT bus.
The DC ESS bus is lost.


ELEC
DC
DC BAT
DC APU
BAT 1
25 V
0 A
BAT 2
25 V
0 A
APU BAT
25 V
0 A
DC 1
DC ESS
DC 2
TR 1
0 V
0 A
ESS TR
0 V
0 A
TR 2
25 V
100 A
APU TR
25 V
0 A
AC1
AC1
AC2
AC2

EMERGENCY GENERATION AFTER LOSS OF ALL MAIN GENERATORS

Ident.: DSC-24-10-30-30-00017995.0001001 / 21 MAR 16
Applicable to: ALL

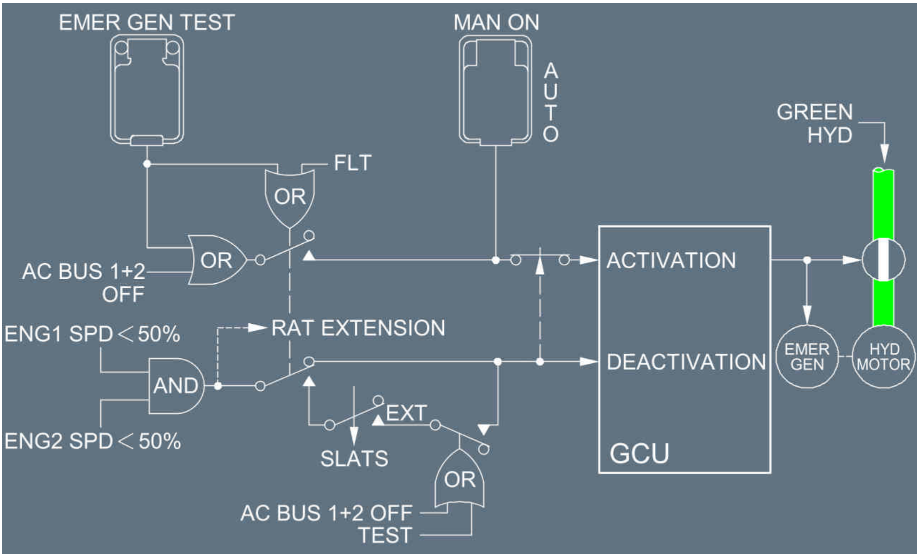
- **In case of main generators loss:**
  The emergency generator automatically supplies AC power to the aircraft electrical system.

  The green hydraulic pressure, which powers the emergency generator, is provided by:
  - Engine(s) driven pump(s), if at least one engine is running, or
  - The Ram Air Turbine (RAT), if both engines are lost. In this failure case, the RAT automatically extends.
- **If powered by the RAT only:**
  The EMER GEN is inhibited when slats are extended.

The flight crew can also manually activate the emergency generator by pushing the MAN ON pb.

Emergency generator deactivation occurs only automatically :
- In flight : At slats extension ; if powered by the RAT only (both engines are lost) it can be reactivated after slats retraction via the MAN ON pushbutton.
- On the ground : after both engines shutdown.

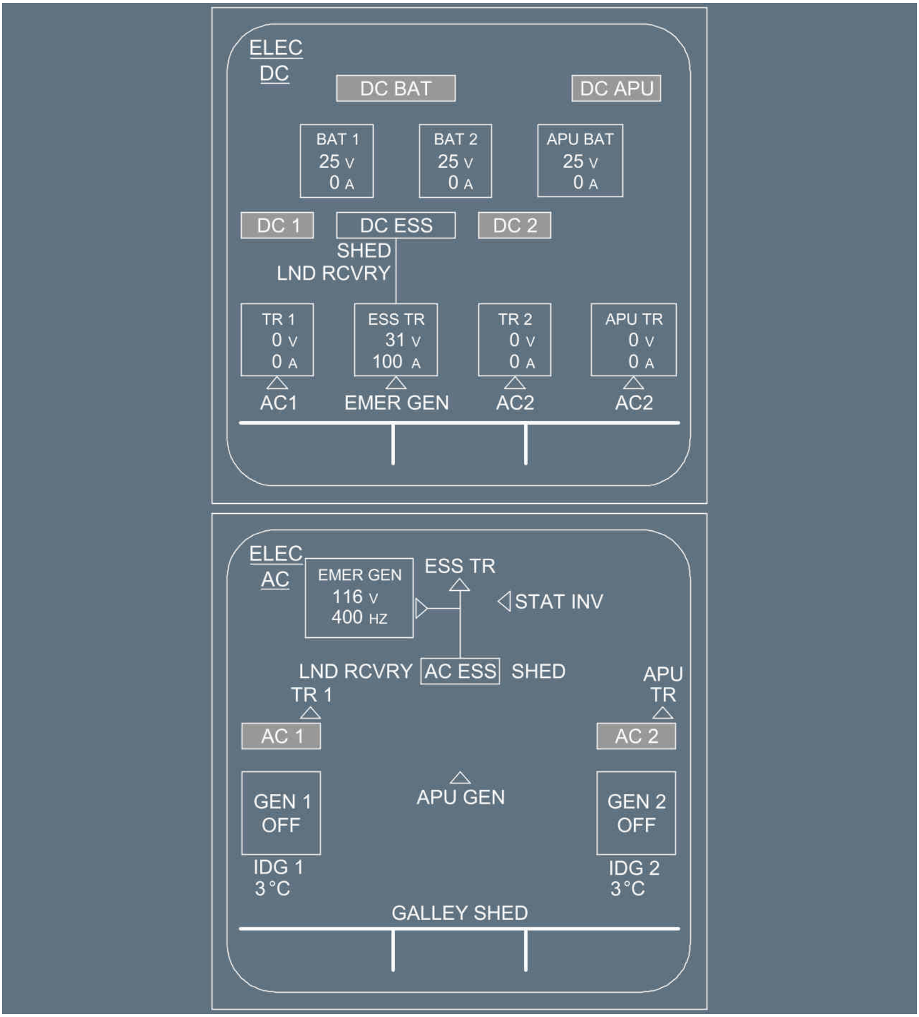
The EMER GEN TEST pushbutton allows to activate the emergency generator and to connect it to the essential network. This test is inhibited when the slats are extended.


EMER GEN TEST
MAN ON
AUTO
GREEN HYD
FLT
OR
OR
AC BUS 1+2 OFF
ACTIVATION
ENG1 SPD < 50%
RAT EXTENSION
AND
DEACTIVATION
EMER GEN
HYD MOTOR
EXT
ENG2 SPD < 50%
SLATS
OR
GCU
AC BUS 1+2 OFF
TEST

- If the green hydraulic system, which actuates the emergency generator, is powered by an engine-driven pump, the emergency generator supplies the :
  - AC ESS BUS,
  - AC ESS SHED.

  And, through the ESS TR, the :
  - DC ESS BUS,
  - DC ESS SHED.
- If the green hydraulic system is powered by the Ram Air Turbine, the emergency generator supplies the :
  - AC ESS BUS,
  - DC ESS BUS, through the ESS TR.

All LAND RECOVERY AC and DC BUS bars are shed. They are recovered when the LAND RECOVERY pushbutton is ON.
The AC ESS GND is lost.


ELEC
DC
DC BAT
DC APU
BAT 1
25 V
0 A
BAT 2
25 V
0 A
APU BAT
25 V
0 A
DC 1
DC ESS
DC 2
SHED
LND RCVRY
TR 1
0 V
0 A
ESS TR
31 V
100 A
TR 2
0 V
0 A
APU TR
0 V
0 A
AC1
EMER GEN
AC2
AC2
ELEC
AC
EMER GEN
116 V
400 HZ
ESS TR
STAT INV
LND RCVRY
AC ESS
SHED
APU
TR
TR 1
AC 1
AC 2
APU GEN
GEN 1
OFF
GEN 2
OFF
IDG 1
3 °C
IDG 2
3 °C
GALLEY SHED

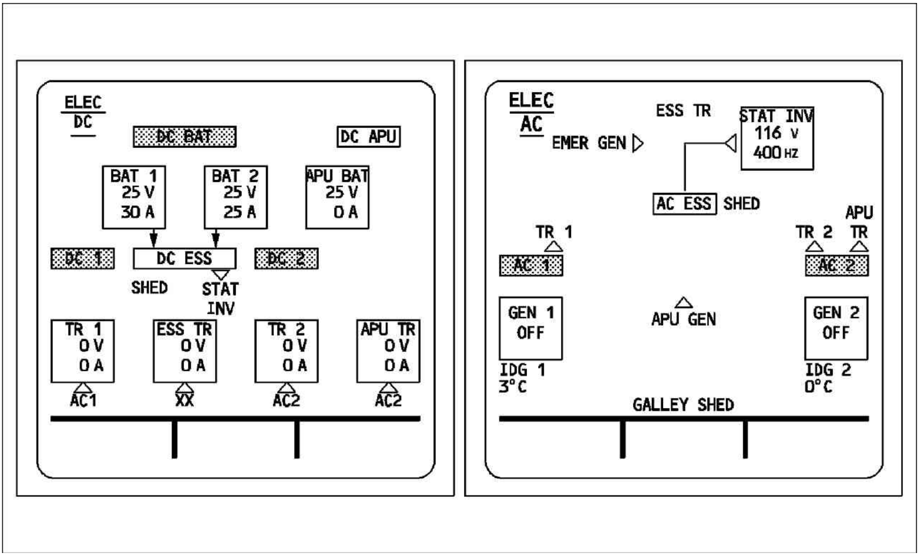
FLIGHT WITH BATTERIES ONLY

Ident.: DSC-24-10-30-30-00004812.0003001 / 14 FEB 11
Applicable to: ALL

When emergency generator is not available, the batteries supply :
- the DC ESS BUS
- the DC LAND RECOVERY (whatever the LAND RECOVERY pushbutton position is)

and through the STAT INV :
- the AC ESS BUS
- the AC LAND RECOVERY (whatever the LAND RECOVERY pushbutton position is)

The AC ESS SHED, the DC ESS SHED and the SHED LAND RECOVERY are not supplied.
The AC ESS GND is lost.
Example : flight with batteries only.


ELEC
DC
DC BAT
DC APU
BAT 1
25 V
30 A
BAT 2
25 V
25 A
APU BAT
25 V
0 A
DC 1
DC ESS
DC 2
SHED
STAT
INV
TR 1
0 V
0 A
ESS TR
0 V
0 A
TR 2
0 V
0 A
APU TR
0 V
0 A
AC1
XX
AC2
AC2
ELEC
AC
EMER GEN
ESS TR
STAT INV
116 V
400 HZ
AC ESS
SHED
TR 1
TR 2
APU
TR
AC 1
AC 2
GEN 1
OFF
APU GEN
GEN 2
OFF
IDG 1
3°C
IDG 2
0°C
GALLEY SHED

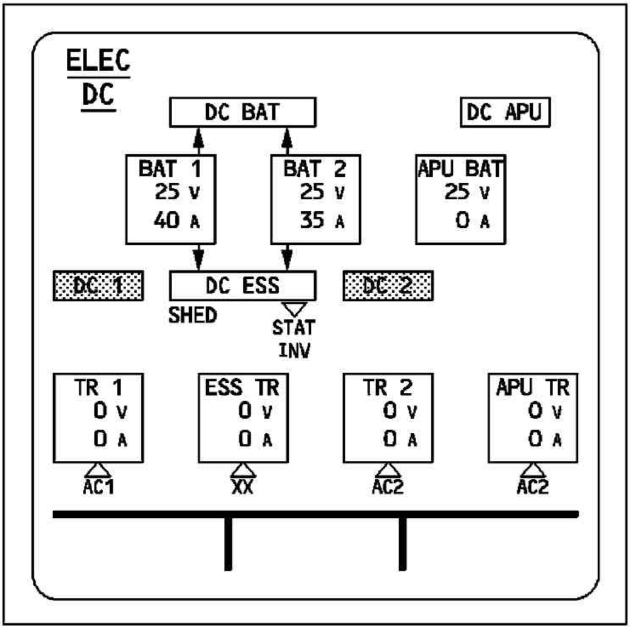
ON GROUND, BATTERIES ONLY

Ident.: DSC-24-10-30-30-00018017.0001001 / 21 MAR 16
Applicable to: ALL

Provided they are both selected AUTO, batteries supply the :
- DC ESS BUS
- DC BAT BUS
- DC LAND RECOVERY (whatever the position of the LAND RECOVERY pushbutton)

And, through the static inverter, the :
- AC ESS BUS, and
- AC ESS GND
- AC LAND RECOVERY (whatever the LAND RECOVERY pushbutton position is)

The AC ESS SHED, the DC ESS SHED and the SHED LAND RECOVERY are not supplied.


ELEC
DC
DC BAT
DC APU
BAT 1
25 V
40 A
BAT 2
25 V
35 A
APU BAT
25 V
0 A
DC 1
DC ESS
DC 2
SHED
STAT
INV
TR 1
0 V
0 A
ESS TR
0 V
0 A
TR 2
0 V
0 A
APU TR
0 V
0 A
AC1
XX
AC2
AC2

Note: ELEC AC ECAM page is identical to the one for flight with batteries only.

Battery Discharge Warning ◁

On ground, an external horn is activated, if the following conditions are met :

- External power contactor OFF (ground power unit disconnected, or EXT PWR pushbutton at OFF ;
- Generators not running ;
- BAT pushbutton switched at auto, and batteries connected to the aircraft network.
  If the batteries are not switched off, the horn automatically stops after 5 min.

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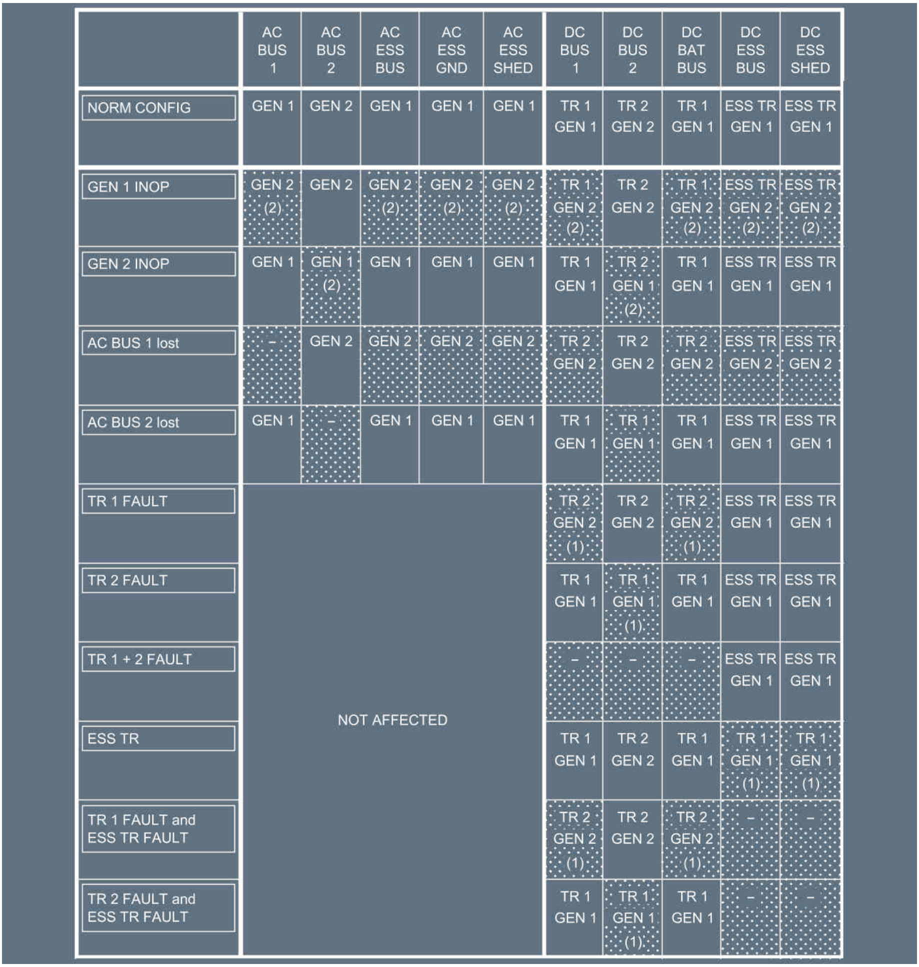
Distribution Table

DISTRIBUTION TABLE

Ident.: DSC-24-10-30-40-00018020.0001001 / 10 MAY 21
Applicable to: ALL

Shaded cells indicate backup supply.



	AC BUS 1	AC BUS 2	AC ESS BUS	AC ESS GND	AC ESS SHED	DC BUS 1	DC BUS 2	DC BAT BUS	DC ESS BUS	DC ESS SHED
NORM CONFIG	GEN 1	GEN 2	GEN 1	GEN 1	GEN 1	TR 1 GEN 1	TR 2 GEN 2	TR 1 GEN 1	ESS TR GEN 1	ESS TR GEN 1
GEN 1 INOP	GEN 2 (2)	GEN 2	GEN 2 (2)	GEN 2 (2)	GEN 2 (2)	TR 1 GEN 2 (2)	TR 2 GEN 2	TR 1 GEN 2 (2)	ESS TR GEN 2 (2)	ESS TR GEN 2 (2)
GEN 2 INOP	GEN 1	GEN 1 (2)	GEN 1	GEN 1	GEN 1	TR 1 GEN 1	TR 2 GEN 1 (2)	TR 1 GEN 1	ESS TR GEN 1	ESS TR GEN 1
AC BUS 1 lost	–	GEN 2	GEN 2	GEN 2	GEN 2	TR 2 GEN 2	TR 2 GEN 2	TR 2 GEN 2	ESS TR GEN 2	ESS TR GEN 2
AC BUS 2 lost	GEN 1	–	GEN 1	GEN 1	GEN 1	TR 1 GEN 1	TR 1 GEN 1	TR 1 GEN 1	ESS TR GEN 1	ESS TR GEN 1
TR 1 FAULT	NOT AFFECTED					TR 2 GEN 2 (1)	TR 2 GEN 2	TR 2 GEN 2 (1)	ESS TR GEN 1	ESS TR GEN 1
TR 2 FAULT						TR 1 GEN 1	TR 1 GEN 1 (1)	TR 1 GEN 1	ESS TR GEN 1	ESS TR GEN 1
TR 1 + 2 FAULT						–	–	–	ESS TR GEN 1	ESS TR GEN 1
ESS TR						TR 1 GEN 1	TR 2 GEN 2	TR 1 GEN 1	TR 1 GEN 1 (1)	TR 1 GEN 1 (1)
TR 1 FAULT and ESS TR FAULT						TR 2 GEN 2 (1)	TR 2 GEN 2	TR 2 GEN 2 (1)	–	–
TR 2 FAULT and ESS TR FAULT						TR 1 GEN 1	TR 1 GEN 1 (1)	TR 1 GEN 1	–	–

(1) *Lost in case of overcurrent on the faulty TR.*

(2) *In case of differential protection failure :*

- *The affected generator is not replaced ;*
- *The associated TR is switched off.*

EMER CONFIG	**AC BUS 1**	**AC BUS 2**	**AC ESS BUS**	**AC ESS GND**	**AC ESS SHED**	**AC LAND REC**
• BATTERIES ONLY (in flight)	–	–	STAT INV BAT 1-2	–	–	STAT INV BAT 1-2
• EMER GEN SUPPLIED BY ENGINE DRIVEN PUMP	–	–	EMER GEN	–	EMER GEN	EMER GEN(1)
• EMER GEN SUPPLIED BY RAT	–	–	EMER GEN	–	–	EMER GEN(1)

(1) *Supplied when LAND RECOVERY pushbutton is at ON.*

EMER CONFIG	**DC BUS 1**	**DC BUS 2**	**DC BAT BUS**	**DC ESS BUS**	**DC ESS SHED**	**DC LAND REC**	**SHED LAND REC**
• BATTERIES ONLY (in flight)	–	–	(2)	BAT 1-2	–	BAT 1-2	–
• EMER GEN SUPPLIED BY ENGINE DRIVEN PUMP	–	–	–	ESS TR EMER GEN	ESS TR EMER GEN	ESS TR EMER GEN(1)	ESS TR EMER GEN(1)
• EMER GEN SUPPLIED BY RAT	–	–	–	ESS TR EMER GEN	–	ESS TR EMER GEN(1)	–

(1) *Supplied when LAND RECOVERY pushbutton is at ON.*

(2) *Lost after 7 s.*

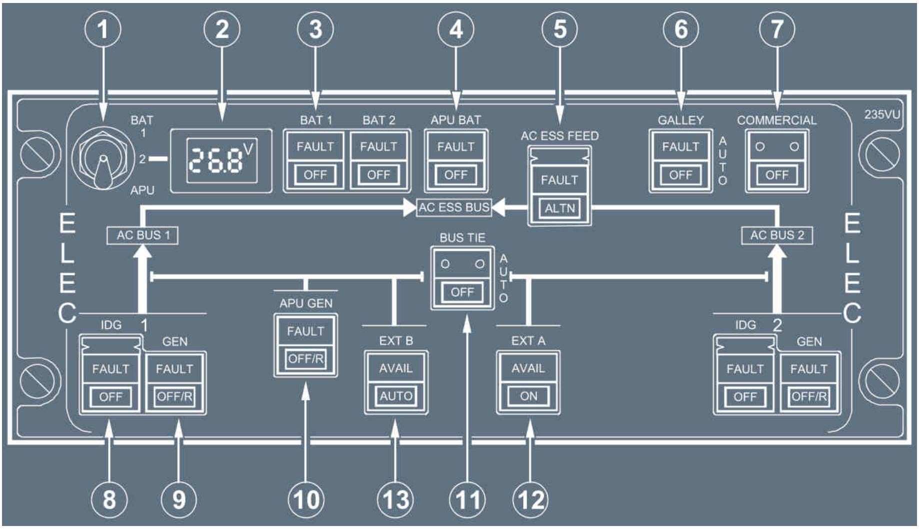
ON GROUND	**AC BUS 1**	**AC BUS 2**	**AC ESS BUS**	**AC ESS GND**	**AC ESS SHED**	**AC LAND REC**
BAT only, V > 50 kt	–	–	STAT INV BAT 1-2	–	–	STAT INV BAT 1-2
BAT only, V ≤ 50 kt	–	–	STAT INV BAT 1-2	STAT INV BAT 1-2	–	STAT INV BAT 1-2

ON GROUND	DC BUS 1	DC BUS 2	DC BAT BUS	DC ESS BUS	DC ESS SHED	DC LAND REC	SHED LAND REC
BAT only, V > 50 kt	–	–	–	BAT 1-2	–	BAT 1-2	–
BAT only, V ≤ 50 kt	–	–	BAT 1-2	BAT 1-2	–	BAT 1-2	–

Intentionally left blank

OVERHEAD PANEL

Ident.: DSC-24-20-00018022.0001001 / 09 NOV 17
Applicable to: ALL


1
2
3
4
5
6
7
BAT
1
2
APU
26.8 V
BAT 1
BAT 2
FAULT
OFF
APU BAT
AC ESS FEED
FAULT
ALTN
GALLEY
AUTO
COMMERCIAL
235VU
ELEC
AC ESS BUS
AC BUS 1
AC BUS 2
BUS TIE
OFF
AUTO
APU GEN
FAULT
OFF/R
EXT B
AVAIL
AUTO
EXT A
AVAIL
ON
IDG 1
GEN
IDG 2
8
9
10
13
11
12

(1) BAT 1(2 or APU) selector
Selects the battery for voltage indication.

(2) BAT 1 (2 or APU) Voltage Indication
Selected battery voltage.

(3) BAT 1(2) pb-sw
Controls the operation of the corresponding Battery Charge Limiter.

Auto : The Battery Charge Limiter controls automatically the connection and the disconnection of the corresponding battery to the DC BAT BUS by closing and opening of the battery line contactor.

- The batteries are connected to the DC BAT BUS in the following cases:
  - Battery voltage below 26.5 V (battery charge). The charging cycle ends when battery charge current goes below 4 A (for 10 s on ground, 15 min in flight)
  - On the ground (with speed below 50 kt), when batteries only are supplying the aircraft
  - In flight DC generation lost (limited to 7 s).
- The batteries are connected to the DC ESS BUS when batteries only are supplying:
  - In flight,
  - On ground, speed above 50 kt,
  - On ground, speed below 50 kt, provided they are both selected auto.

Note: 1. *In normal configuration the batteries are disconnected most of the time.*
2. *A battery automatic cut off logic prevents batteries from discharging completely when the aircraft is on the ground (parking).*

Automatic battery contactors open when:
- *The aircraft is on the ground*
- *The main power supply (external power plus all generators) is cut off*
- *The battery voltage is lower than 23 V for more than 16 s.*

The flight crew can reset the contactors by switching the BAT pb-sw to OFF then to AUTO.

OFF : The Battery Charge Limiter is not operating, the DC ESS BUS is not connected to the battery (except in flight in emergency configuration).
OFF comes on white if the DC BAT BUS is powered.
Hot buses remain supplied.

FAULT lt : Comes on amber associated with an ECAM caution, when the charging current for corresponding battery is outside limits.
In this case the battery contactor opens.

(4) APU BAT pb-sw
Controls the operation of the APU Battery Charge Limiter.

AUTO :	The APU Battery Charge Limiter automatically controls the closure/opening of the line APU BAT contactor. The battery is connected in the following cases: • To ensure battery charge (as for BAT 1 or 2) • When the APU start sequence is initiated. *Note: Automatic cut off, as for BAT 1 or 2, is provided.*
OFF :	The Battery Charge Limiter is not operating, the battery line contactor is open. OFF light illuminates.
FAULT lt :	Comes on amber associated with an ECAM caution as for BAT 1 or 2. In this case the battery contactor opens.

(5) AC ESS FEED pb-sw (guarded)

Normal :	The AC ESS BUS is supplied from AC BUS 1. It is automatically supplied by the AC BUS 2 when the AC BUS 1 is lost.
ALTN :	The AC ESS BUS is supplied from AC BUS 2.
FAULT lt :	Comes on amber associated with an ECAM caution when the AC ESS BUS is not electrically supplied. *Note: In case of total loss of main generators the AC ESS BUS is automatically supplied by the emergency generator or by the static inverter if the emergency generator is not available.*

(6) GALLEY pb-sw

AUTO :	The galleys are normally supplied. The ECMU automatically controls the shedding of one or more galleys in case of generator(s) failure or in case of overload detection. On ground when APU generator or the external power supplies, all galleys are supplied provided no overload is detected.
OFF :	All galleys are shed. Water/Waste (drain mast) ice protection is lost. The electrical supply of the heating floor panels is shed.
FAULT lt :	Comes on amber associated with an ECAM caution in case of overload detection if the automatic shedding is not performed. *Note: Switching OFF then AUTO resets the galleys which have been automatically shed by the ECMU.*

(7) COMMERCIAL pb

OFF : The following equipment is shed:
- Galleys
- Cargo loading system
- Electrical service
- Escape slide lock mechanism ice protection
- Water/waste (drain mast) ice protection
- Lavatory and cabin lights
- Water heater
- In-seat power supply ◁
- Passenger entertainment system ◁ .

(8) IDG 1 (2, 3 or 4) (Integrated Drive Generator) pb (guarded)

CAUTION	1. If the pushbutton is pressed for more than about 3 s , damage may occur to the disconnection mechanism. 2. IDG disconnection is inhibited when the engine is stopped or below idle.

IDG switches are normally spring loaded out.
Pressing this switch disconnects the IDG from its drive shaft. Only maintenance personnel can reconnect it.

FAULT lt : Comes on amber associated with an ECAM caution in case of:
- IDG oil outlet overheat (above 185 °C), or
- IDG oil pressure low. Inhibited when the engine is stopped or below idle.

It goes off when the IDG is disconnected.

(9) GEN 1(2) pb

On : The generator field is energized and the line contactor closes, provided electrical parameters are normal.

OFF/R : The generator field is de-energized and the line contactor opens.
The associated Generator Control Unit (GCU) is reset.

FAULT lt : Comes on amber associated with an ECAM caution in the event of protection trip initiated by the associated Generator Control Unit (GCU).
The line contactor opens.

Note: If the protection trip is initiated by a differential fault, the reset action has no effect after two attempts.

(10) APU GEN pb-sw

On :	The APU generator field is energized and the line contactor closes provided parameters are normal. Each bus tie contactor 1 and (or) 2 automatically closes if its associated generator is not operative.
OFF/R :	The generator field is de-energized and the line contactor opens. The associated Generator Control Unit (GCU) is reset.
FAULT lt :	Same as GEN FAULT. APU GEN FAULT light is inhibited when APU speed is too low.

(11) BUS TIE pb-sw

AUTO :	The three BUS TIE contactors open or close automatically according to the priority logic in order to maintain power supply to all AC buses. The three contactors close when: - only one engine generator supplies the aircraft, or - only the APU generator or single ground power unit supplies the aircraft.
OFF :	The three BUS TIE contactors open.

(12) EXT A pb

AVAIL lt :	Illuminates green provided external power parameters are normal.
Momentarily pressed :	- If the AVAIL light was on: • The external power line contactor closes • The AVAIL light goes off • The ON light comes on blue. - If the ON light was illuminated: • The external power line contactor opens • The ON light goes off • The AVAIL light comes on.

(13) EXT B pb

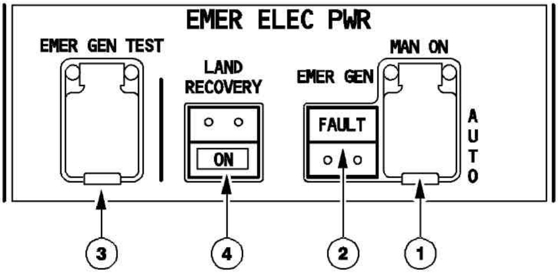
AVAIL lt :	Illuminates green provided external power parameters are normal.

Momentarily pressed :
- If the AVAIL light was on:
  - Provided the APU generator is off the external power line contactor closes
  - The AVAIL light goes off
  - The AUTO light comes on.
- If the AUTO light was on:
  - The external power line contactor opens
  - The AUTO light goes off
  - The AVAIL light comes on.

Note: *1. The APU generator has priority over external power (A and B) for AC BUS 1.*
The external power A has priority over the APU generator for AC BUS 2.
The APU generator has priority over external power B for AC BUS 2.
The engine generators have priority over the external power or APU.
The external power B has priority over external power A for AC BUS 1.
2. When external power B is selected AUTO, AUTO light remains illuminated even when the APU generator has taken over.

ELEC EMER PANEL

Ident.: DSC-24-20-00018024.0005001 / 21 MAR 16
Applicable to: ALL



(1) MAN ON pb (guarded)

AUTO : In case of normal AC supply loss in flight, the emergency generator is automatically started.

Pressed The emergency generator runs and is connected to the aircraft network.

(2) EMER GEN FAULT lt

The light comes on red, if the emergency generator is not supplying and normal AC supply is lost in flight.

(3) TEST pb (guarded)

Pressed and held	:	The emergency generator runs (provided the green hydraulic system is pressurized) and supplies the DC ESS BUS and the AC ESS BUS.

(4) LAND RECOVERY pb-sw

ON When pressed, with the emergency generator running, the AC LAND RECOVERY and the DC LAND RECOVERY buses are recovered and the following equipment are restored:

- LGCIU 1
- SFCC 1 (flap channel is not recovered, if the emergency generator is powered by the RAT).
- BSCU channel 1 (not recovered, if the emergency generator is powered by the RAT)
- LH windshield anti-ice (not recovered, if the emergency generator is powered by the RAT)
- LH landing light (not recovered, if the emergency generator is powered by the RAT)

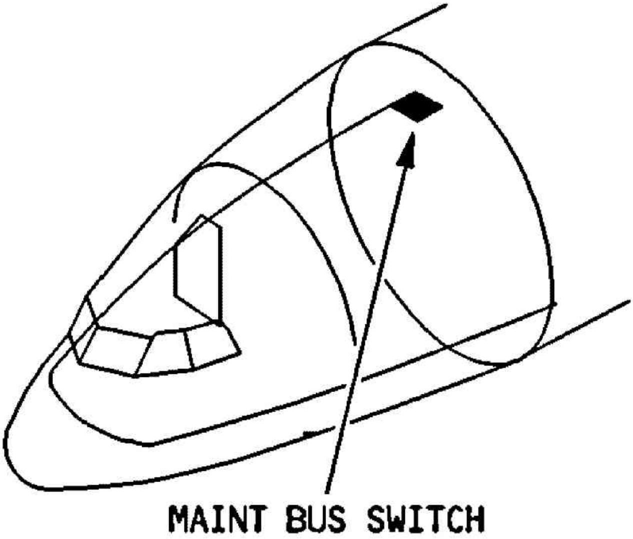
The remaining fuel pump (if any) is lost.

Note: The remaining fuel pump will be shed at 260 kt, if the emergency generator is powered by the RAT, or at LAND RECOVERY selection, whichever occurs first.

When the LAND RECOVERY pb-sw is pressed in EMER ELEC configuration, ADR 3 is lost, and consequently, AP 1 is lost.

FORWARD CABIN

Ident.: DSC-24-20-00000995.0002001 / 21 MAR 16
Applicable to: ALL



This switch allows maintenance and ground service personnel to energize electrical circuits for ground servicing, without energizing the aircraft's entire electrical system.

ON : The selector latches magnetically, provided the external power A parameters are normal (AVAIL light is on). The AC and DC GRND/FLT busbars are supplied and the following services can be energized :

- Passenger compartment lighting
- Galley lighting
- Entrance area lights
- Lavatory lighting and service
- Vacuum cleaner outlets
- Flight compartment service outlets
- Flight compartment flood lighting
- Fuel quantity indications
- Refueling
- Lower deck cargo compartment lighting and power outlets.
- Main and nose landing gear compartment lighting
- Hydraulic compartment lighting
- Landing gear compartment service outlets
- Ground call
- Equipment compartment lights and service outlets
- Navigation lights
- Escape slide locking mechanism ice protection ❄
- Parking brake
- Cargo door hydraulic pump

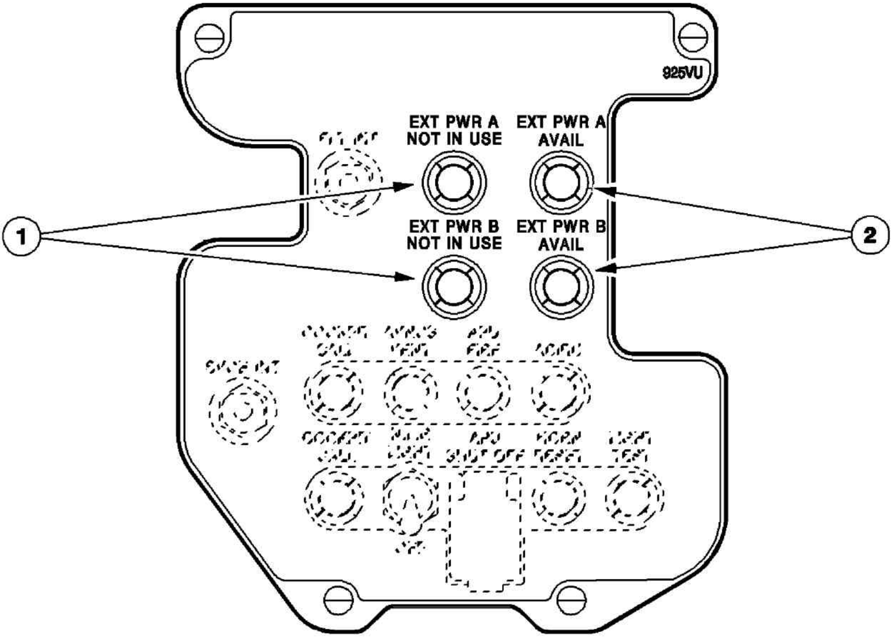
The switch trips, when the external source is removed.

OFF : The AC and DC GRND/FLT busbars are connected to AC BUS 2 and DC BUS 2.

EXTERNAL POWER PANEL

Ident.: DSC-24-20-00000997.0001001 / 17 FEB 11
Applicable to: ALL

(This panel is located closed to the external power connector)


925VU
EXT PWR A NOT IN USE
EXT PWR A AVAIL
EXT PWR B NOT IN USE
EXT PWR B AVAIL
1
2

(1) EXT PWR A (B) not in Use
This white light comes on to inform the ground personnel that the ground power unit is not supplying the aircraft network and can be disconnected. It goes off if EXT A (B) is in use.

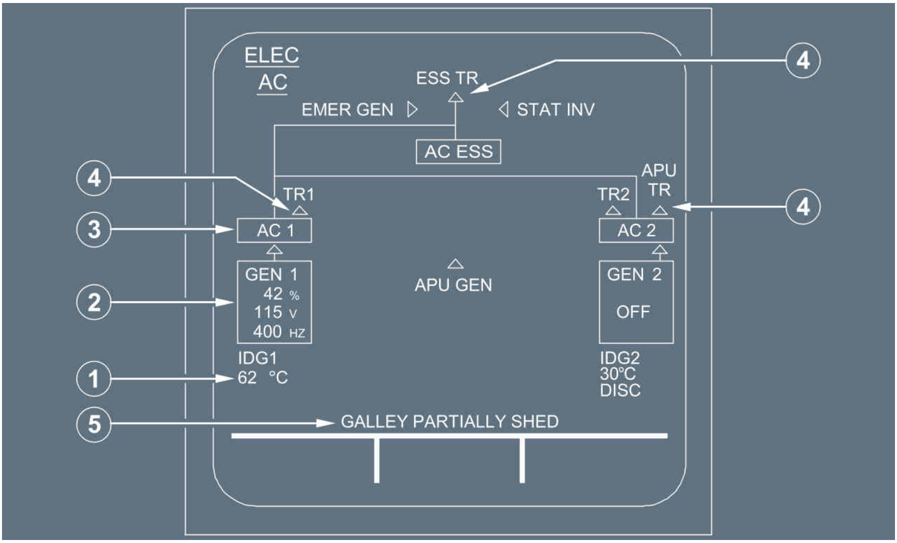
(2) EXT PWR A (B) Avail
This amber light comes on to indicate that external power is available and the voltage is correct.

ELEC AC ECAM PAGE

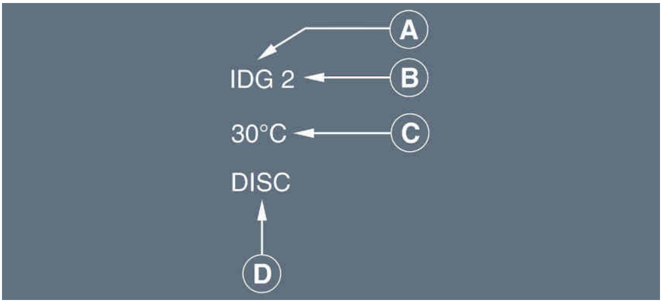
Applicable to: ALL

Ident.: DSC-24-20-A-00018028.0001001 / 29 JUN 16

FLIGHT CONFIGURATION


ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU
TR
TR1
TR2
AC 1
AC 2
GEN 1
42 %
115 V
400 HZ
APU GEN
GEN 2
OFF
IDG1
62 °C
IDG2
30°C
DISC
GALLEY PARTIALLY SHED
4
3
2
1
5
4
4

(1) IDG Indications


IDG 2
30°C
DISC
A
B
C
D

(A)

IDG Indication:
- normally white
- amber in case of:
  - IDG outlet temperature overheat (above 185 °C) or,
  - IDG oil low pressure or,
  - IDG disconnection.

(B)

IDG number:
- white if associated engine is running
- amber if stopped.

(C)

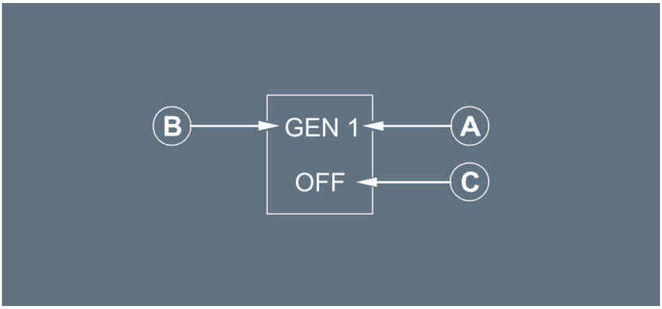
Outlet oil temperature:
- Normally green.
- Green, pulsing in case of advisory (above 151 °C).
- Amber in case of overheat (above 185 °C).

(D)

DISC/LO PR indication:
- DISC appears in amber, if the IDG is disconnected.
- LO PR appears in amber, if an oil low pressure occurs when the IDG is connected. It is inhibited at low engine speed (N2 below 14 %).

(2) GEN 1 (or 2) indications

When the GEN pushbutton is OFF:

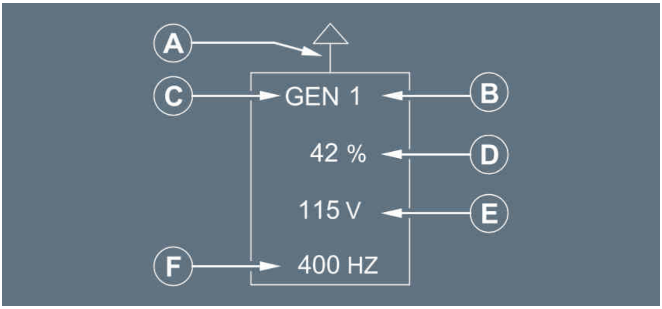


(A) The GEN number is white, if the associated engine is running. It becomes amber, when the associated engine stops.

(B) The GEN indication is amber.

(C) The OFF indication is white.

When the GEN pushbutton is ON:



(A) The arrow indication is green, when the generator line contactor is in line.

(B) The GEN number is white, if the associated engine is running. It becomes amber, when the associated engine stops.

(C) The GEN indication is normally white. It becomes amber, when the generator fails, or when the associated engine stops.

(D) The GEN load is normally green. It becomes amber, if the load is greater than 108 %, for more than 10 s.

(E) The GEN voltage is normally green. It becomes amber below 110 V, or above 120 V.

(F) The GEN frequency is normally green. It becomes amber below 390 Hz, or above 410 Hz.

(3) Bus bar indication
The bus bar indication is normally green. It becomes amber, when the corresponding bar is not powered.

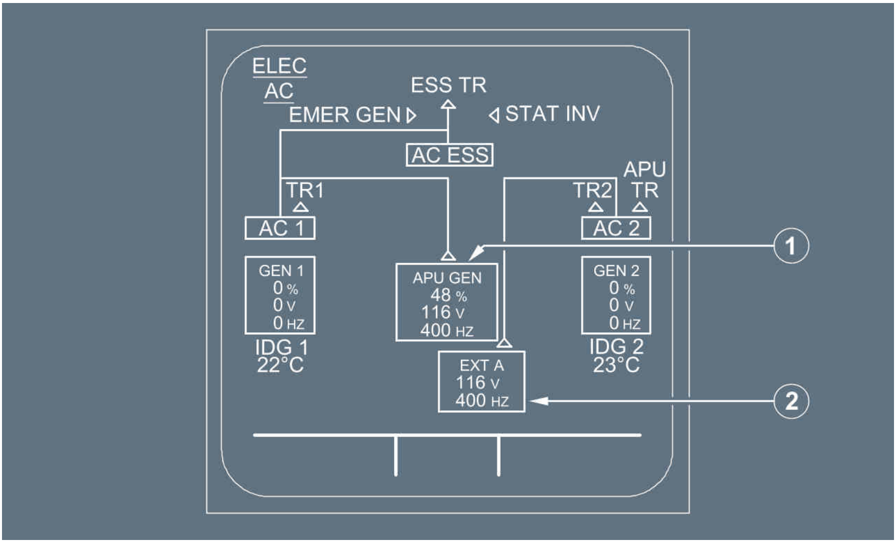
(4) TR indication
The TR indication is normally white. It becomes amber, when the TR fails or in case of abnormal current.

(5) Galley indication

The following legend appears in white, when applicable, depending on the order of priority (1: highest priority):
1. COMMERCIAL OFF
2. GALLEY SHED
3. GALLEY PARTIALLY SHED

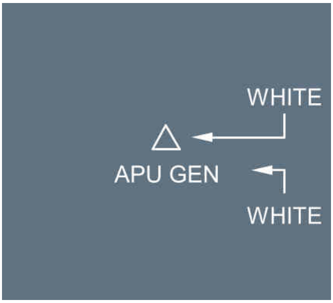
Ident.: DSC-24-20-A-00001000.0002001 / 09 OCT 12

GROUND CONFIGURATION

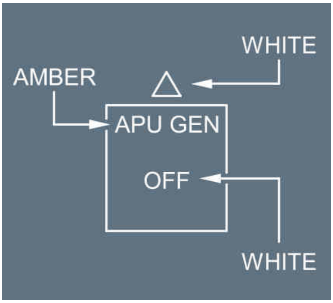

ELEC
AC
ESS TR
EMER GEN
STAT INV
AC ESS
APU
TR1
TR2
TR
AC 1
AC 2
GEN 1
0 %
0 V
0 HZ
IDG 1
22°C
APU GEN
48 %
116 V
400 HZ
GEN 2
0 %
0 V
0 HZ
IDG 2
23°C
EXT A
116 V
400 HZ
1
2

(1) APU Generator

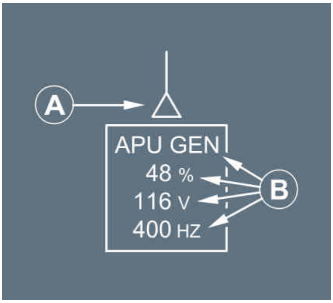
- When APU MASTER SW pushbutton is off:


WHITE
APU GEN
WHITE

- When APU MASTER SW pushbutton is ON and APU GEN pushbutton is OFF:


WHITE
AMBER
APU GEN
OFF
WHITE

- When APU MASTER SW pushbutton is ON and APU GEN pushbutton is on:


A
APU GEN
48 %
116 V
400 HZ
B

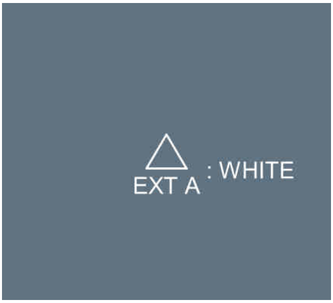
(A)

- green when APU generator supplies one or more AC bus bar
- white otherwise

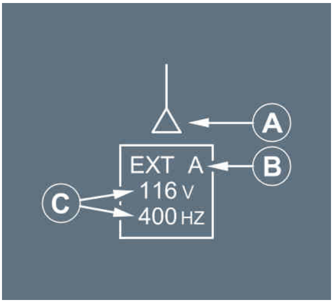
(B) same logic as engine generator

(2) External power A (External power B symbol appears beside with the same principle):
(only displayed when aircraft is on ground)

- When external power is not available



- When external power is available



(A)

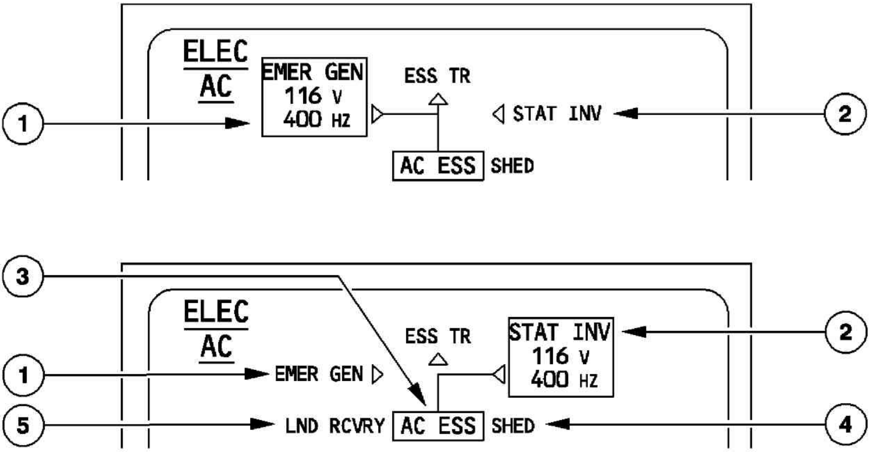
- green when external power supplies one or more bus bar
- white otherwise

(B) white

(C) same as engine generator

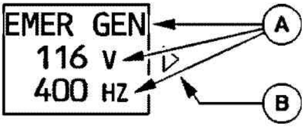
Ident.: DSC-24-20-A-00001026.0001001 / 16 MAR 11

EMER CONFIGURATION


ELEC
AC
EMER GEN
116 V
400 HZ
ESS TR
STAT INV
AC ESS
SHED
1
2
ELEC
AC
EMER GEN
ESS TR
STAT INV
116 V
400 HZ
LND RCVRY
AC ESS
SHED
3
1
5
2
4

(1) Emergency Generator

- When the emergency generator contactor is closed:


EMER GEN
116 V
400 HZ
A
B

(A) same logic as engine generator

(B) green

- When the EMER GEN Contactor is open:
  EMER GEN▷ : It is white.
  EMER GEN : It becomes amber when faulty.

(2) Static Inverter
Same logic as the emergency generator.

(3) AC ESS BUS

- It is normally green
- It becomes amber when the bus is not supplied.

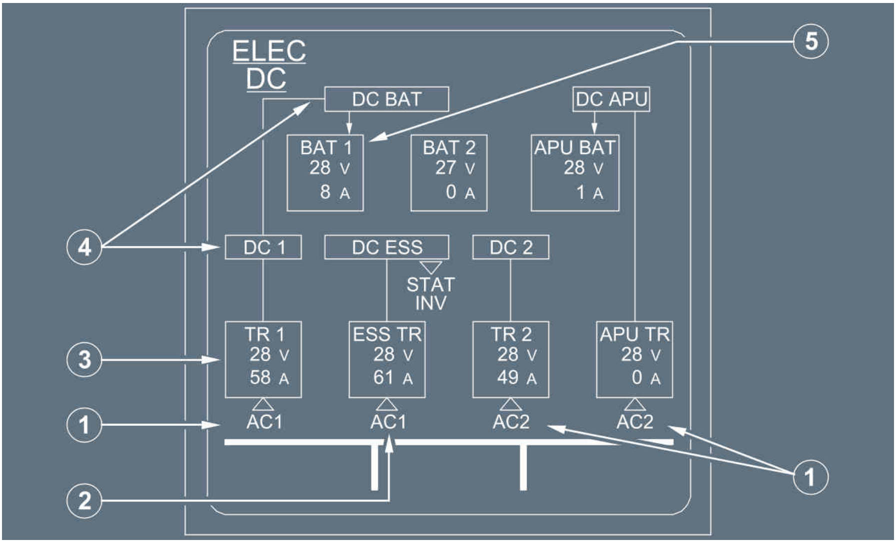
(4) SHED Indication
It appears in amber, when AC ESS SHED BUS is not supplied.

(5) LND RCVRY indication
Appears in green when LAND RECOVERY pushbutton is pressed.

ELEC DC ECAM PAGE

Ident.: DSC-24-20-00001028.0002001 / 22 MAY 12
Applicable to: ALL

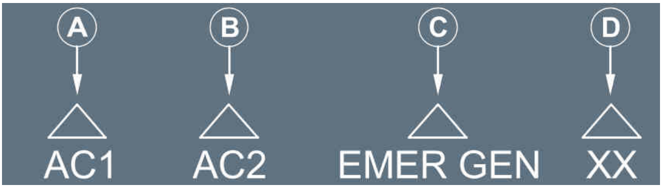
NORMAL CONFIGURATION


ELEC
DC
DC BAT
DC APU
BAT 1
28 V
8 A
BAT 2
27 V
0 A
APU BAT
28 V
1 A
DC 1
DC ESS
DC 2
STAT
INV
TR 1
28 V
58 A
ESS TR
28 V
61 A
TR 2
28 V
49 A
APU TR
28 V
0 A
AC1
AC1
AC2
AC2
1
2
3
4
5
1

(1) TR 1 (or TR 2 or APU TR) Power Supply

- It is normally white
- its becomes amber when the busbar is not powered.

(2) ESS TR Power Supply



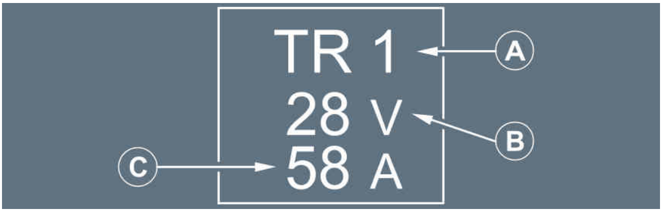
(A) Appears in white, when the AC 1 busbar supplies the TR.

(B) Appears in white, when the AC 2 busbar supplies the TR.

(C) Appears in white, when the emergency generator is not failed, and supplies the ESS TR.
Appears in amber, when the emergency generator is failed, and is connected to the ESS TR.

(D) Appears in amber in all other cases (ESS TR not supplied, or information not available).

(3) Transformer Rectifier (1, 2, APU, and ESS)



(A) TR Indication:

- Appears in white
- Appears in amber, when the voltage or the current (value) is abnormal, or when the TR is failed (overheat, minimum current, overcurrent, open or short circuit).

(B) Voltage:

- Appears in green
- Appears in amber, when the voltage is less than 25 V, or greater than 31 V.

Note: *For APU TR, voltage indication remains green, even if abnormal during APU start.*

(C) Current:

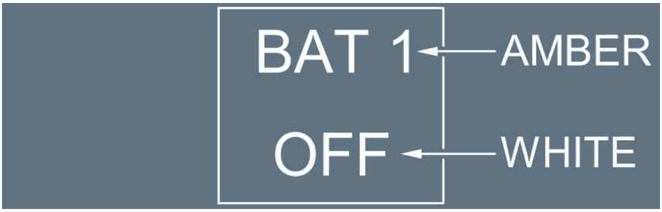
- Appears in green
- Appears in amber, when the TR is failed or the current is less than 2 A.

(4) DC BUS bars

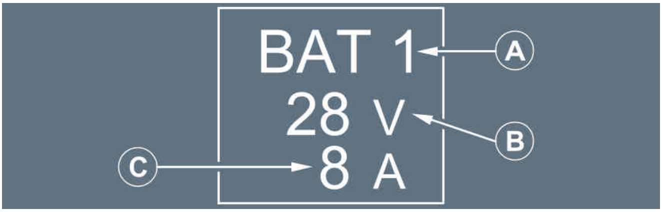
- normally green
- amber if no voltage on the bar

(5) Batteries

- if BAT pb is selected OFF



- if BAT pb is selected AUTO



(A) BAT Indication

- normally white
- amber if the battery is faulty

(B) Voltage

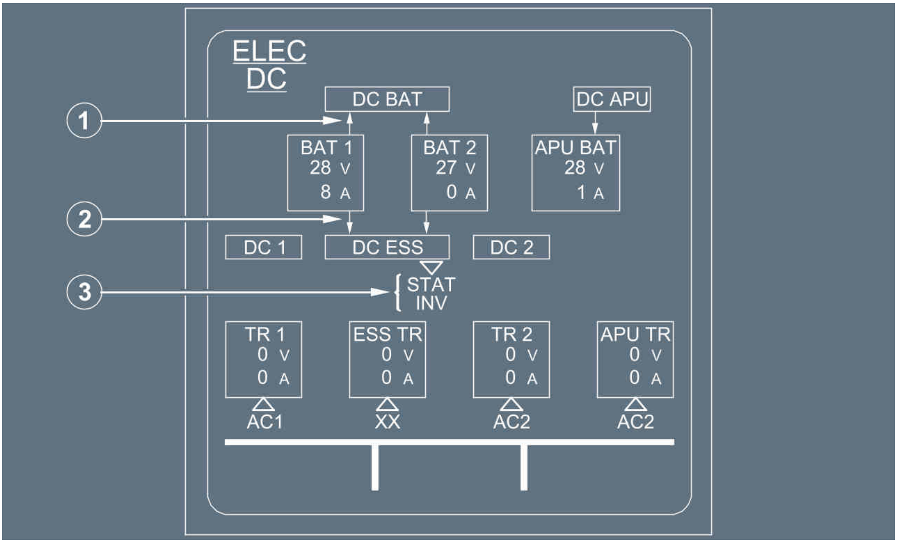
- normally green
- amber below 25 V or above 31 V

(C) Current (charge or discharge):

- normally green
- amber if discharge current is above 5 A.

Note: *For APU battery, even if voltage or current is abnormal, the values remain green during APU start.*

EMERGENCY CONFIGURATION


ELEC
DC
1
2
3
DC BAT
DC APU
BAT 1
28 V
8 A
BAT 2
27 V
0 A
APU BAT
28 V
1 A
DC 1
DC ESS
DC 2
STAT
INV
TR 1
0 V
0 A
ESS TR
0 V
0 A
TR 2
0 V
0 A
APU TR
0 V
0 A
AC1
XX
AC2
AC2

(1) DC BAT–BAT Connection

- Battery Line Contactor open:
  nothing displayed
- Battery Line Contactor closed:
  ↓ green : battery charge
  ↑ amber : battery discharge

(2) DC ESS–BAT Connection

↓ amber : appears when the contactor is closed. (Batteries supplying DC ESS bus)

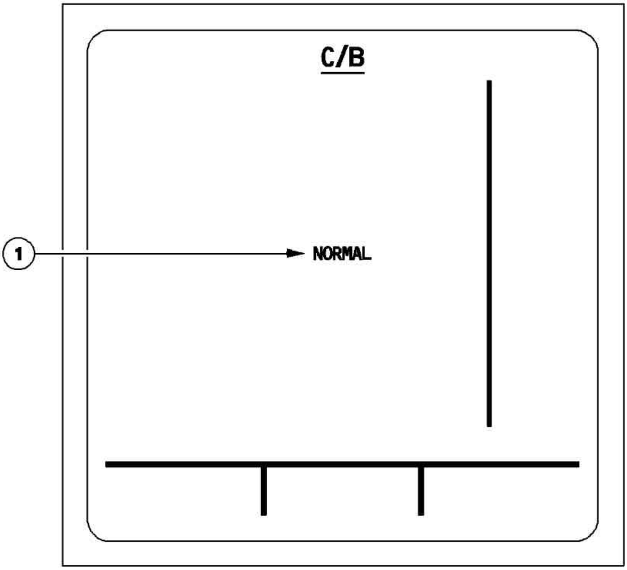
(3) Static Inverter

- normally white
- amber when the static inverter is faulty.

C/B ECAM PAGE

Ident.: DSC-24-20-00001049.0001001 / 17 FEB 11
Applicable to: ALL

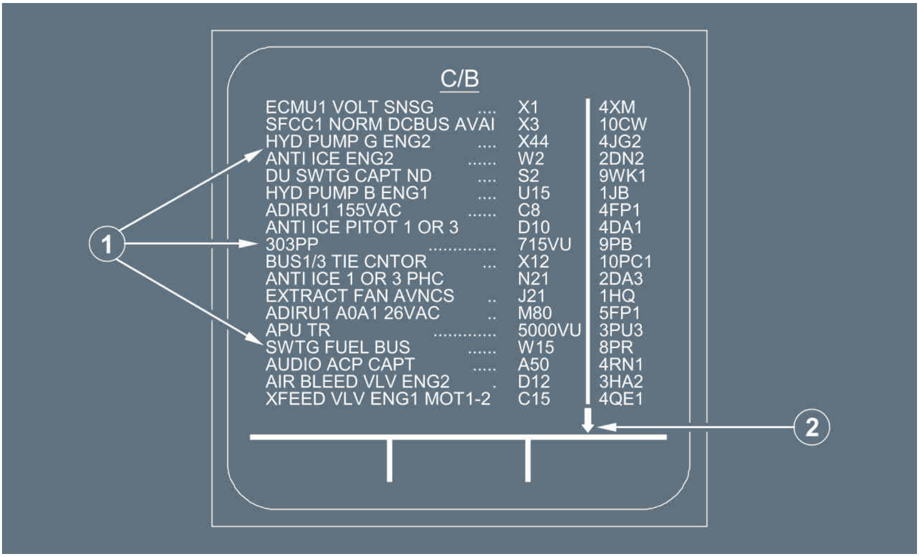
NO C/B PULLED



(1) Displayed in green when no circuit breaker is pulled.

C/B PULLED

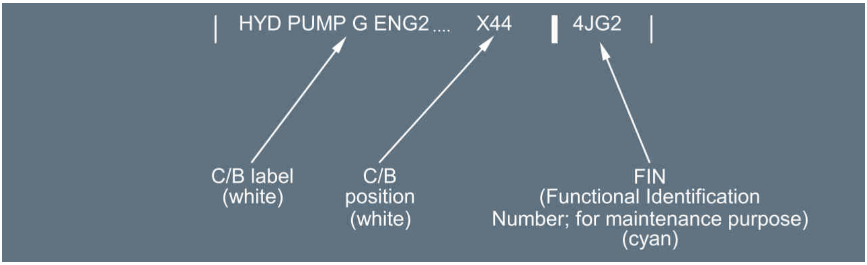
Ident.: DSC-24-20-00018032.0001001 / 21 MAR 16
Applicable to: ALL



C/B

ECMU1 VOLT SNSG	X1	4XM
SFCC1 NORM DCBUS AVAI	X3	10CW
HYD PUMP G ENG2	X44	4JG2
ANTI ICE ENG2	W2	2DN2
DU SWTG CAPT ND	S2	9WK1
HYD PUMP B ENG1	U15	1JB
ADIRU1 155VAC	C8	4FP1
ANTI ICE PITOT 1 OR 3	D10	4DA1
303PP	715VU	9PB
BUS1/3 TIE CNTOR ...	X12	10PC1
ANTI ICE 1 OR 3 PHC	N21	2DA3
EXTRACT FAN AVNCS ..	J21	1HQ
ADIRU1 A0A1 26VAC ..	M80	5FP1
APU TR	5000VU	3PU3
SWTG FUEL BUS	W15	8PR
AUDIO ACP CAPT	A50	4RN1
AIR BLEED VLV ENG2 .	D12	3HA2
XFEED VLV ENG1 MOT1-2	C15	4QE1

(1) Open Circuit Breaker Identification


HYD PUMP G ENG2....
X44
4JG2
C/B label
(white)
C/B
position
(white)
FIN
(Functional Identification
Number; for maintenance purpose)
(cyan)

The last tripped Circuit Breakers is displayed on the top of the screen.
All Circuit Breakers are monitored except commercial Circuit Breakers.

(2) Circuit Breakers Page Overflow Symbol
Displayed in green when pulled Circuit Breakers list is not closed.

Note: *1. To display the next page, press again Circuit Breaker pushbutton or CLEAR pushbutton on the ECAM control panel.*
2. A maximum of three pages is available.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-24-20-B-00017192.0001001 / 21 MAR 16

ELEC EXT PWR : This memo appears in green if external power is available. It becomes amber if more than one engine is running.

Ident.: DSC-24-20-B-00017193.0001001 / 21 MAR 16

EMER GEN : This memo appears in green when emergency generator is running.

AIRCRAFT SYSTEMS

EQUIPMENT

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DSC-25-10 Flight Deck

DSC-25-10-10 General

General....A
Principles for pushbuttons with Integrated Indications....B
General Arrangement....C

DSC-25-10-20 Cockpit Plan

General....A
Right Rear Corner....B
Left Rear Corner....C

DSC-25-10-30 Seats

Pilot Seats....A
Third Occupant Seat....B
Pilot and Third Occupant Seat Mechanical Adjustment....C
Pilot Seat Electrical Adjustment....D
Headrest Adjustment....E
Pilot Seat Inboard Armrest Adjustment....F
Pilot Seat Outboard Armrest Adjustment....G
Fourth Occupant Seat....H

DSC-25-10-40 Main Instrument Panel

Main Instrument Panel - Captain Side....A
Main Instrument Panel - First Officer Side....B

DSC-25-10-50 Pedestal

Pedestal....A

DSC-25-10-60 Overhead Panel

Overhead Panel....A

DSC-25-10-70 Foot Warmer

General....A
Controls....B

Continued on the following page

Continued from the previous page

DSC-25-12 Flight Crew Rest Compartment (If Installed)

General....A
Air Conditioning....B
Communications....C
Electrical System....D
Smoke Detection....E
Lights....F
Oxygen....G
Emergency Equipment....H
Door....I

DSC-25-14 Lower Deck

DSC-25-14-20 Lower Deck Mobile Crew Rest Compartment (LDMCR)

General....A
Doors....B
Air Conditioning....C
Communication....D
Electrical System....E
Smoke Detection....F
Fire Protection....G
Lights....H
Oxygen....I
Normal Operations....J
Abnormal Operation....K

DSC-25-20 Pax Entertainment & Connectivity Systems

DSC-25-20-10 General

General....A

DSC-25-20-20 In Seat Power Supply System (ISPSS) (If Installed)

DSC-25-20-20-10 General

General....A

DSC-25-20-20-20 Controls and Indicators

PAX PERSONAL ELEC SPLY pb-sw....A

DSC-25-20-30 Video Control Center (VCC) (If Installed)

General....A

DSC-25-20-40 In-Flight Entertainment Center (IFEC) (If Installed)

General....A

Continued on the following page

Continued from the previous page

DSC-25-20-50 Cabin Connectivity System (If Installed)

DSC-25-20-50-10 Introduction

Introduction....................A

DSC-25-20-50-20 Controls and Indicators

PASSENGER INFORMATION pb-sw ....A
PAX COM pb-sw ....B
PORTABLE EQPT & WIRELESS pb-sw C
PAX INTERNET pb-sw ....D

DSC-25-30 Emergency Equipment

Overview....................A
Cockpit Emergency Equipment....................B
Cabin Emergency Equipment....................C

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GENERAL

Ident.: DSC-25-10-10-00020758.0001001 / 17 MAR 17
Applicable to: ALL

The aircraft and system controls, required for piloting the aircraft, are arranged in such a way that the crew faces forward and all crewmembers can monitor instruments and systems. The designers concentrated system controls on the overhead panel by making extensive use of pushbuttons, directly installed in the system synoptic.

Note: *This chapter describes the panels and equipment of the basic aircraft configuration, and may not correspond to the customized configuration of a specific aircraft.*
For more information on the installed equipment or panels, refer to the relevant chapter's system description.

PRINCIPLES FOR PUSHBUTTONS WITH INTEGRATED INDICATIONS

Ident.: DSC-25-10-10-00000082.0001001 / 21 MAR 17
Applicable to: ALL

Whenever possible, pushbuttons used for corrective actions, have integrated status and failure indications.

The pushbutton positions, and their illuminated indications, follow the “lights out” principle.

- While corresponding to particular aircraft configurations, indications also have the following color codes :
  - Warnings
    RED : A failure requiring immediate action.
  - Cautions
    AMBER : A failure, of which the flight crew should be aware, but does not call for immediate action.
  - Indications
    GREEN : For normal system operation.
    BLUE : For normal operation of a system used temporarily.
    WHITE : - For an abnormal pushbutton position.
    - For a test result or maintenance information.

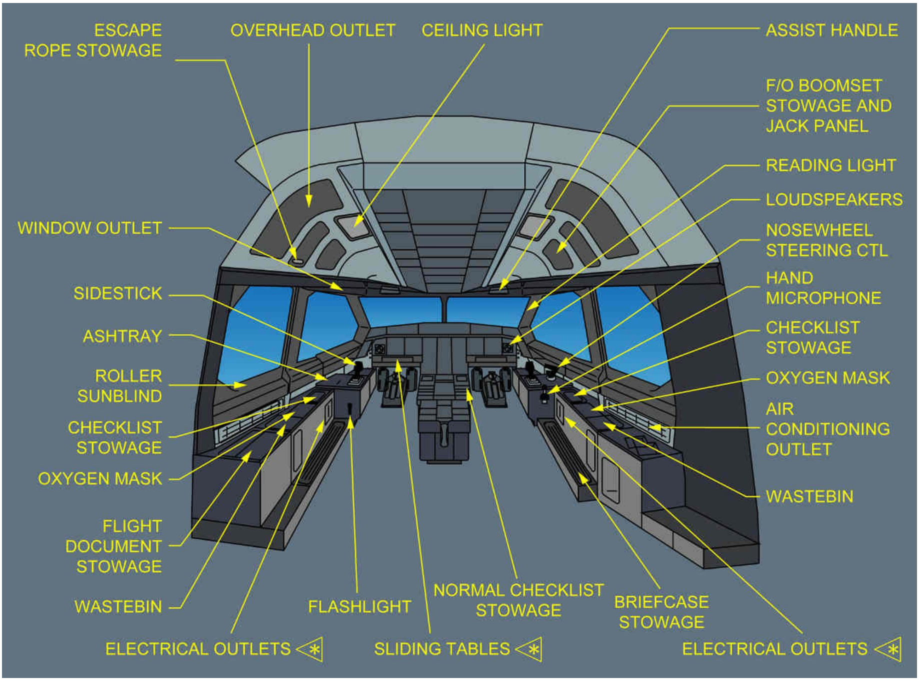
  When the aircraft is in normal configuration, only green lights can be permanently lit, whereas blue lights can be lit intermittently.
- Pushbutton positions :

POSITION	BASIC FUNCTION
Pressed In	ON, AUTO, OVRD
Released Out	OFF, MAN

Note: 1. *Certain pushbutton lights have two dots, indicating that the corresponding part of the pushbutton is not used.*
2. *Certain pushbuttons do not remain pressed in. These are referred to as "Momentary Action" pushbuttons.*

GENERAL ARRANGEMENT

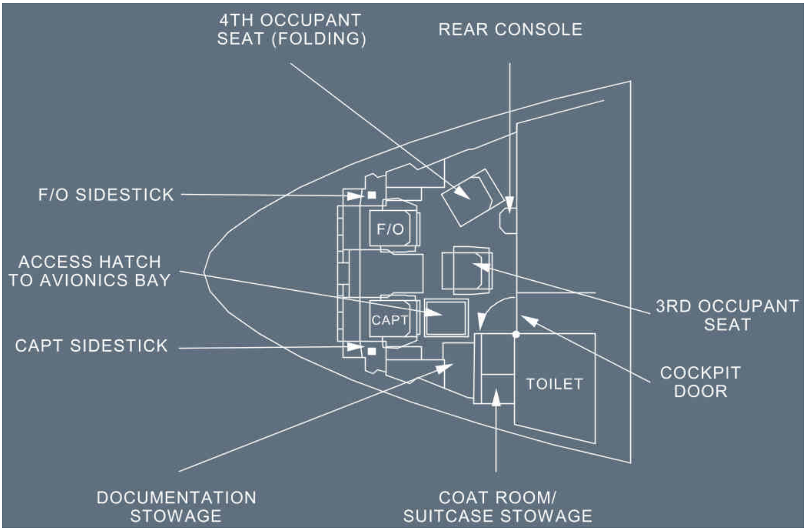
Ident.: DSC-25-10-10-00019027.0001001 / 10 MAY 21
Applicable to: ALL


ESCAPE ROPE STOWAGE
OVERHEAD OUTLET
CEILING LIGHT
ASSIST HANDLE
F/O BOOMSET STOWAGE AND JACK PANEL
READING LIGHT
LOUDSPEAKERS
WINDOW OUTLET
NOSEWHEEL STEERING CTL
SIDESTICK
HAND MICROPHONE
ASHTRAY
CHECKLIST STOWAGE
ROLLER SUNBLIND
OXYGEN MASK
CHECKLIST STOWAGE
AIR CONDITIONING OUTLET
OXYGEN MASK
WASTEBIN
FLIGHT DOCUMENT STOWAGE
WASTEBIN
FLASHLIGHT
NORMAL CHECKLIST STOWAGE
BRIEFCASE STOWAGE
ELECTRICAL OUTLETS
SLIDING TABLES
ELECTRICAL OUTLETS

GENERAL

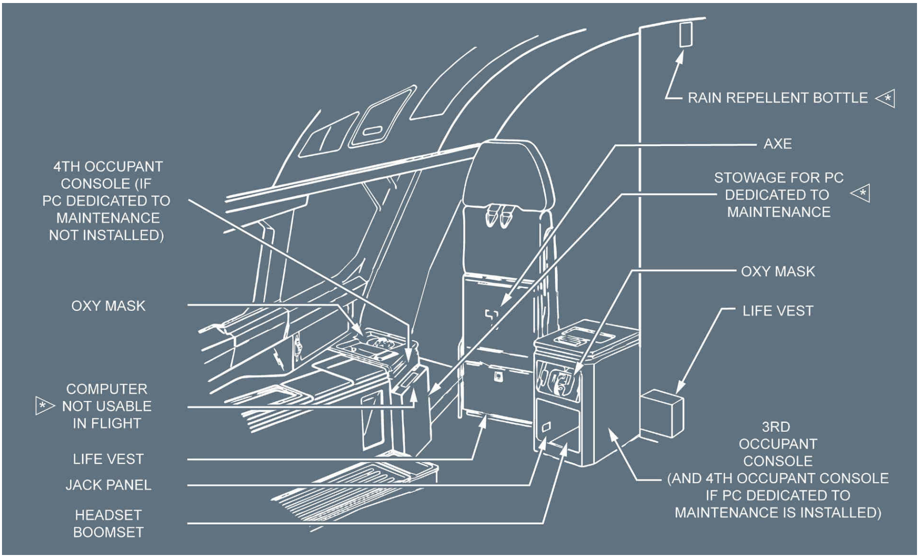
Ident.: DSC-25-10-20-00000085.0002001 / 21 MAR 17
Applicable to: ALL

The cockpit can accomodate two crew members plus two other occupants.
The two pilot seats are mounted on columns.
The third occupant seat is also mounted on column and can rotate.
The fourth occupant seat is a folding seat.


4TH OCCUPANT SEAT (FOLDING)
REAR CONSOLE
F/O SIDESTICK
F/O
ACCESS HATCH TO AVIONICS BAY
3RD OCCUPANT SEAT
CAPT
CAPT SIDESTICK
COCKPIT DOOR
TOILET
DOCUMENTATION STOWAGE
COAT ROOM/ SUITCASE STOWAGE

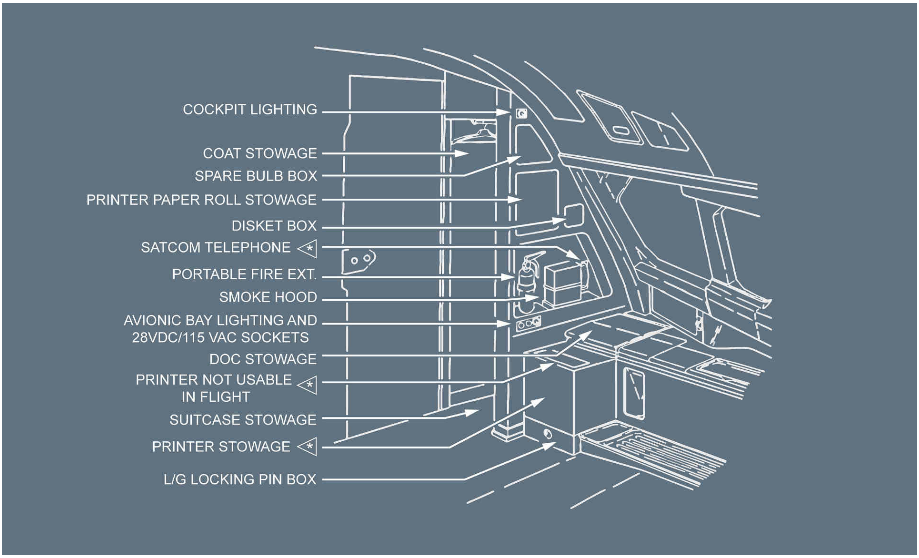
RIGHT REAR CORNER

Ident.: DSC-25-10-20-00000088.0001001 / 20 MAR 17
Applicable to: ALL


RAIN REPELLENT BOTTLE *
AXE
STOWAGE FOR PC DEDICATED TO MAINTENANCE *
OXY MASK
LIFE VEST
3RD OCCUPANT CONSOLE (AND 4TH OCCUPANT CONSOLE IF PC DEDICATED TO MAINTENANCE IS INSTALLED)
4TH OCCUPANT CONSOLE (IF PC DEDICATED TO MAINTENANCE NOT INSTALLED)
OXY MASK
* COMPUTER NOT USABLE IN FLIGHT
LIFE VEST
JACK PANEL
HEADSET BOOMSET

LEFT REAR CORNER

Ident.: DSC-25-10-20-00019028.0001001 / 20 MAR 17
Applicable to: ALL


COCKPIT LIGHTING
COAT STOWAGE
SPARE BULB BOX
PRINTER PAPER ROLL STOWAGE
DISKET BOX
SATCOM TELEPHONE
PORTABLE FIRE EXT.
SMOKE HOOD
AVIONIC BAY LIGHTING AND 28VDC/115 VAC SOCKETS
DOC STOWAGE
PRINTER NOT USABLE IN FLIGHT
SUITCASE STOWAGE
PRINTER STOWAGE
L/G LOCKING PIN BOX

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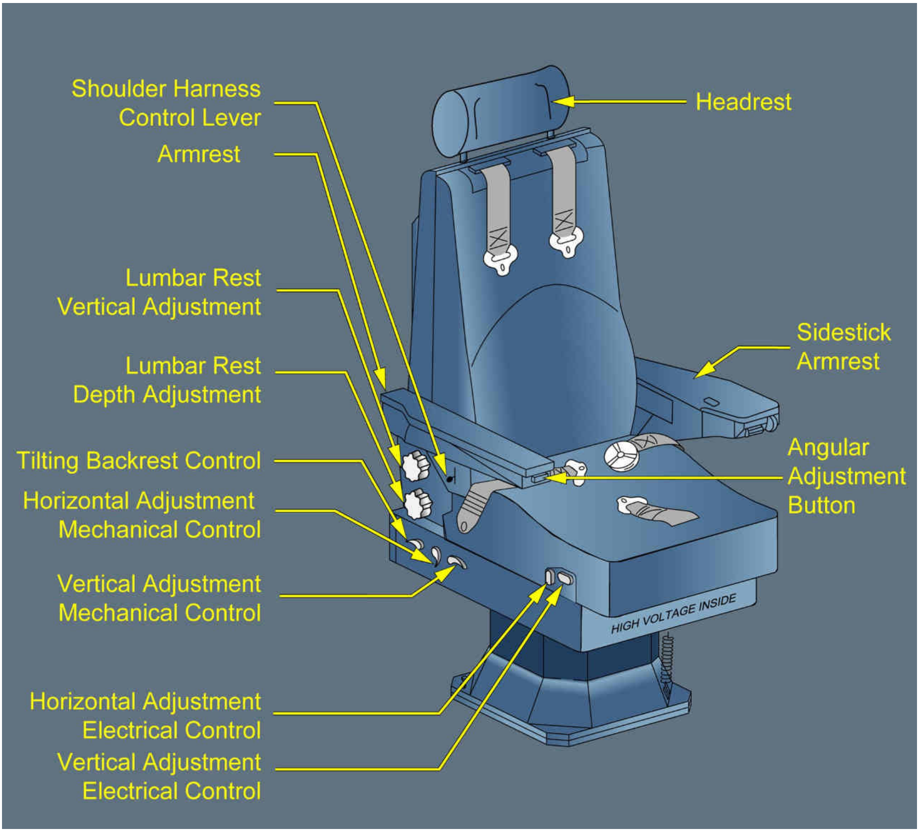
PILOT SEATS

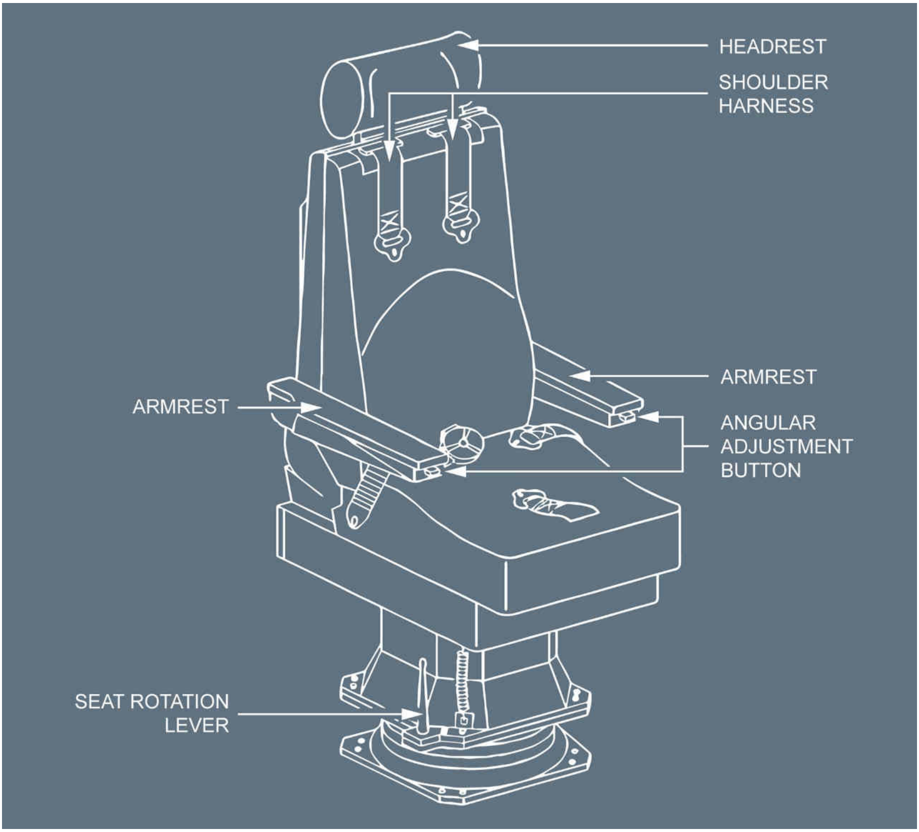
Ident.: DSC-25-10-30-00019030.0002001 / 26 NOV 19
Applicable to: ALL

The pilot seats are column-mounted and are electrically adjusted.


Shoulder Harness Control Lever
Armrest
Lumbar Rest Vertical Adjustment
Lumbar Rest Depth Adjustment
Tilting Backrest Control
Horizontal Adjustment Mechanical Control
Vertical Adjustment Mechanical Control
Horizontal Adjustment Electrical Control
Vertical Adjustment Electrical Control
Headrest
Sidestick Armrest
Angular Adjustment Button
HIGH VOLTAGE INSIDE

THIRD OCCUPANT SEAT

Ident.: DSC-25-10-30-00019040.0002001 / 20 MAR 17
Applicable to: ALL


HEADREST
SHOULDER HARNESS
ARMREST
ARMREST
ANGULAR ADJUSTMENT BUTTON
SEAT ROTATION LEVER

PILOT AND THIRD OCCUPANT SEAT MECHANICAL ADJUSTMENT

Ident.: DSC-25-10-30-00000096.0001001 / 26 NOV 19
Applicable to: ALL

To adjust a seat mechanically, the occupant must lift the appropriate control handle. This unlocks the seat so that it may be moved. Releasing the control handle returns it to the springloaded locked position. Pilot seat mechanical adjustment is a backup : The seat should be adjusted electrically.

When aligned with the aircraft's centerline, and in the maximum forward position, the third occupant's seat can be rotated by using the rotation lever, located on the seat base.

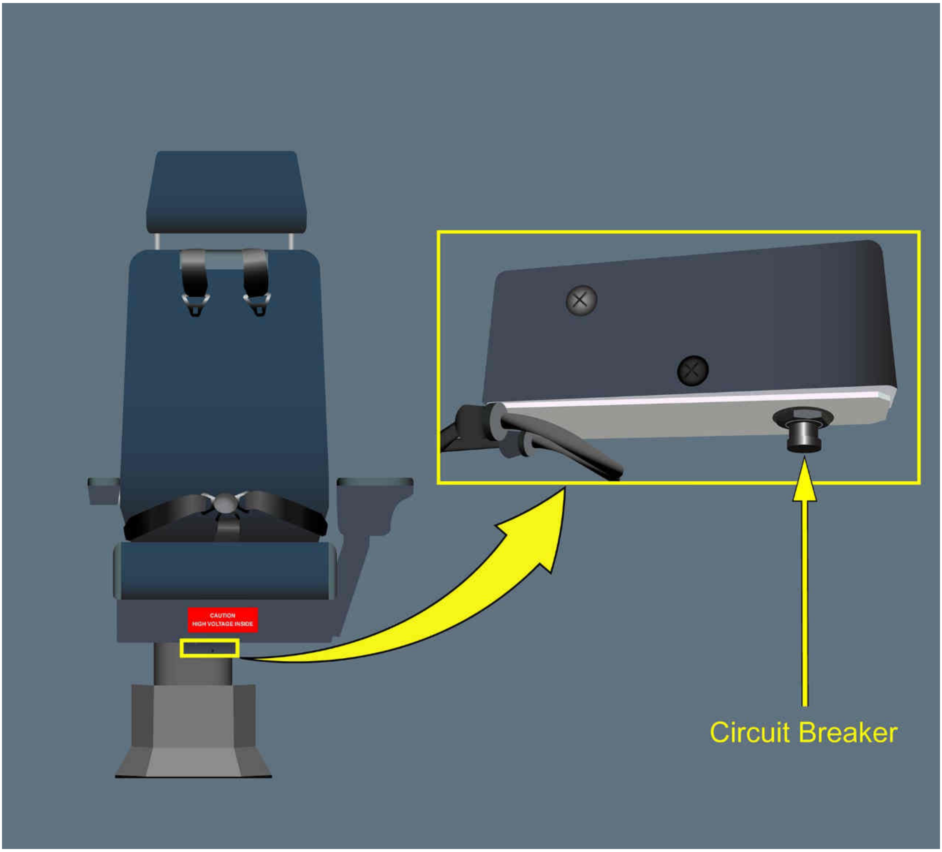
To adjust the vertical position of the lumbar cushion, the occupant must perform all of the following:
- Pull the control handle to the unlocked position
- Turn the control handle, in order to adjust the position of the cushion
- Push the control handle to the locked position.

PILOT SEAT ELECTRICAL ADJUSTMENT

Ident.: DSC-25-10-30-00000098.0001001 / 26 NOV 19
Applicable to: ALL

To electrically adjust a seat, the occupant must press the appropriate control switch in the desired direction. When the seat reaches the desired position, the occupant must release the control switch. The control switch then returns to the spring-loaded neutral position.

L2 Note: *A circuit breaker is under the seat. When this circuit breaker is pulled, it stops the electrical power to the seat.*



HEADREST ADJUSTMENT

Ident.: DSC-25-10-30-00000101.0001001 / 21 MAR 17
Applicable to: ALL

To adjust the headrest in inclination, the occupant must press the inclination control button, and release it to lock the position.
To control the height of the headrest, the occupant must push it horizontally, then adjust the height. Once released, it locks the position.

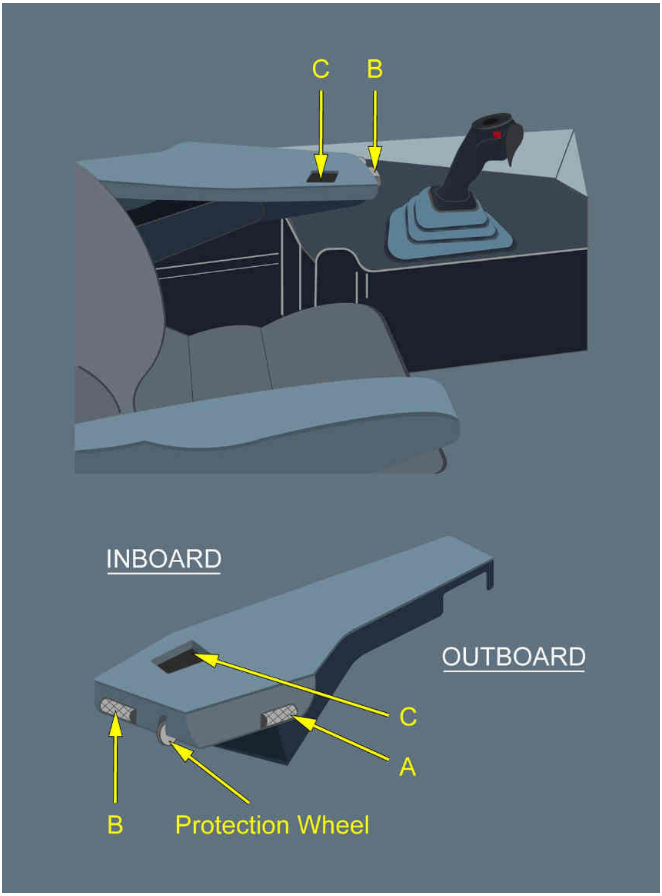
PILOT SEAT INBOARD ARMREST ADJUSTMENT

Ident.: DSC-25-10-30-00000102.0001001 / 21 MAR 17
Applicable to: ALL

To adjust the inboard armrest, the occupant must turn the knurled knob, located on the bottom surface of the armrest.

PILOT SEAT OUTBOARD ARMREST ADJUSTMENT

Ident.: DSC-25-10-30-00000103.0001001 / 26 NOV 19
Applicable to: ALL



The position of the armrest adjusts as follows:

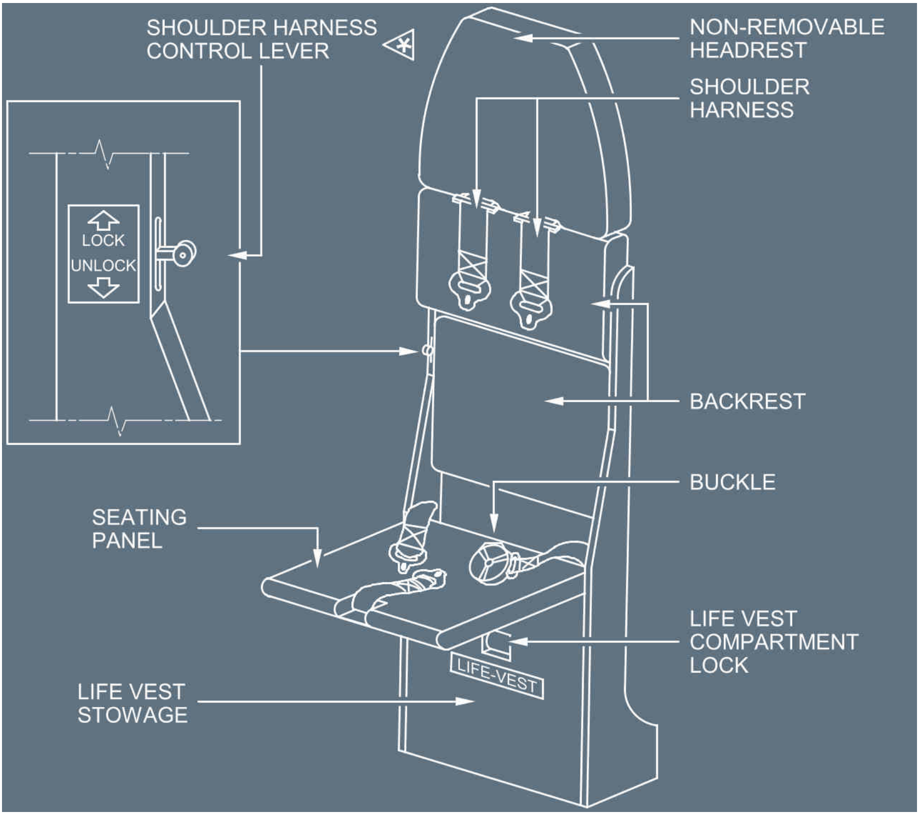
A - Height adjustment
B - Pitch adjustment

The armrest also has a memory display (C) that displays pitch and height.

FOURTH OCCUPANT SEAT

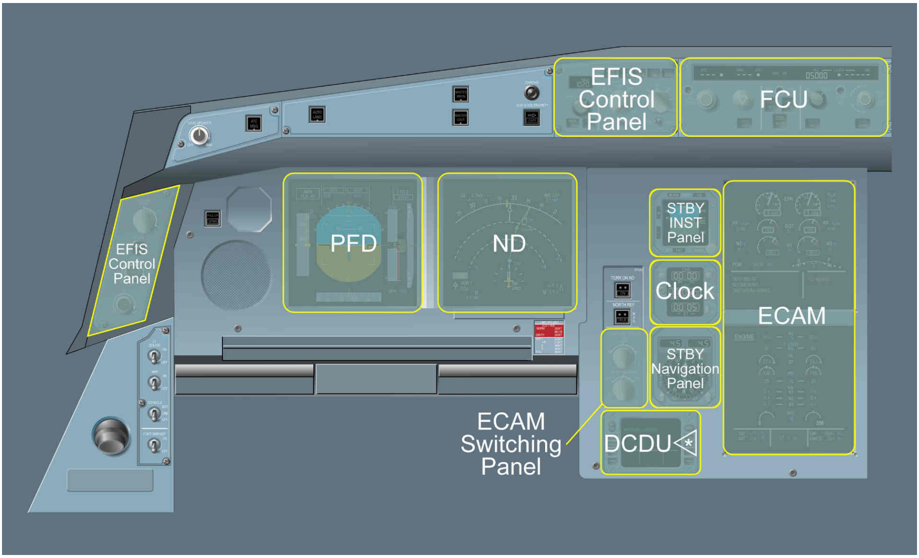
Ident.: DSC-25-10-30-00019041.0001001 / 20 MAR 17
Applicable to: ALL

The fourth occupant seat is a folding seat.


SHOULDER HARNESS CONTROL LEVER
NON-REMOVABLE HEADREST
SHOULDER HARNESS
LOCK
UNLOCK
BACKREST
BUCKLE
SEATING PANEL
LIFE VEST COMPARTMENT LOCK
LIFE-VEST
LIFE VEST STOWAGE

MAIN INSTRUMENT PANEL - CAPTAIN SIDE

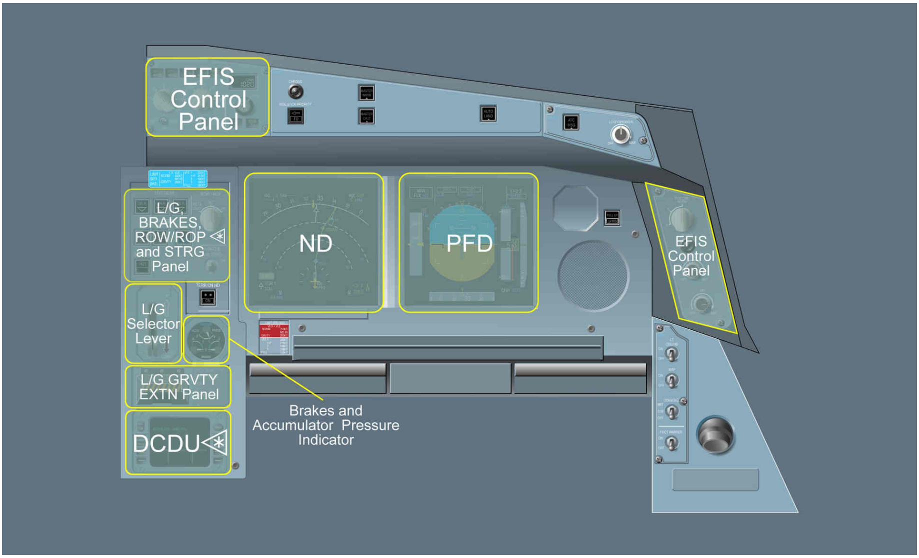
Ident.: DSC-25-10-40-00019117.0001001 / 21 MAR 17
Applicable to: ALL


EFIS Control Panel
FCU
EFIS Control Panel
PFD
ND
STBY INST Panel
Clock
ECAM
STBY Navigation Panel
ECAM Switching Panel
DCDU

MAIN INSTRUMENT PANEL - FIRST OFFICER SIDE

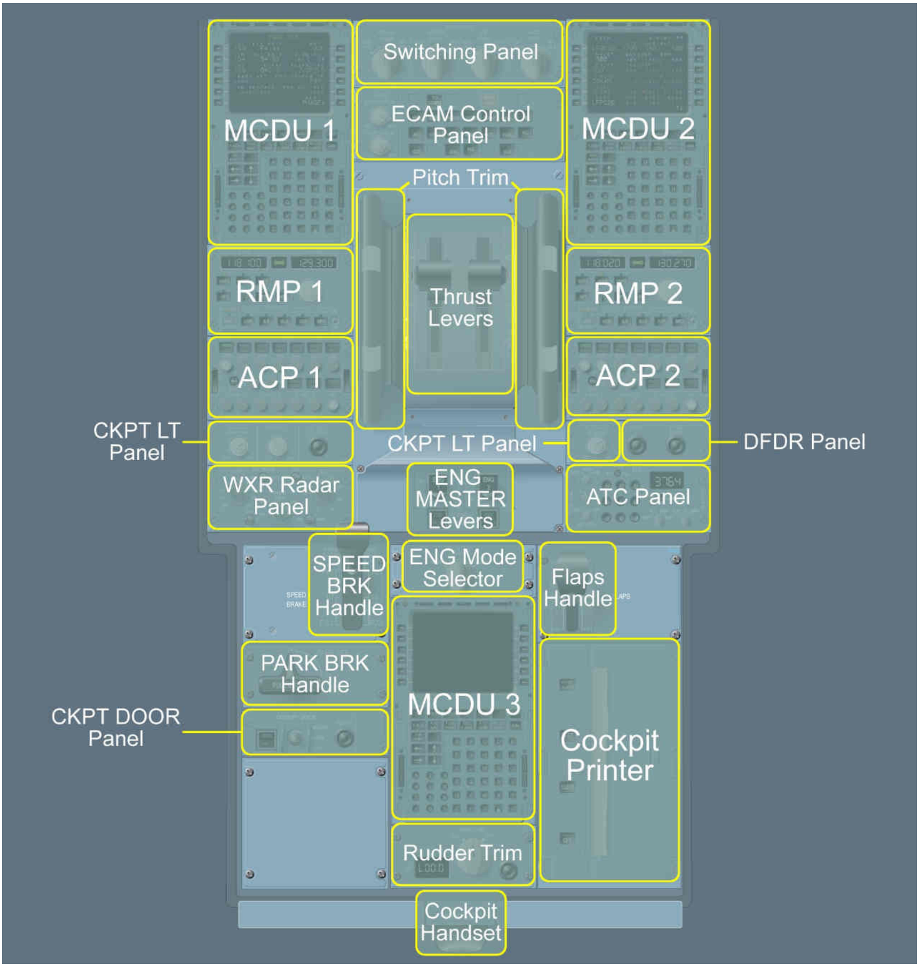
Ident.: DSC-25-10-40-00019143.0001001 / 03 SEP 19

Applicable to: ALL


EFIS Control Panel
L/G, BRAKES, ROW/ROP and STRG Panel
ND
PFD
EFIS Control Panel
L/G Selector Lever
L/G GRVTY EXTN Panel
DCDU
Brakes and Accumulator Pressure Indicator

PEDESTAL

Ident.: DSC-25-10-50-00019170.0001001 / 17 MAR 17
Applicable to: ALL


Switching Panel
MCDU 1
ECAM Control Panel
MCDU 2
Pitch Trim
Thrust Levers
RMP 1
RMP 2
ACP 1
ACP 2
CKPT LT Panel
CKPT LT Panel
DFDR Panel
WXR Radar Panel
ENG MASTER Levers
ATC Panel
SPEED BRK Handle
ENG Mode Selector
Flaps Handle
PARK BRK Handle
MCDU 3
Cockpit Printer
CKPT DOOR Panel
Rudder Trim
Cockpit Handset

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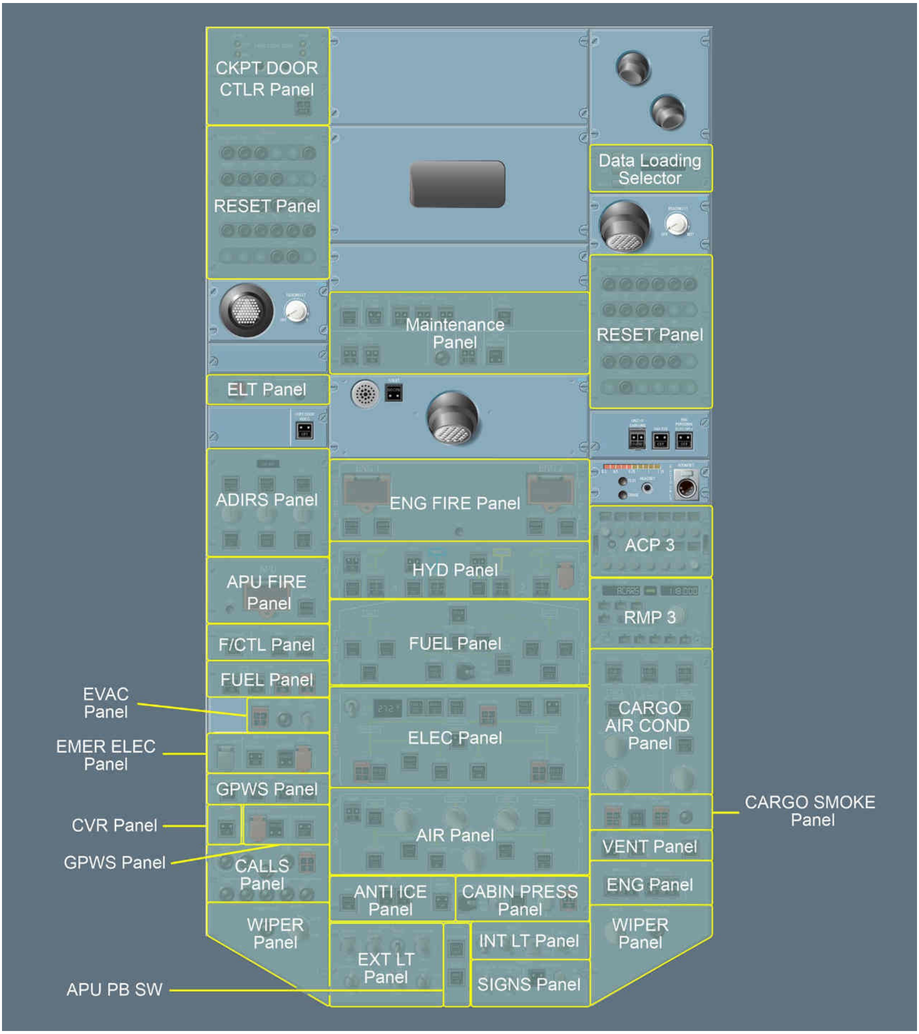
OVERHEAD PANEL

Ident.: DSC-25-10-60-00019193.0001001 / 17 MAR 17
Applicable to: ALL


CKPT DOOR CTLR Panel
Data Loading Selector
RESET Panel
Maintenance Panel
RESET Panel
ELT Panel
ADIRS Panel
ENG FIRE Panel
ACP 3
APU FIRE Panel
HYD Panel
RMP 3
F/CTL Panel
FUEL Panel
FUEL Panel
EVAC Panel
ELEC Panel
CARGO AIR COND Panel
EMER ELEC Panel
GPWS Panel
CARGO SMOKE Panel
CVR Panel
AIR Panel
VENT Panel
GPWS Panel
CALLS Panel
ANTI ICE Panel
CABIN PRESS Panel
ENG Panel
WIPER Panel
INT LT Panel
WIPER Panel
EXT LT Panel
SIGNS Panel
APU PB SW

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GENERAL

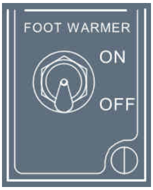
Ident.: DSC-25-10-70-00019209.0001001 / 20 MAR 17
Applicable to: ALL

The foot warmer system has a heating panel attached to each pedal. The temperature of the heating panels is about 20 °C (68 °F).

CONTROLS

Ident.: DSC-25-10-70-00019210.0001001 / 20 MAR 17
Applicable to: ALL

The Foot Warmer ON/OFF control switch is located on the main instrument panel, on the captain's and first officer's side.



FOOT WARMER SW

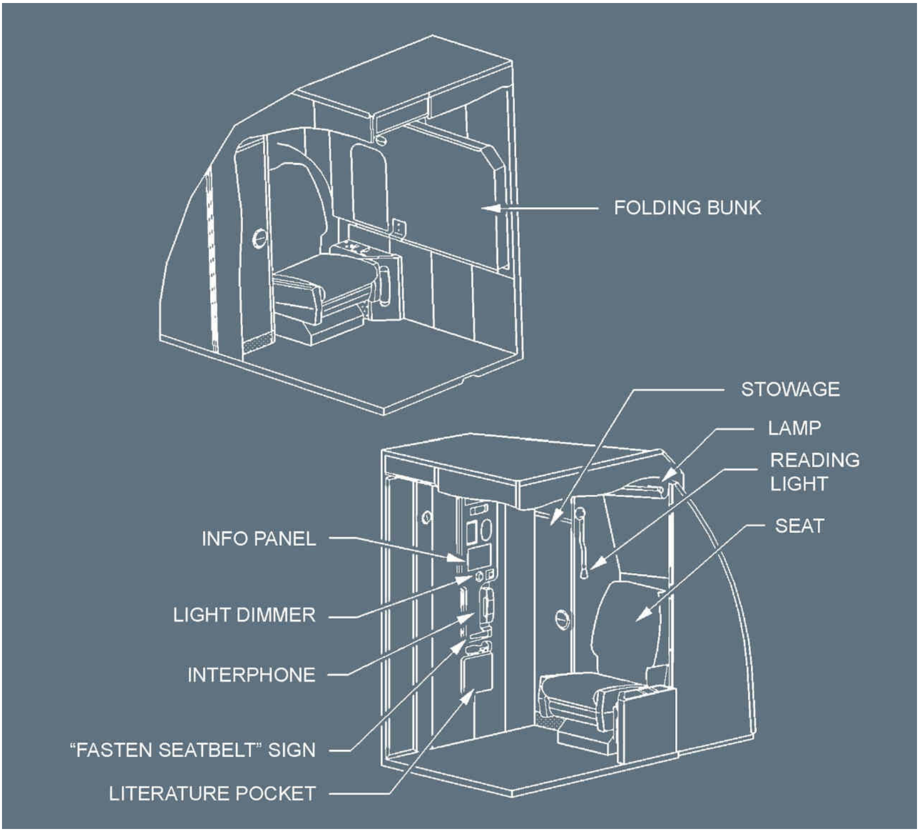
Operation of the associated heating panel on captain's pedals or first officer's pedals.

Intentionally left blank

GENERAL

Ident.: DSC-25-12-00019220.0010001 / 20 MAR 17
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

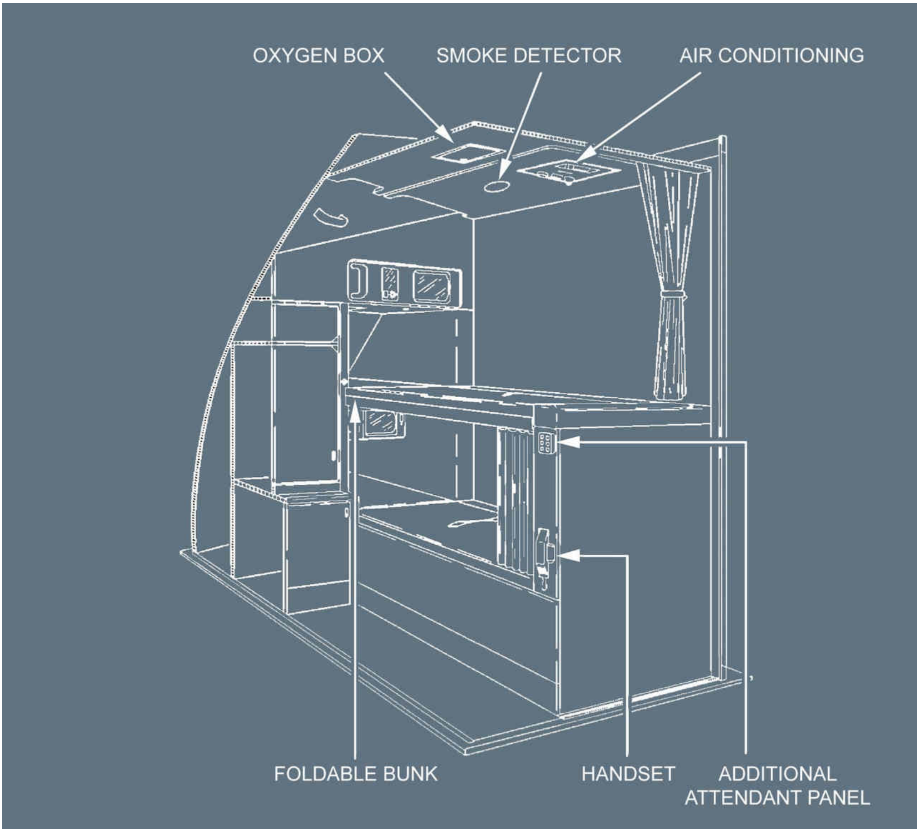
The Flight Crew Rest Compartment (FCRC) is a buyer-furnished equipment. This section describes the standard features of the FCRC (as it is stated in the Airbus standard interface specifications). For a description of the systems inside the compartment, refer to the supplier's documentation.
The FCRC is installed between the cockpit wall and the RH Door 1. The FCRC is a rest compartment with the capacity to accommodate one crew member during long haul flight. The FCRC has one separate seat and one folding bunk. Two optional flight crew seats can be installed instead of the folding bunk, and used during taxi, takeoff, and landing.


FOLDING BUNK
STOWAGE
LAMP
READING LIGHT
SEAT
INFO PANEL
LIGHT DIMMER
INTERPHONE
“FASTEN SEATBELT” SIGN
LITERATURE POCKET

GENERAL

Ident.: DSC-25-12-00019220.0001001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

The Flight Crew Rest Compartment (FCRC) is a buyer-furnished equipment, This section describes the standard features of the FCRC (as it is stated in the Airbus standard interface specifications). For a description of the systems inside the compartment, refer to the supplier's documentation.
The FCRC is installed between the cockpit wall and the RH Door 1. The FCRC is a rest compartment with the capacity to accommodate two crew members during long haul flight. The FCRC has two bunks. The upper bunk is foldable. The folded position of the upper bunk enables the occupant of the lower bunk to sit down.


OXYGEN BOX
SMOKE DETECTOR
AIR CONDITIONING
FOLDABLE BUNK
HANDSET
ADDITIONAL ATTENDANT PANEL

AIR CONDITIONING

Ident.: DSC-25-12-00019231.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The air supplied to the Flight Crew Rest Compartment (FCRC) is taken from the cabin's air supply. In addition, an independent electrical heating system in the Flight Crew Rest Compartment (FCRC) enables the crew to select the desired FCRC temperature.

COMMUNICATIONS

Ident.: DSC-25-12-00019232.0002001 / 03 OCT 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The FCRC is equipped with a cabin interphone handset, controlled via the CIDS, and a loudspeaker. It allows occupants to communicate with the cockpit, and with the cabin attendants. Passenger entertainment system ◁ is also available.

ELECTRICAL SYSTEM

Ident.: DSC-25-12-00000175.0001001 / 15 FEB 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AC and DC power is provided to the FCRC. A razor socket and PC power outlet are installed.

SMOKE DETECTION

Ident.: DSC-25-12-00019241.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

If smoke is detected, the smoke detection system triggers:
- The Master Warning light and a continuous repetitive chime (CRC) in the cockpit,
- A call light in the cabin, and
- A CRC in the compartment for 30 s, followed by a triple chime in the cabin every 30 s. (*Refer to DSC-26-57-10-10 Flight Crew Rest Compartment*).

LIGHTS

Ident.: DSC-25-12-00019242.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The CIDS controls the dimmable lights via an Additional Attendant Panel. Reading lights and No Smoking/Fasten Seatbelt signs are provided. Emergency lights are connected to the aircraft's emergency lighting system.

OXYGEN

Ident.: DSC-25-12-00019243.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

In case of cabin depressurization, masks are automatically released and can be used if the crew member is either sitting or lying down.

EMERGENCY EQUIPMENT

Ident.: DSC-25-12-00019245.0003001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Two life vests can be found under the FCRC's lower bunk.

DOOR

Ident.: DSC-25-12-00019246.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The entrance has a locking device and is designed to be unlocked from the outside in case of an emergency. The door must be open and secured during takeoff and landing.

GENERAL

Ident.: DSC-25-14-20-00019233.0004001 / 20 MAR 17
Applicable to: ALL

Since the crew rest compartment is buyer-furnished equipment, only the common features (as stated in the Airbus interface specifications), are described in this section. For a description of the systems inside the compartment, refer to the supplier documentation.
The Lower Deck Mobile Crew Rest (LDMCR) compartment is installed in the most forward section of the lower aft cargo compartment. It is accessible from the cabin via a staircase. Berths are provided to allow the crew to relax on long-range flights.
The LDMCR interfaces with the following aircraft systems:

DOORS

Ident.: DSC-25-14-20-00000749.0001001 / 15 FEB 11
Applicable to: ALL

For normal operation, the LDMCR is accessible through the staircase door and a hatch in the cabin floor. The LDMCR is equipped with an additional emergency hatch to evacuate directly into the cabin.

AIR CONDITIONING

Ident.: DSC-25-14-20-00019248.0003001 / 20 MAR 17
Applicable to: ALL

The air supplied to the LDMCR is a mixture of fresh and recirculated air, taken from the cabin air supply. An air supply isolation valve is installed in the supply duct, that is controlled by the ventilation controller. The valve is closed, when the access hatch is not fully open, or smoke is detected in the LDMCR or aft/bulk cargo compartment.

Note: *Pressing the TEST pushbutton on the CARGO SMOKE panel, or performing the LDMCR internal smoke detection system test, closes the air supply isolation valve.*

An independent electrical heating system is installed in the LDMCR. Temperature control inside the LDMCR allows the selection of a temperature within the range of +20 °C to +25 °C. The heating only operates in flight.

Note: *The LDMCR heating system is lost in case of LGCIU2 or GEN 2 failure.*

COMMUNICATION

Ident.: DSC-25-14-20-00019249.0003001 / 20 MAR 17
Applicable to: ALL

The LDMCR is equipped with an interphone station, an attendant indication panel and additional attendant panels. Passenger address and audio entertainment systems are available.

ELECTRICAL SYSTEM

Ident.: DSC-25-14-20-00019250.0003001 / 20 MAR 17
Applicable to: ALL

AC and DC power is provided to the LDMCR.

SMOKE DETECTION

Ident.: DSC-25-14-20-00017063.0003001 / 21 MAR 17
Applicable to: ALL

Refer to DSC-26-57-10-10 Lower Deck Mobile Crew Rest Compartment.

FIRE PROTECTION

Ident.: DSC-25-14-20-00017084.0003001 / 26 NOV 19
Applicable to: ALL

Refer to DSC-26-57-10-20 Lower Deck Mobile Crew Rest Compartment
The LDMCR is equipped with two portable fire extinguishers ◁ .

LIGHTS

Ident.: DSC-25-14-20-00017085.0003001 / 21 AUG 15
Applicable to: ALL

General illumination is installed. The CIDS controls the general illumination via the two Additional Attendant Panels (AAP). An independent continuous staircase illumination is also installed. Reading lights and No Smoking/Fasten Seat Belt signs are provided. The aircraft emergency lighting system controls and supplies the emergency lights and emergency exit sign, installed in the LDMCR.

OXYGEN

Ident.: DSC-25-14-20-00017086.0003001 / 21 AUG 15
Applicable to: ALL

Chemical oxygen generators are provided in the LDMCR. The aircraft system releases the masks.

NORMAL OPERATIONS

Ident.: DSC-25-14-20-00000754.0001001 / 15 FEB 11
Applicable to: ALL

During taxi, takeoff, and landing the LDMCR must be unoccupied. In flight, if the LDMCR is occupied, the access hatch must stay fully open to ensure that the air supply isolation valve is open.

ABNORMAL OPERATION

Ident.: DSC-25-14-20-00000756.0001001 / 21 AUG 15
Applicable to: ALL

PRESSURE LOSS

In case of pressure loss a high-low chime alerts the occupants for 30 s and the oxygen masks drop down.

LOW AIR FLOW

If insufficient air flow can be provided to the LDMCR, an internal buzzer (minimum 30 s) alerts the occupants to evacuate. The heating system is automatically turned off.

Note: *Pressing the TEST pushbutton on the CARGO SMOKE panel closes the air supply isolation valve that triggers the LOW AIR FLOW warning in the LDMCR.*

LDMCR ISOLATION VALVE FAILURE

If the LDMCR isolation valve is not closed, but both hatches are closed, the “DO NOT OPEN HATCH” sign comes on in the staircase.
If the air supply isolation valve fails in the open position, or if it does not close when commanded, the ECAM caution “COND CRG REST ISOL FAULT” is triggered.

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GENERAL

Ident.: DSC-25-20-10-00015512.0001001 / 05 JUN 18
Applicable to: ALL

The following table provides the list of controls dedicated to Pax Entertainment & Connectivity Systems.
For each pb-sw / sw that is set to OFF, the table provides the associated equipments (functions) that are cut-off.

P/B	EQUIPMENTS (FUNCTIONS)	DESCRIPTIONS
IFEC	IFE	*Refer to DSC-25-20-40 General*
NO PED	Signs	*Refer to DSC-33-40-10 Overhead Panel*
PASSENGER INFORMATION	Airshow, telephony	*Refer to DSC-25-20-50-20 PASSENGER INFORMATION pb-sw (If Installed)*
PAX BBAND	Mobile, Wifi (Elec)	*Refer to DSC-26-59-10 Smoke Detection*
PAX COM	Mobile, Wifi (Elec)	*Refer to DSC-25-20-50-20 PAX COM pb-sw (If Installed)*
PAX INTERNET	Mobile, Wifi (Elec)	*Refer to DSC-25-20-50-20 PAX INTERNET pb-sw (If Installed)*
PAX PERSONAL ELEC SUPPLY	Mobile, Wifi, Supply	*Refer to DSC-25-20-20-20 PAX PERSONAL ELEC SPLY pb-sw (If Installed)*
PAX SYS	Mobile, Wifi, IFE, Seat actuators, PED	*Refer to DSC-26-56-20 Cabin System Panel*
PORTABLE EQPT & WIRELESS	Mobile, Wifi (Function)	*Refer to DSC-25-20-50-20 PORTABLE EQPT & WIRELESS pb-sw (If Installed)*
VCC	IFE Video Part	*Refer to DSC-25-20-30 General*

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General

GENERAL

Ident.: DSC-25-20-20-10-00015513.0001001 / 05 JAN 15
Applicable to: ALL

The In-Seat Power Supply System (ISPSS) provides electrical power to the In-Seat Power Supply Unit (ISPSU) outlets, located in the passenger seats, and enables the use of Portable Electronic Devices ◁ (PED).
It is possible to simultaneously disconnect power from all ISPSUs via a single switch ◁ located in the cockpit or a pushbutton ◁ located in the forward cabin (FAP or VCC).

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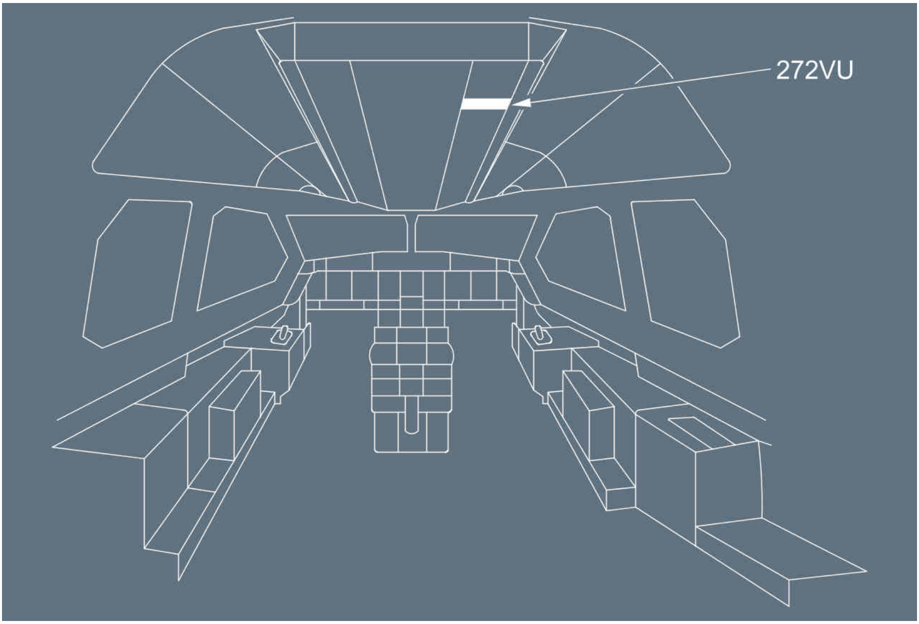
Controls and Indicators

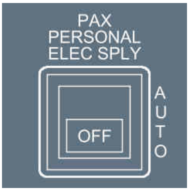
PAX PERSONAL ELEC SPLY PB-SW

Ident.: DSC-25-20-20-20-00015514.0001001 / 21 MAR 17
Applicable to: ALL



The pushbutton-switch described here below is installed on the 272 VU panel on the overhead panel.

Note: *The ISPSU is controlled by the PAX PERSONAL ELEC SPLY pb-sw or by the PAX SYS pb-sw (for description of PAX SYS pb-sw,* Refer to DSC-26-56-20 Cabin System Panel*).*



AUTO : Powers all ISPSUs.

Note:
- *In case of rapid decompression, the system is automatically disconnected.*
- *In case of slat extensions (during landing or takeoff) the system can automatically deactivates all PED outlets ◁ .*

OFF : The following equipments are cut-off:
- ISPSU,
- Seat actuators,
- PED ◁ .

GENERAL

Ident.: DSC-25-20-30-00015522.0001001 / 21 MAR 17
Applicable to: ALL

The Video Control Center (VCC) ◁ delivers the audio and video features of the IFE.
For description of VCC pb-sw ◁ , *Refer to DSC-26-56-20 Cabin System Panel*.

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GENERAL

Ident.: DSC-25-20-40-00015586.0001001 / 21 MAR 17
Applicable to: ALL

The In-Flight Entertainment Center (IFEC) delivers entertainment features such as: music, video, and games.
For description of IFEC pb-sw , *Refer to DSC-26-56-20 Cabin System Panel*.

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Introduction

INTRODUCTION

Ident.: DSC-25-20-50-10-00015711.0001001 / 05 JAN 15
Applicable to: ALL

The Cabin Connectivity System provides a connection to the World Wide Web for passengers and connected cabin systems. The passengers can access the Internet wireless or, optionally, by wire.
In addition, the Cabin Connectivity System provides, optionally, telephone connection to passengers.

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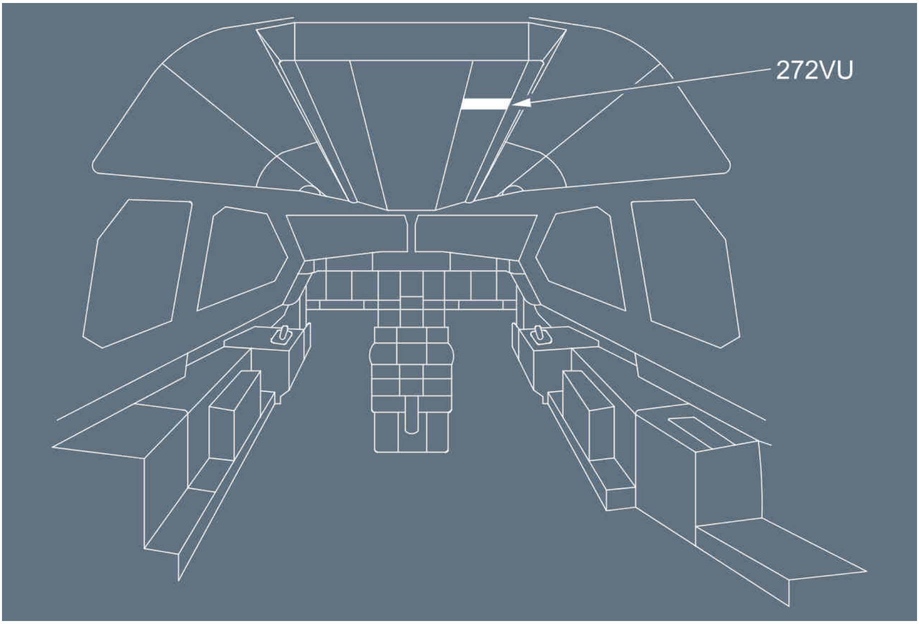
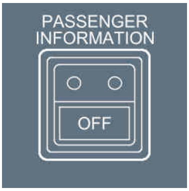
Controls and Indicators

PASSENGER INFORMATION PB-SW ⩤

Ident.: DSC-25-20-50-20-00015589.0001001 / 05 JAN 15
Applicable to: ALL



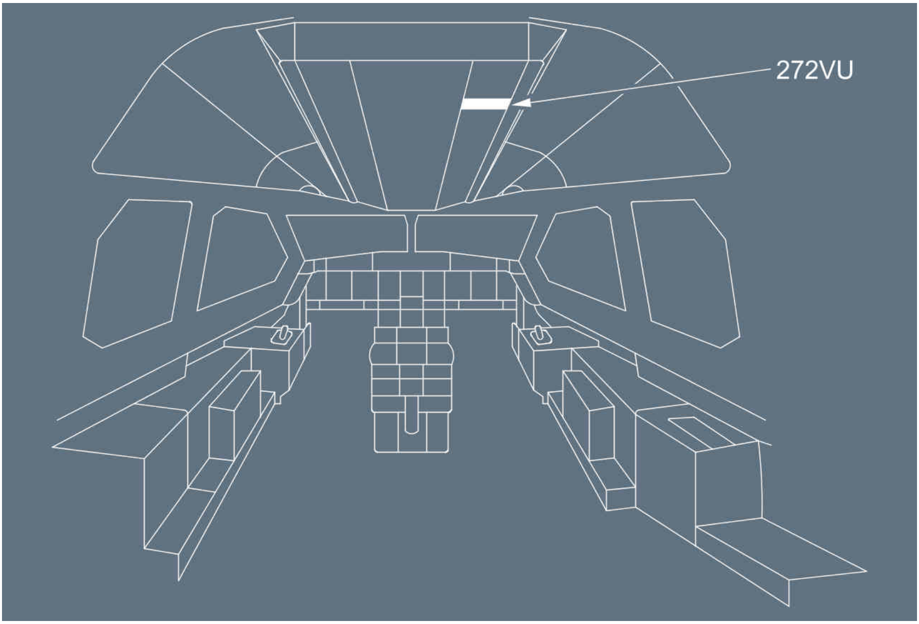
The pushbutton-switch described here below is installed on the 272 VU panel on the overhead panel.



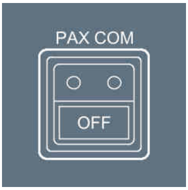
OFF : The Airshow and the Air-to-ground telephone are cut-off. When the pushbutton-switch is released, the OFF light comes on in white.

PAX COM PB-SW

Ident.: DSC-25-20-50-20-00015588.0001001 / 05 JAN 15
Applicable to: ALL



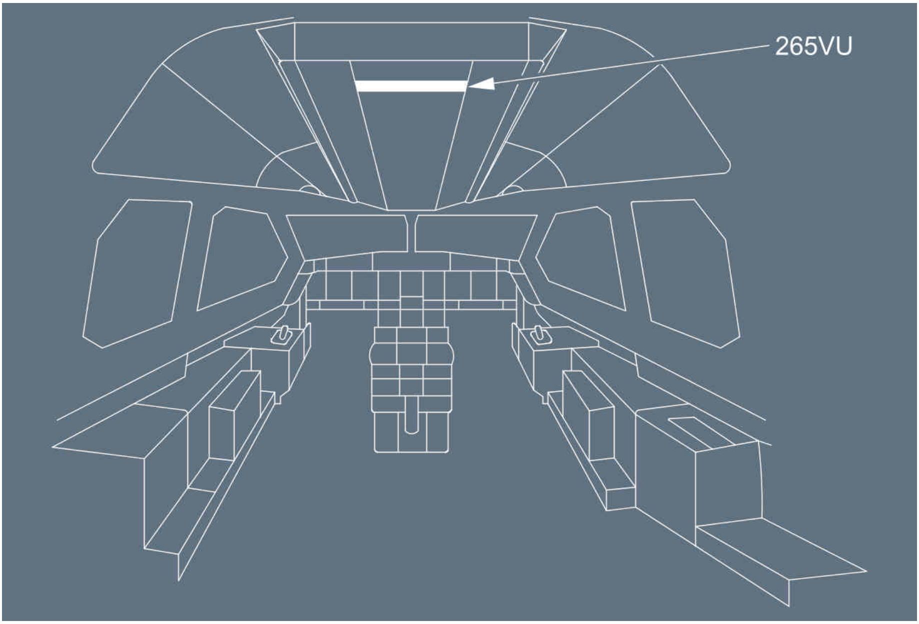
The pushbutton-switch described here below is installed on the 272 VU panel on the overhead panel.



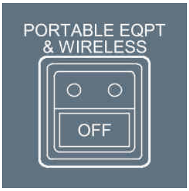
OFF : The Cabin Connectivity system is cut-off. When the pushbutton-switch is released, the OFF light comes on in white.

PORTABLE EQPT & WIRELESS PB-SW ◁

Ident.: DSC-25-20-50-20-00015712.0001001 / 05 JAN 15
Applicable to: ALL



The pushbutton-switch here below is installed on the 265 VU panel on the overhead panel.



The flight crew can disable the Cabin Connectivity System (Internet and Mobile telephony) by using the PORTABLE EQPT & WIRELESS pb-sw ◁ .

OFF : When pressed, it inhibits the Cabin Connectivity System.

Note: *Depending on aircraft customization, the ECAM displays GSM < 4 MN, meaning that the disconnection could take up to 4 min.*

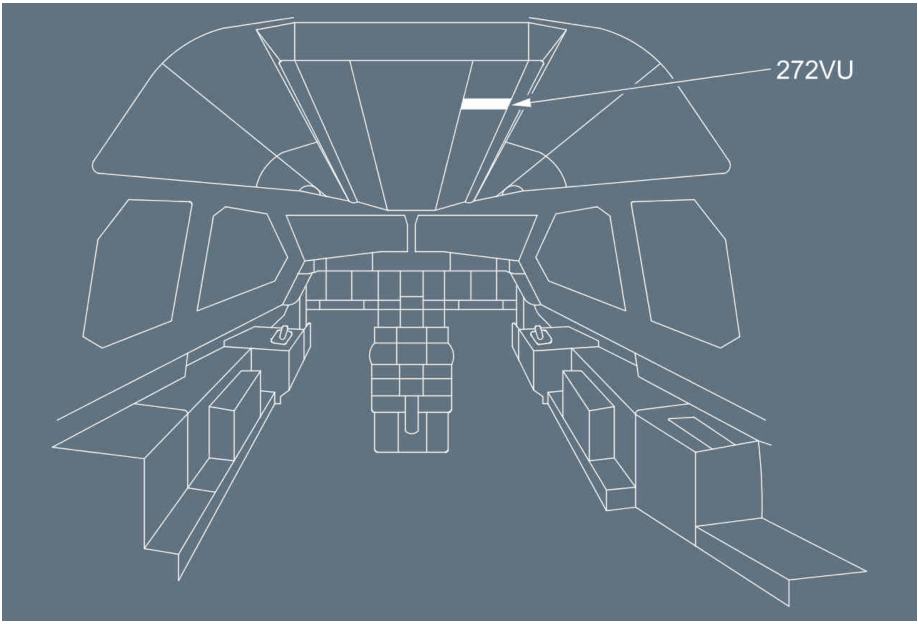
ON : When pressed again, it activates the Cabin Connectivity System.

Note: During the takeoff roll and the landing roll, the connection is automatically inhibited.

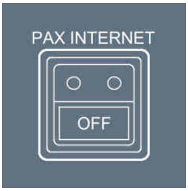
PAX INTERNET PB-SW ◁

Ident.: DSC-25-20-50-20-00022152.0001001 / 05 JUN 18

Applicable to: ALL



The pushbutton-switch described here below is installed on the 272 VU panel on the overhead panel.



OFF :	The Cabin Connectivity system is cut-off. When the pushbutton-switch is released, the OFF light comes on in white.

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OVERVIEW

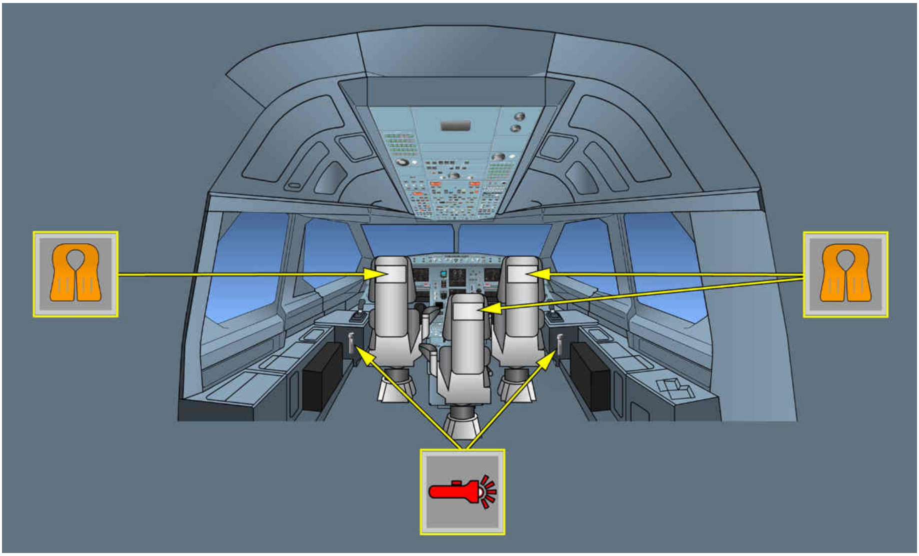
Ident.: DSC-25-30-00021875.0001001 / 04 DEC 17
Applicable to: ALL

Placards indicate the location of emergency equipment on board the aircraft. To consult the list of symbols, *Refer to CCOM/11-010 Symbol List*.

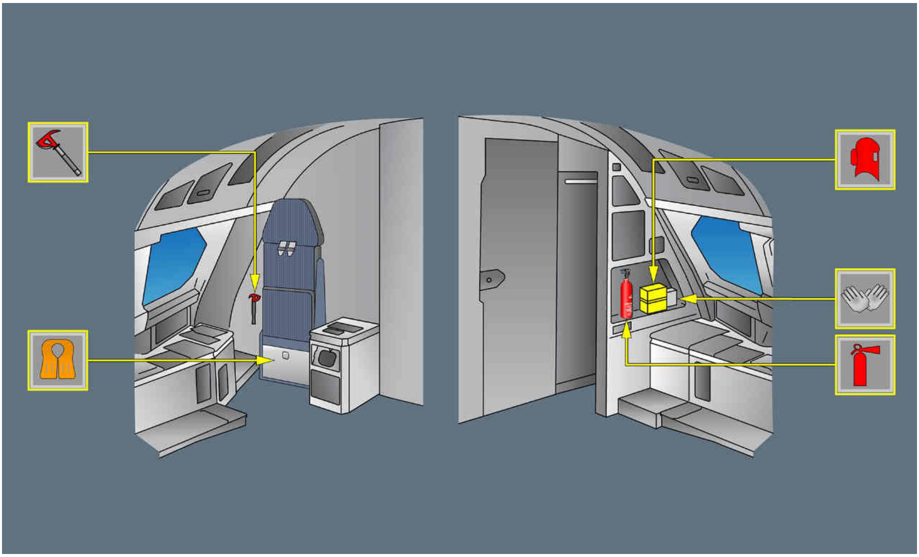
COCKPIT EMERGENCY EQUIPMENT

Ident.: DSC-25-30-00021876.0001001 / 04 DEC 18
Applicable to: ALL

Cockpit Front View



Cockpit Rear View



Note: The illustration shows the typical emergency equipment in this area. The location and the type of emergency equipment may vary. Placards indicate the location and the type.

CABIN EMERGENCY EQUIPMENT

Ident.: DSC-25-30-00021877.0001001 / 04 DEC 17
Applicable to: ALL

For the description of the cabin emergency equipment, Refer to CCOM/EMERGENCY EQUIPMENT/PORTABLE EMERGENCY EQUIPMENT.

AIRCRAFT SYSTEMS

FIRE PROTECTION

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DSC-26-10 General

Description...A

DSC-26-20 Engine and APU

DSC-26-20-10 System Description

Fire Detection...A
Fire Extinguishing...B
Fire Detection and Detection Fault Logic...C

DSC-26-20-20 Controls and Indicators

ENG FIRE Panel...A
APU FIRE Panel...B
ENG MASTER Panel...C
External Power Panel...D
Maintenance Panel...E

DSC-26-30 Avionics Bay

DSC-26-30-10 System Description

Smoke Detection...A

DSC-26-30-20 Controls and Indicators

VENTILATION Panel...A

DSC-26-40 Lavatory

DSC-26-40-10 System Description

Smoke Detection...A
Waste Bin Fire Extinguishing...B

DSC-26-50 Cargo Compartments

DSC-26-50-10 System Description

Smoke Detection...A
Fire Extinguishing...B

DSC-26-50-20 Controls and Indicators

CARGO SMOKE Panel...A

DSC-26-56 VCC/IFEC Smoke Detection

DSC-26-56-10 System Description

Smoke Detection...A

Continued on the following page

Continued from the previous page

DSC-26-56-20 Controls and Indicators

Cabin System Panel.......A

DSC-26-57 Crew Rest Compartments

DSC-26-57-10 System Description

DSC-26-57-10-10 Smoke Detection

Lower Deck Mobile Crew Rest Compartment.......A
Staircase Housing.......B
Flight Crew Rest Compartment.......C

DSC-26-57-10-20 Fire Extinguishing

Lower Deck Mobile Crew Rest Compartment.......A

DSC-26-59 Broadband System

DSC-26-59-10 System Description

Smoke Detection.......A

DSC-26-59-20 Controls and Indicators

Cabin System Panel.......A

DESCRIPTION

Ident.: DSC-26-10-00000376.0001001 / 27 JAN 11
Applicable to: ALL

Aircraft Fire Protection Systems Include:

- Fire and overheat detection and extinguishing systems for the:
  - Engines
  - APU
- Smoke detection and extinguishing for the:
  - Cargo compartments
  - Lavatories
- Smoke detection for the:
  - Avionic bay
- Portable fire extinguishers for the:
  - Flight compartment
  - Passenger cabin

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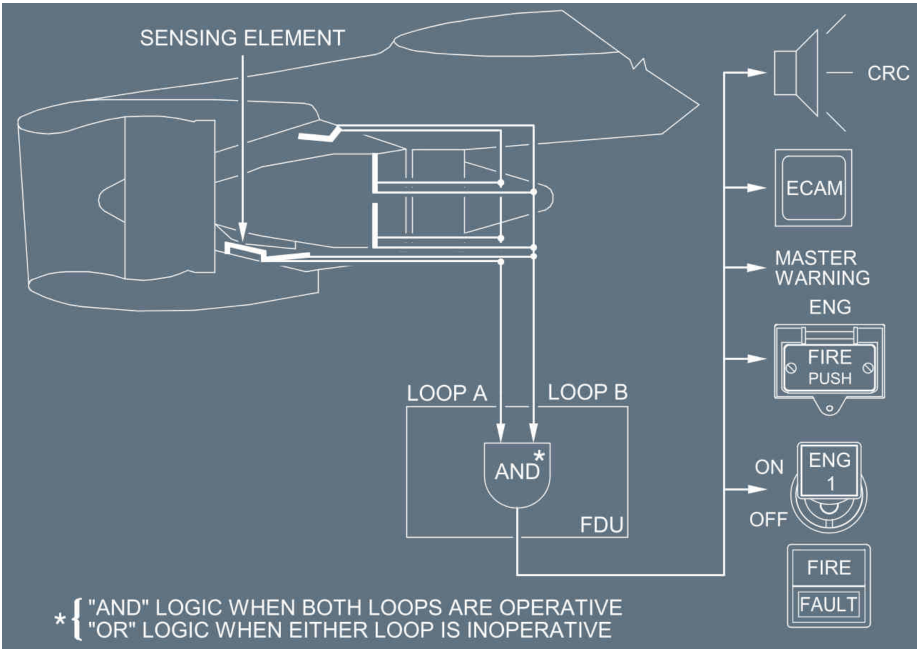
FIRE DETECTION

Ident.: DSC-26-20-10-00000381.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The engines and the APU each have a fire and overheat detection system consisting of :
- Two identical gas detection loops (A and B) mounted in parallel.
- A Fire Detection Unit (FDU).

The gas detection loops consist of :
- Four sensing elements for each engine, located in the pylon nacelle, in the engine core (gearbox and turbine) sections.
- One sensing element in the APU compartment.

When a sensing element is subjected to heat, it sends a signal to the fire detection unit.
As soon as loops A and B detect temperature at a preset level, it triggers the fire warning system.
A fault in one loop (break or loss of electrical supply) does not affect the warning system. The unaffected loop still protects the aircraft.
If the system detects an APU fire while the aircraft is on the ground, it shuts down the APU automatically and discharges extinguishing agent.


SENSING ELEMENT
CRC
ECAM
MASTER WARNING
ENG
FIRE
PUSH
LOOP A
LOOP B
AND*
FDU
ON
ENG
1
OFF
FIRE
FAULT
* { "AND" LOGIC WHEN BOTH LOOPS ARE OPERATIVE
"OR" LOGIC WHEN EITHER LOOP IS INOPERATIVE

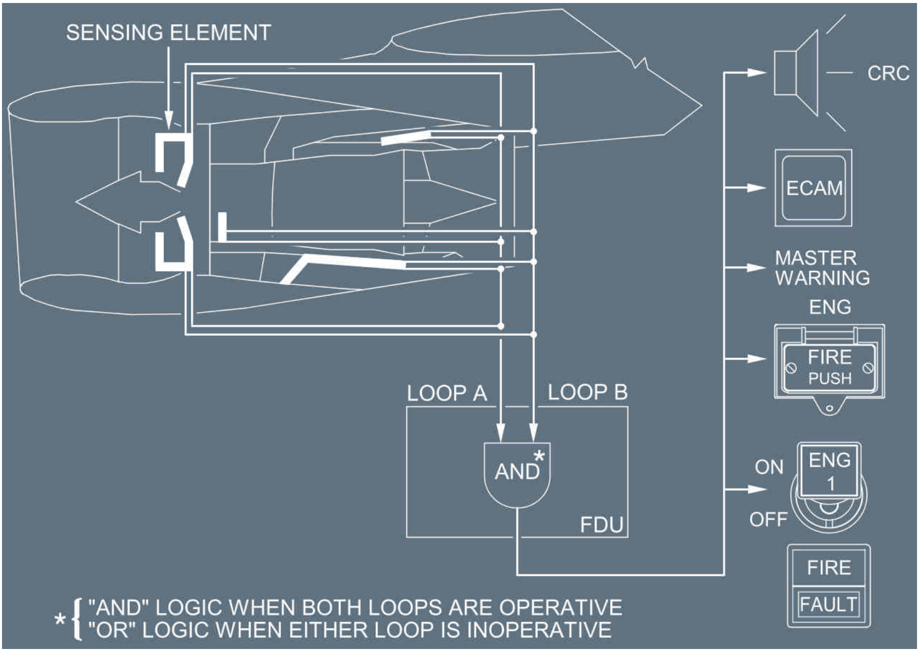
FIRE DETECTION

Ident.: DSC-26-20-10-00000381.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The engines and the APU each have a fire and overheat detection system consisting of :
- Two identical gas detection loops (A and B) mounted in parallel.
- A Fire Detection Unit (FDU).

The gas detection loops consist of :
- Five sensing elements for each engine, located in the pylon nacelle, in the engine core, compressor and fan sections.
- One sensing element in the APU compartment.

When a sensing element is subjected to heat, it sends a signal to the fire detection unit.
As soon as loops A and B detect temperature at a preset level, it triggers the fire warning system.
A fault in one loop (break or loss of electrical supply) does not affect the warning system. The unaffected loop still protects the aircraft.
If the system detects an APU fire while the aircraft is on the ground, it shuts down the APU automatically and discharges extinguishing agent.


SENSING ELEMENT
CRC
ECAM
MASTER WARNING
ENG
FIRE PUSH
LOOP A
LOOP B
AND*
FDU
ON
OFF
ENG 1
FIRE
FAULT
* { "AND" LOGIC WHEN BOTH LOOPS ARE OPERATIVE
"OR" LOGIC WHEN EITHER LOOP IS INOPERATIVE

FIRE EXTINGUISHING

Ident.: DSC-26-20-10-00021202.0001001 / 17 MAR 17
Applicable to: ALL

ENGINES

Each engine has two extinguisher bottles equipped with electrically-operated squibs to discharge their agents. Each squib has a dual electric supply. The flight crew controls the discharge of the extinguisher bottles from the ENG FIRE panel in the cockpit.

APU

The APU has one fire extinguisher bottle that has two electrically-operated squibs to discharge its agent.
The flight crew controls the discharge from the APU FIRE panel in the cockpit.
When an APU fire is detected on the ground, the APU automatically shuts down, and the extinguisher bottle discharges automatically.

FIRE DETECTION AND DETECTION FAULT LOGIC

Ident.: DSC-26-20-10-00021201.0001001 / 17 MAR 17
Applicable to: ALL

Fire detection units process all the warnings and cautions originating in the sensing elements:

- A fire warning appears if:
  - Both loop A and B send a fire signal, or
  - One loop sends a fire signal and the other one is failed, or
  - Breaks occur in both loops within 5 s of each other (flame effect), or
  - A test is performed on the associated FIRE panel
- A loop-fault caution appears if:
  - One loop is failed, or
  - Both loops are failed, or
  - The FDU fails.

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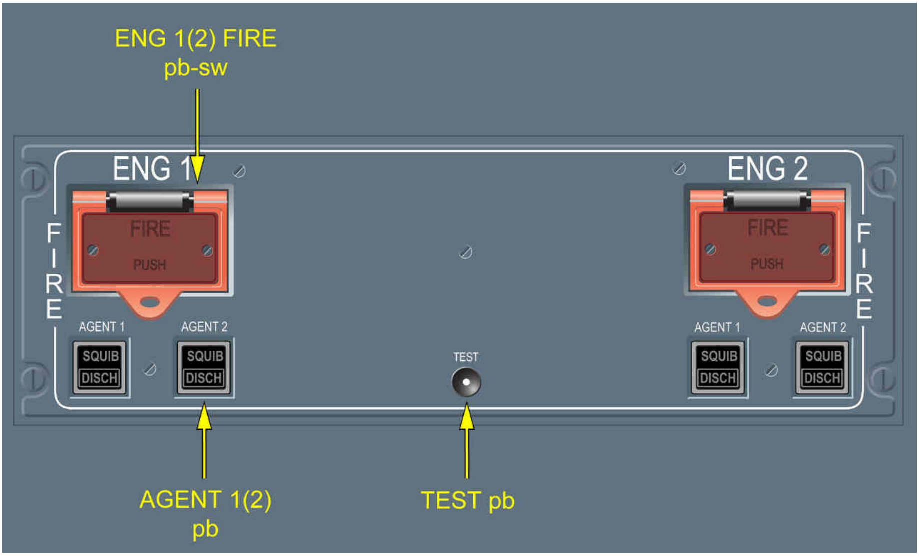
ENG FIRE PANEL

Applicable to: ALL

Ident.: DSC-26-20-20-10-00021185.0001001 / 05 MAY 22


ENG 1(2) FIRE
pb-sw
ENG 1
ENG 2
FIRE
PUSH
FIRE
PUSH
FIRE
FIRE
AGENT 1
AGENT 2
AGENT 1
AGENT 2
SQUIB
DISCH
TEST
AGENT 1(2)
pb
TEST pb

Ident.: DSC-26-20-20-10-00021186.0001001 / 10 MAY 22

ENG FIRE PB-SW

The PB-SW normal position is in, and guarded. When the flight crew pushes it, the PB-SW is released and sends an electrical signal that performs the following for the corresponding engine:

- Silences the aural fire warning
- Arms the fire extinguisher squibs
- Closes the low-pressure fuel valve
- Closes the hydraulic fire shut off valve
- Closes the engine bleed valve
- Closes the pack flow control valve
- Cuts off the FADEC power supply
- Deactivates the IDG.

The red lights come on, regardless of the PB-SW position, whenever the fire warning of the corresponding engine is activated.

Ident.: DSC-26-20-20-10-00021187.0001001 / 10 MAY 22

AGENT 1(2) PB

Both AGENT pbs of an affected engine become active when the flight crew releases the ENG FIRE pb-sw.
A brief push on the PB discharges the corresponding fire agent.

- "SQUIB" comes on white when the flight crew releases the associated ENG FIRE pb-sw to help the flight crew identify the AGENT pb to be activated
- "DISCH" comes on amber when the corresponding fire extinguisher bottle has lost pressure.

Ident.: DSC-26-20-20-10-00021188.0001001 / 10 MAY 22

TEST PB

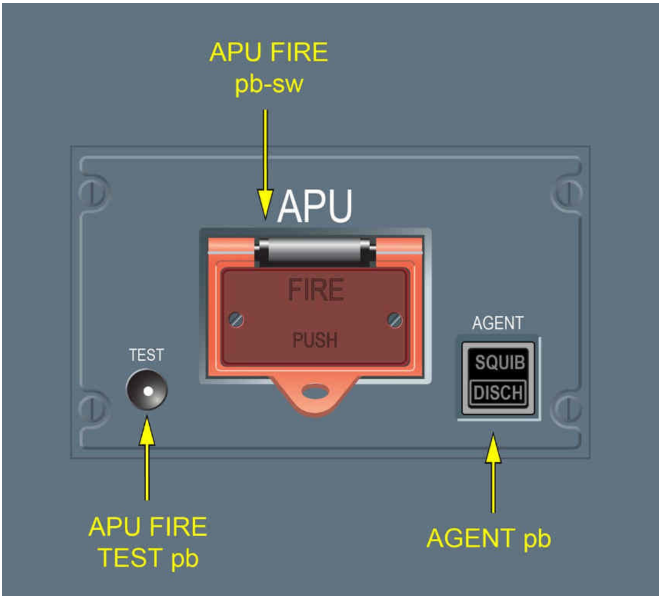
This PB tests the operation of the fire detection and extinguishing system for the engines.

When pressed:
- A CRC sounds
- The MASTER WARNING lights flash
- The ENG FIRE warning appears on ECAM
- On the ENG FIRE panel:
  - The ENG FIRE pb-sws light up red
  - The SQUIB lights come on white if discharge supplies are available
  - The DISCH lights come on amber
- On the ENG MASTER panel (pedestal):
  - The FIRE lights come on red.

APU FIRE PANEL

Applicable to: ALL

Ident.: DSC-26-20-20-20-00021189.0001001 / 05 MAY 22



Ident.: DSC-26-20-20-20-00021190.0001001 / 10 MAY 22

APU FIRE PB-SW

The PB-SW normal position is in, and guarded. When the flight crew pushes it, the PB-SW is released and sends an electrical signal that performs the following for the APU:

- Shuts down the APU
- Silences the aural warning
- Arms the squib on the APU fire extinguisher
- Closes the low-pressure fuel valve
- Shuts off the APU fuel pump
- Closes the APU bleed valve and X bleed valve and deactivates the APU generator.

The red lights come on, regardless of the PB-SW position, whenever an APU fire warning is activated.

Ident.: DSC-26-20-20-20-00021191.0001001 / 10 MAY 22

AGENT PB

The APU AGENT pb becomes active when the flight crew releases the APU FIRE pb-sw.
A brief push on the PB discharges the corresponding fire agent.

- "SQUIB" comes on white when the flight crew releases the APU FIRE pb-sw
- "DISCH" comes on amber when the fire extinguisher bottle has lost pressure.

Note: *A red disk, which is outside at the rear of the fuselage, signals that the agent is not discharged overboard due to bottle overpressure.*

Ident.: DSC-26-20-20-20-00021192.0001001 / 10 MAY 22

APU FIRE TEST PB

This PB tests the operation of the APU fire detection and extinguishing system.

When pressed:
- A CRC sounds
- The MASTER WARN light flash
- The APU FIRE warning appears on ECAM.
- On the FIRE panel:
  - The APU FIRE pb-sw lights up red
  - The SQUIB light comes on white if discharge supplies are available
  - The DISCH light comes on amber.

Note: *The automatic shutdown of the APU on ground may occur if the flight crew performs this test for more than 3 seconds.*

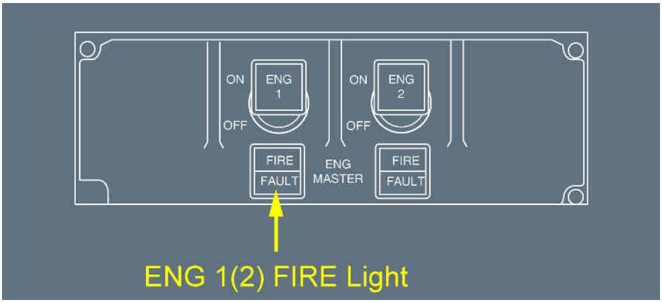
Note: *If the fire test is performed on ground with only batteries to supply the electrical network, both of the following apply:*

- *The SQUIB light and DISCH light come on, without ECAM warnings*
- *The red APU FIRE pb-sw light partially comes on, as one of the sets of bulbs is not electrically available.*

ENG MASTER PANEL

Applicable to: ALL

Ident.: DSC-26-20-20-30-00021193.0001001 / 17 MAR 17


ON
ENG
1
OFF
ON
ENG
2
OFF
FIRE
FAULT
ENG
MASTER
FIRE
FAULT
ENG 1(2) FIRE Light

Ident.: DSC-26-20-20-30-00021194.0001001 / 17 MAR 17

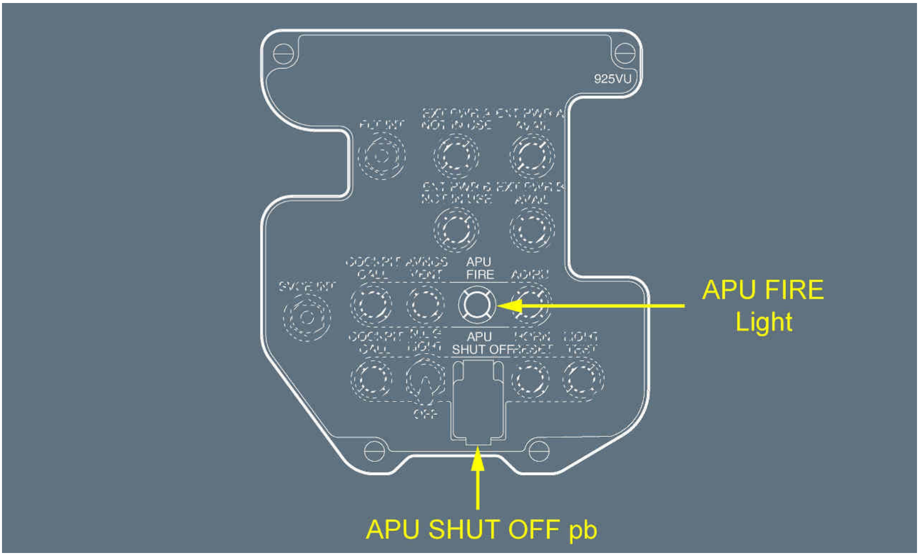
ENG FIRE LIGHT

This light identifies the engine to be shutdown in the case of fire.
The light comes on red when an engine fire warning is triggered.

EXTERNAL POWER PANEL

Applicable to: ALL

Ident.: DSC-26-20-20-40-00021195.0001001 / 17 MAR 17


925VU
FLT INT
EXT PWR A NOT IN USE
EXT PWR A AVAIL
EXT PWR B NOT IN USE
EXT PWR B AVAIL
SVCE INT
COCKPIT CALL
AVNCS VENT
APU FIRE
ADIRU
COCKPIT CALL
NLG LIGHT
APU SHUT OFF
HORN RESET
LIGHT TEST
OFF
APU FIRE Light
APU SHUT OFF pb

Ident.: DSC-26-20-20-40-00021196.0001001 / 17 MAR 17

APU FIRE LIGHT

The red APU FIRE light comes on and an external warning horn sounds when the system detects an APU fire.
The APU fire extinguisher discharges automatically 3 s after the appearance of the fire warning.
The light goes out when the fire has been extinguished.

Ident.: DSC-26-20-20-40-00021197.0001001 / 17 MAR 17

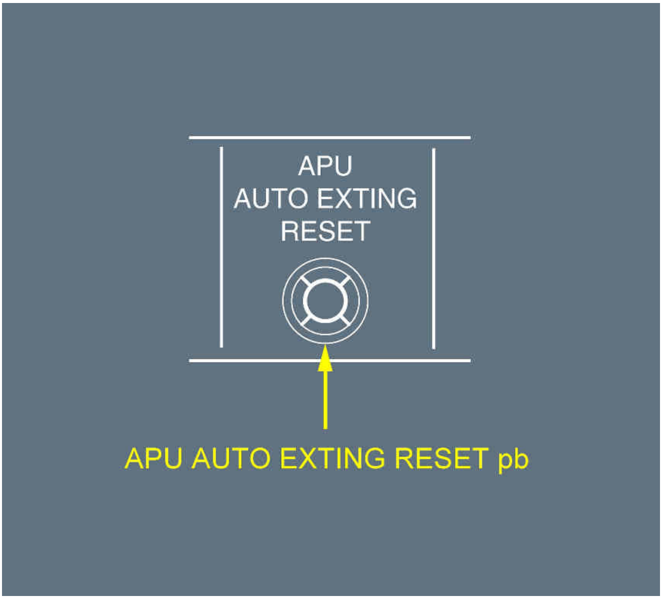
APU SHUT OFF PB

This pushbutton is guarded.
When there is an APU fire and this button is pressed, it confirms that the APU has shut down automatically and silences the external warning horn.

MAINTENANCE PANEL

Applicable to: ALL

Ident.: DSC-26-20-20-50-00021198.0001001 / 17 MAR 17



Ident.: DSC-26-20-20-50-00021199.0001001 / 17 MAR 17

APU AUTO EXTING RESET PB

Pressing this button resets the automatic shutdown function.
During the test or if the fire signal is active, the reset is inoperative.

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SMOKE DETECTION

Ident.: DSC-26-30-10-00021204.0001001 / 17 MAR 17
Applicable to: ALL

The smoke detection system of the avionics bay consists of:

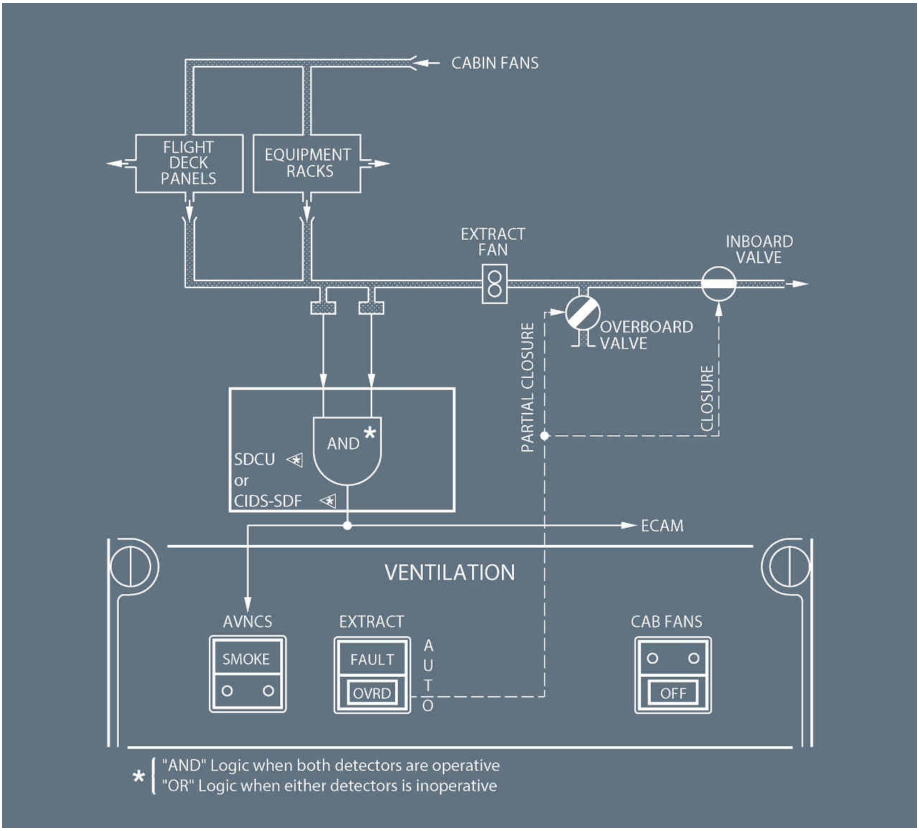
- Two smoke detectors, in the air extraction duct of the avionics ventilation system
- A Smoke Detection Control Unit (SDCU) ◁ or a Cabin Intercommunication Data System (CIDS) with a Smoke Detection Function (SDF) ◁ , that receives signals from the smoke detectors, and transmits them to the ECAM.

The avionics smoke warning triggers, if:

- Both smoke detectors detect smoke for more than 5 s, or
- One smoke detector detects smoke for more than 5 s, and the other smoke detector is inoperative.

If smoke is detected in the avionics bay:

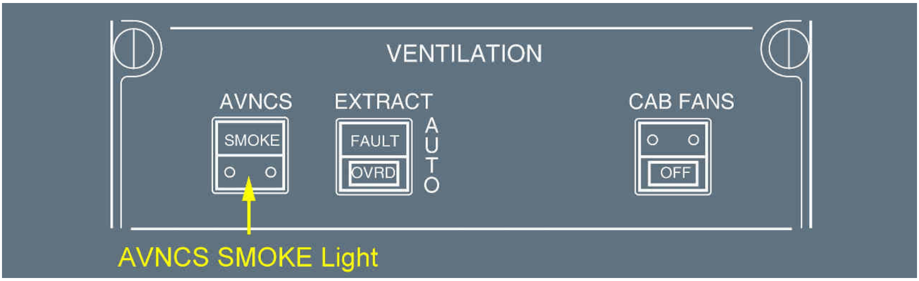
- A Repetitive Chime (CRC) sounds
- The MASTER WARNING lights flash
- The ECAM SMOKE AVNCS VENT SMOKE alert triggers
- The SMOKE light, on the VENTILATION panel, comes on.


CABIN FANS
FLIGHT DECK PANELS
EQUIPMENT RACKS
EXTRACT FAN
INBOARD VALVE
OVERBOARD VALVE
PARTIAL CLOSURE
CLOSURE
AND *
SDCU
or
CIDS-SDF
ECAM
VENTILATION
AVNCS
SMOKE
EXTRACT
FAULT
OVRD
AUTO
CAB FANS
OFF
* "AND" Logic when both detectors are operative
"OR" Logic when either detectors is inoperative

VENTILATION PANEL

Applicable to: ALL

Ident.: DSC-26-30-20-10-00021205.0001001 / 17 MAR 17


VENTILATION
AVNCS
SMOKE
EXTRACT
FAULT
OVRD
AUTO
CAB FANS
OFF
AVNCS SMOKE Light

Ident.: DSC-26-30-20-10-00021206.0001001 / 17 MAR 17

AVNCS SMOKE LIGHT

SMOKE light : Comes on red along with a warning on ECAM, when smoke is detected in the avionics ventilation duct.

Note: *For test, Refer to DSC-26-50-20 TEST pb.*

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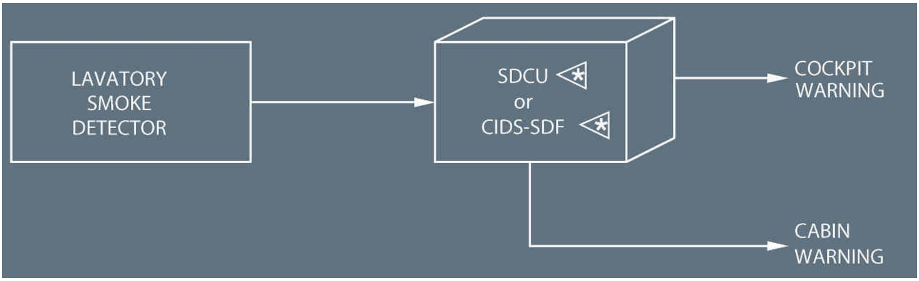
SMOKE DETECTION

Ident.: DSC-26-40-10-00021207.0001001 / 17 MAR 17
Applicable to: ALL

The smoke detection system of the lavatory consists of:

- Smoke detectors, in the air extraction duct of each lavatory
- A Smoke Detection Control Unit (SDCU) ◁ or a Cabin Intercommunication Data System (CIDS) with a Smoke Detection Function (SDF) ◁ that triggers the applicable alerts (cockpit and cabin).

In the case of smoke in a lavatory, the smoke detector sends a signal to the SDCU or the CIDS-SDF, which transmits it to the Flight Warning Computer (FWC) for warning in the cockpit and in the cabin.



WASTE BIN FIRE EXTINGUISHING

Ident.: DSC-26-40-10-00000452.0001001 / 21 MAR 17
Applicable to: ALL

There is an automatic fire extinguishing system in the wastebin of each lavatory.

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SMOKE DETECTION

Ident.: DSC-26-50-10-10-00021209.0001001 / 31 AUG 18
Applicable to: ALL

The smoke detection system of the cargo compartments consists of:

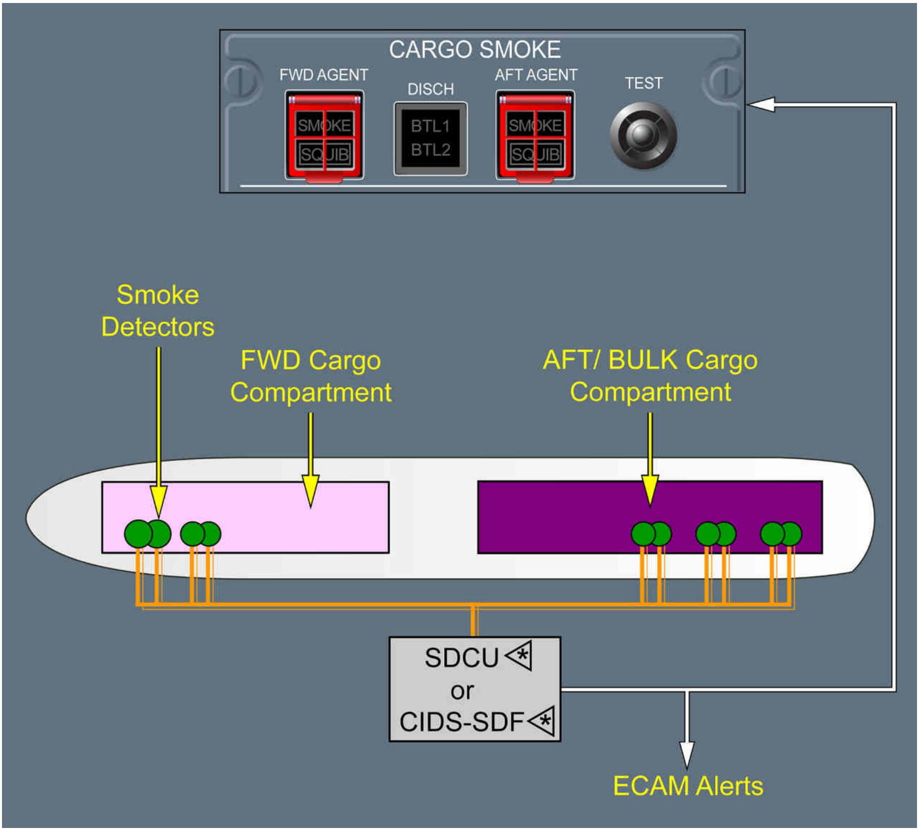
- Smoke detectors, that are housed in pairs in cavities within the cargo compartment ceiling panels

  There are:
  - Two cavities in the forward cargo compartment
  - Two cavities in the aft cargo compartment
  - One cavity in the bulk cargo compartment.
- A Smoke Detection Control Unit (SDCU) ◁ or a Cabin Intercommunication Data System (CIDS) with a Smoke Detection Function (SDF) ◁ , that receives signals from the smoke detectors, and transmits them to the ECAM.

If smoke is detected in the cargo compartment:

- The Continuous Repetitive Chime (CRC) sounds
- The MASTER WARNING lights flash
- The associated cargo compartment SMOKE alert is triggered
- The COND SD page is displayed
- On the CARGO SMOKE panel, the associated SMOKE light comes on in red.

When the cargo smoke warning triggers, the isolation valves of the cargo ventilation system ◁ of the affected compartment close automatically, and the extraction fan stops.


CARGO SMOKE
FWD AGENT
DISCH
AFT AGENT
TEST
SMOKE
SQUIB
BTL1
BTL2
SMOKE
SQUIB
Smoke Detectors
FWD Cargo Compartment
AFT/ BULK Cargo Compartment
SDCU
or
CIDS-SDF
ECAM Alerts

Ident.: DSC-26-50-10-10-00021213.0003001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

The cargo smoke warning triggers, if:
- Both smoke detectors detect smoke, or
- One smoke detector detects smoke, and the other smoke detector is inoperative
- Two smoke detectors detect smoke in different cavities.

Ident.: DSC-26-50-10-10-00021213.0001001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

The cargo smoke warning triggers, if:
- Both smoke detectors detect smoke, or
- One smoke detector detects smoke, and the other smoke detector is inoperative.

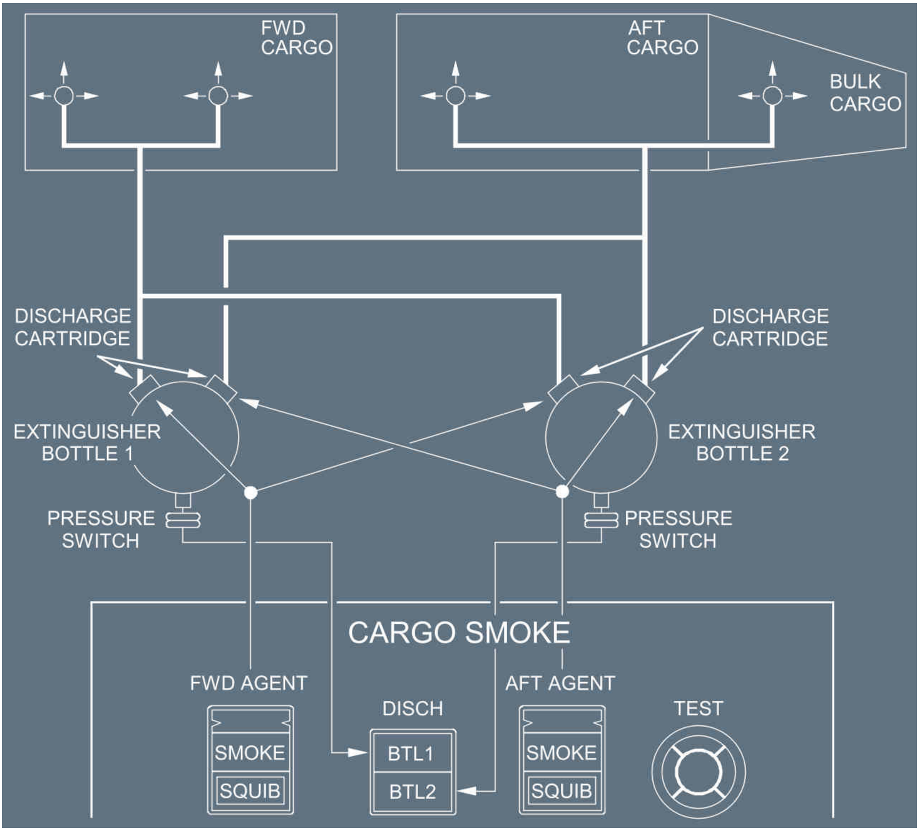
FIRE EXTINGUISHING

Ident.: DSC-26-50-10-00021210.0003001 / 17 MAR 17
Applicable to: ALL

A fire extinguishing system protects the cargo compartments.
Two fire bottles with two discharge heads, one for each compartment, supply four nozzles:

- Two nozzles in the forward cargo compartment
- One nozzle in the aft cargo compartment
- One nozzle in the bulk cargo compartment.

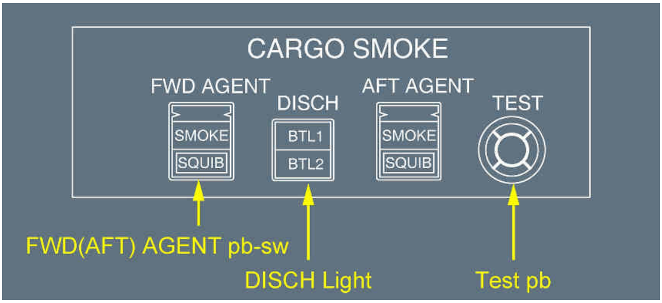
Pressing the AGENT pb, associated with the FWD (AFT/BULK) compartment, ignites the squib of the two bottles. Bottle 1 discharges its extinguishing agent into that compartment, and then bottle 2.
Bottle 1 discharges in approximately 60 s. A flow metering system controls the discharge of bottle 2, to ensure sufficient agent concentration for 260 min.
The SDCU ◁ or the CIDS-SDF ◁ monitors squib integrity and bottle pressure.
When bottle 1(2) is discharged, the BTL1(BTL2) light comes on white.


FWD CARGO
AFT CARGO
BULK CARGO
DISCHARGE CARTRIDGE
DISCHARGE CARTRIDGE
EXTINGUISHER BOTTLE 1
EXTINGUISHER BOTTLE 2
PRESSURE SWITCH
PRESSURE SWITCH
CARGO SMOKE
FWD AGENT
SMOKE
SQUIB
DISCH
BTL1
BTL2
AFT AGENT
SMOKE
SQUIB
TEST

CARGO SMOKE PANEL

Applicable to: ALL

Ident.: DSC-26-50-20-10-00021215.0001001 / 17 MAR 17



Ident.: DSC-26-50-20-10-00021216.0001001 / 17 MAR 17

FWD(AFT) AGENT PB-SW

This pushbutton-switch is guarded.
When pressed, the associated squib is ignited for discharge of the extinguishing agent in the associated cargo compartment (FWD or AFT/BULK).

SMOKE light :	Comes on red, along with an associated ECAM warning, when smoke is detected in the associated compartment.
SQUIB light :	Comes on white, in case of a positive test.

Ident.: DSC-26-50-20-10-00021217.0001001 / 17 MAR 17

DISCH LIGHT

The BTL1(2) light comes on white, when the associated bottle has discharged.

Ident.: DSC-26-50-20-10-00021218.0001001 / 17 MAR 17

TEST PB

Tests the operation of the cargo smoke detection system.

When pressed for at least 3 s, and until it is released:
- The smoke detectors in the FWD, AFT, and BULK CARGO compartment and the avionics bay are tested in sequence
- The isolation valves of the cargo ventilation system ◁ close
- BTL1(2) lights come on white

- SQUIB lights come on white, provided that one of the two squib filaments is serviceable
- SMOKE lights (AFT, FWD CARGO, and AVNCS) come on red on the overhead panel, the ECAM displays the associated warnings, and a continuous repetitive chime sounds.

Note: *Each SDCU ◁ channel or SDF ◁ controller generates its own warning, which lasts approximately 25 s, with a delay of approximately 30 s between both. The test is successful if an ECAM smoke warning is triggered at least once for each compartment (avionics bay, forward, aft, and bulk cargo compartments).*

SMOKE DETECTION

Ident.: DSC-26-56-10-00021234.0001001 / 17 MAR 17
Applicable to: ALL

The Video Control Center (VCC) ◁ and the In-Flight Entertainment Center (IFEC) ◁ each have a smoke detection system.
When smoke is detected, the ECAM displays a warning in the cockpit.

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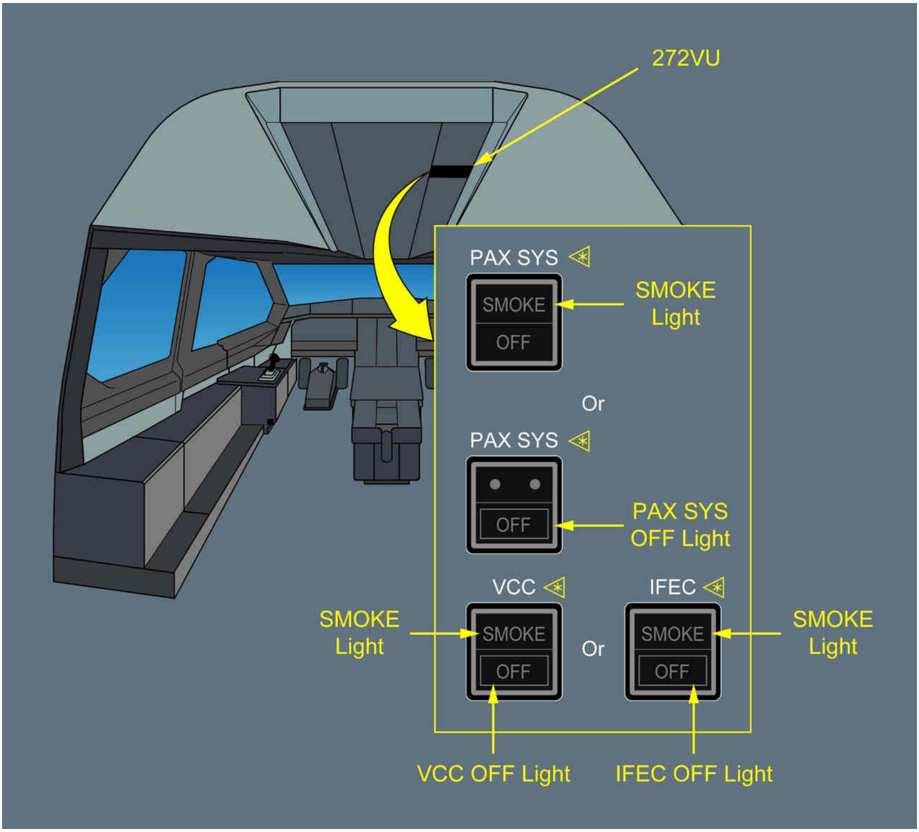
CABIN SYSTEM PANEL

Ident.: DSC-26-56-20-00021235.0001001 / 28 MAY 20
Applicable to: ALL


272VU
PAX SYS ◁
SMOKE
OFF
SMOKE Light
Or
PAX SYS ◁
OFF
PAX SYS OFF Light
VCC ◁
IFEC ◁
SMOKE Light
SMOKE
OFF
Or
SMOKE
OFF
SMOKE Light
VCC OFF Light
IFEC OFF Light

The pushbuttons described here below are installed on the cabin related panel (272 VU) on the overhead panel.
The PAX SYS pb-sw ◁ can include the SMOKE warning label. In this case, only one pushbutton is installed. Otherwise, the PAX SYS pb-sw ◁ can be associated to either VCC pb-sw ◁ and/or IFEC pb-sw ◁ .

PAX SYS OFF light : The following equipments are cut-off:
- ISPSU ◁ (PED ◁ , seat actuators)
- VCC ◁
- IFEC ◁ .

VCC/IFEC OFF light : Electrical power to VCC ◁ / IFEC ◁ is cut-off.

SMOKE light : When smoke is detected in VCC ◁ / IFEC ◁ , the SMOKE light comes on red, and the ECAM triggers the associated smoke warning.

Note: *ISPSS, seat actuators, and PED ◁ do not generate smoke indication in the cockpit.*

Smoke Detection

LOWER DECK MOBILE CREW REST COMPARTMENT

Ident.: DSC-26-57-10-10-00021236.0001001 / 17 MAR 17
Applicable to: ALL

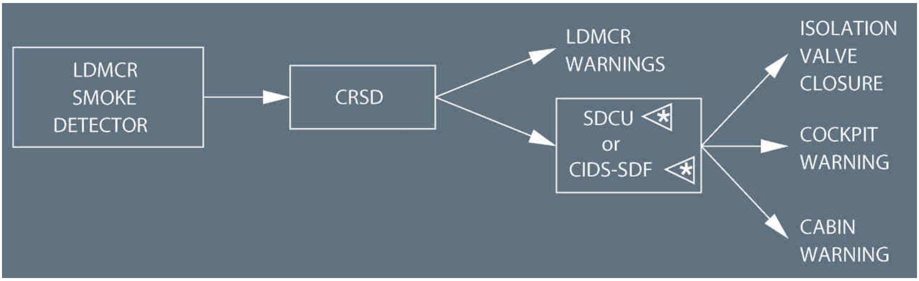
The smoke detection system of the Lower Deck Mobile Crew Rest (LDMCR) consists of:
- Smoke detectors
- A Crew Rest Smoke Detection (CRSD) control unit, located in the LDMCR
- A Smoke Detection Control Unit (SDCU) ◁ or a Cabin Intercommunication Data System (CIDS) with a Smoke Detection Function (SDF) ◁ .

When a detector detects smoke in the LDMCR, it sends a signal to the CRSD, and:
- The horn in the CRSD control unit activates
- The related smoke-detector indicator flashes on the CRSD control unit
- The CRSD control unit sends a smoke signal to the SDCU or the CIDS-SDF.

When the exit and emergency exit hatches are closed, the “DO NOT OPEN HATCH” sign comes on, in the staircase housing.

The SDCU or the CIDS-SDF transmits the smoke signal to:
- The cockpit (ECAM warning)
- The cabin (warning)
- The ventilation controller, which closes the ventilation isolation valve. In the LDMCR, the “LEAVE MCR” sign comes on, the low-flow buzzer activates, a continuous repetitive chime (CRC) sounds during 30 s, and the intensity of the lights increases to 100 %.

Note: *The internal smoke detection system is only available when electrical power is supplied to the LDMCR.*



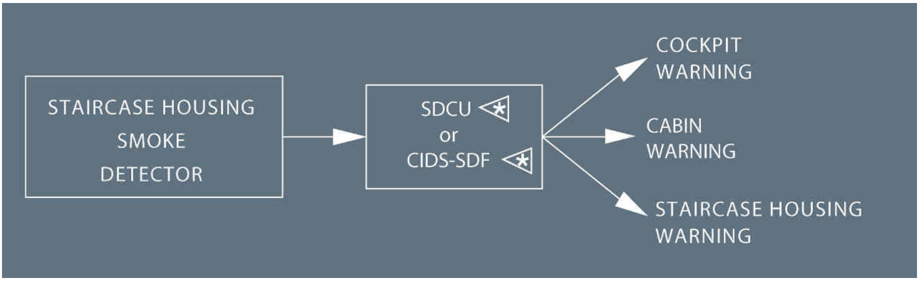
STAIRCASE HOUSING

Ident.: DSC-26-57-10-10-00021239.0002001 / 17 MAR 17
Applicable to: ALL

The smoke detection system of the staircase housing consists of:
- One smoke detector
- A Smoke Detection Control Unit (SDCU) ◁ or a Cabin Intercommunication Data System (CIDS) WITH A Smoke Detection Function (SDF) ◁ .

When the detector senses smoke in the staircase housing, it sends a signal to the SDCU or to the CIDS-SDF, that transmits it to trigger the applicable alerts in the cockpit (warning display) and in the cabin (warning display in the cabin, and visual and aural warning in the staircase housing).

Note: *The internal smoke detection system is only available when electrical power is supplied to the LDMCR.*



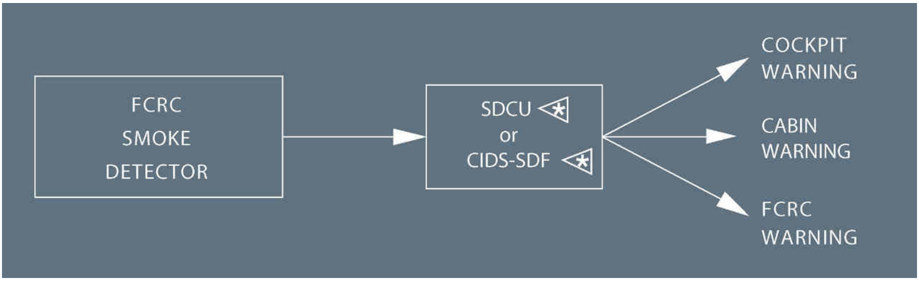
FLIGHT CREW REST COMPARTMENT

Ident.: DSC-26-57-10-10-00021240.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The smoke detection system of the Flight Crew Rest Compartment (FCRC) consists of:
- One smoke detector
- A Smoke Detection Control Unit (SDCU) or a Cabin Intercommunication Data System (CIDS) with a Smoke Detection Function (SDF) ◁ .

When the detector senses smoke in the FCRC, it sends a signal to the SDCU or to the CIDS-SDF, which transmits it to the Flight Warning Computer (for a warning display in the cockpit) and to the CIDS (for a warning display in the cabin, and a visual and aural warning in the FCRC).

Note: *The internal smoke detection system is only available when electrical power is supplied to the FCRC.*


FCRC
SMOKE
DETECTOR
SDCU
or
CIDS-SDF
COCKPIT
WARNING
CABIN
WARNING
FCRC
WARNING

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Fire Extinguishing

LOWER DECK MOBILE CREW REST COMPARTMENT

Ident.: DSC-26-57-10-20-00021243.0001001 / 17 MAR 17
Applicable to: ALL

The fire extinguishing system operates manually in the LDMCR when the Fire Extinguishing System (FES) switch, in the staircase housing, is set to the FES DISCHARGE position.
The manual circuit (FES switch) ignites the squib on the fire bottle, which discharges a fire extinguishing agent through the spray nozzles in the LDMCR.

Note: *The internal fire extinguishing system is only available when electrical power is supplied to the LDMCR.*

CAUTION	Selecting the FES switch activates the fire extinguishing system, regardless of whether smoke has been detected or not.

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SMOKE DETECTION

Ident.: DSC-26-59-10-00015686.0001001 / 05 JAN 15
Applicable to: ALL

The smoke detection system consists of two optical smoke detectors located in the ventilation system of the corresponding Broadband System in the avionics compartment.
When smoke is detected, the smoke light on the PAX BBAND pb-sw on the overhead panel comes on red along with the smoke ECAM warning.

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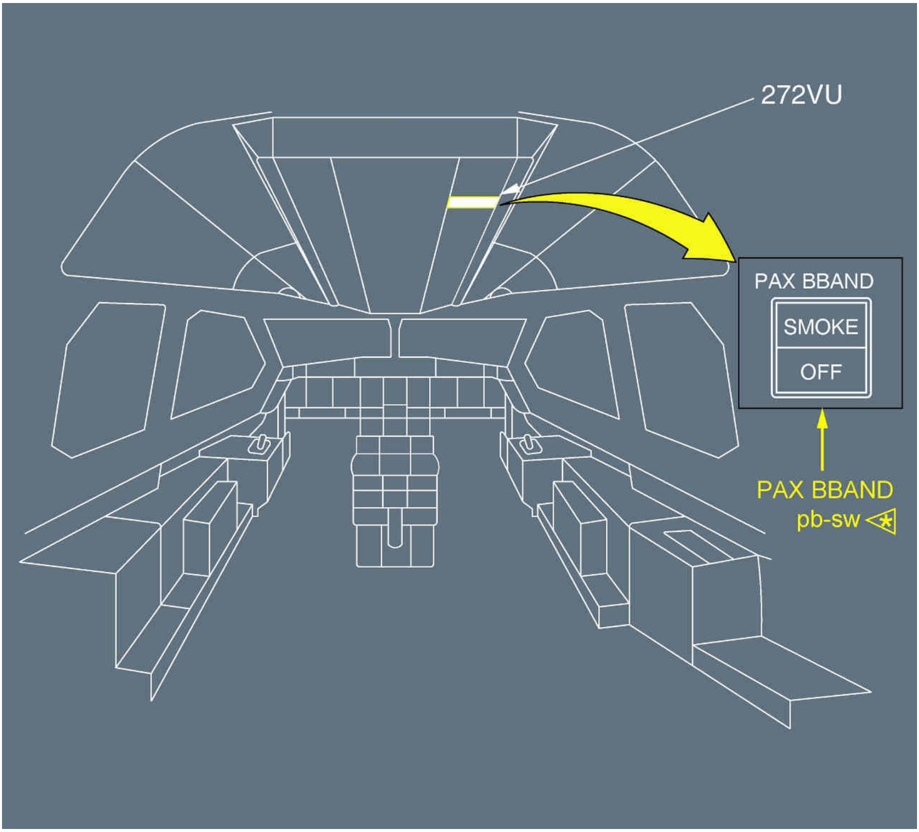
CABIN SYSTEM PANEL

Applicable to: ALL

Ident.: DSC-26-59-20-10-00021249.0001001 / 17 MAR 17



Ident.: DSC-26-59-20-10-00021250.0001001 / 17 MAR 17

PAX BBAND PB-SW ◁

SMOKE light :	When smoke is detected in the Broadband System, the SMOKE light comes on red, along with the corresponding ECAM warning. If the pushbutton-switch is not pressed approximately 3 s following the smoke warning activation, the ventilation extraction fan will automatically stop and electrical power to the Broadband System is shut down.

OFF : Electrical power to the Broadband System is cut-off.

AIRCRAFT SYSTEMS

FLIGHT CONTROLS

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DSC-27-10 General

DSC-27-10-10 General

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Control Surfaces....C
Cockpit Controls....D
Computers....E

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DSC-27-20 Flight Control System

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DSC-27-20-10-60 Turbulence Damping Function

Turbulence Damping Function....A

DSC-27-20-10-70 Enhanced Load Alleviation Function (ELAF)

Enhanced Load Alleviation Function (ELAF)....A

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Continued from the previous page

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ALT 1....................B
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DSC-27-30 Flaps and Slats

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Flap Load Relief System (FLRS)....................E
Retraction/Extension Schematic....................F
Slats Alpha/Speed Lock Function....................G
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Continued on the following page

Continued from the previous page

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GENERAL

Ident.: DSC-27-10-10-00000140.0001001 / 21 MAR 16
Applicable to: ALL

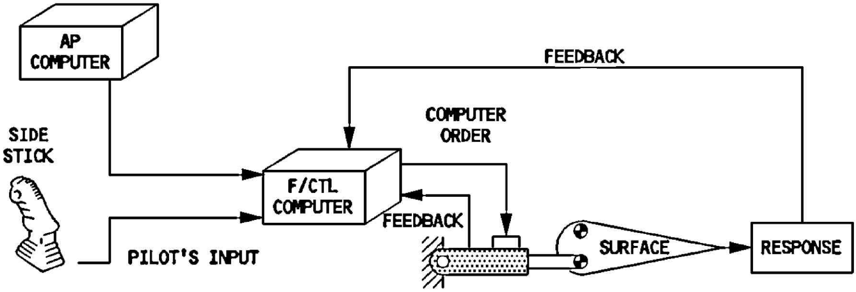
The fly-by-wire system was designed and certified to render the new generation of aircraft even more safe, cost effective, and pleasant to fly.

BASIC PRINCIPLE

Ident.: DSC-27-10-10-00000141.0002001 / 17 MAY 21
Applicable to: ALL

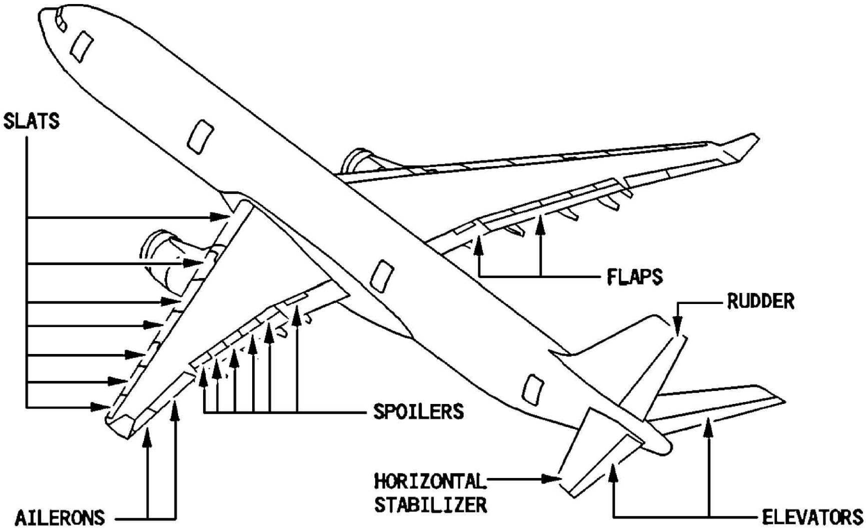
The flight control surfaces are all :
- Electrically-controlled, and
- Hydraulically-actuated.

The stabilizer can also be mechanically-controlled.
Pilots use the sidesticks to fly the aircraft in pitch and roll (and in yaw, indirectly, through turn coordination).
Computers interpret pilot input and move the flight control surfaces, as necessary, to follow their orders.
However, when in normal law, regardless of the pilot's input, the computers will prevent excessive maneuvers and exceedance of the safe envelope in pitch and roll axis.
However, as on conventional aircraft, the rudder has no such protection.



CONTROL SURFACES

Ident.: DSC-27-10-10-00000156.0004001 / 21 MAR 16
Applicable to: ALL


SLATS
FLAPS
RUDDER
SPOILERS
HORIZONTAL
STABILIZER
AILERONS
ELEVATORS

PITCH AXIS

Elevator control = Electrical

Stabilizer control = Electrical for normal or alternate control.
Mechanical for manual trim control

ROLL AXIS

Aileron control = Electrical

Spoiler control = Electrical

YAW AXIS

Rudder control = Electrical

OTHER CONTROLS

Speedbrakes = Electrical

Note: *All surfaces are hydraulically-actuated.*

COCKPIT CONTROLS

Ident.: DSC-27-10-10-00000158.0002001 / 27 JAN 11
Applicable to: ALL

- Two sidestick controllers are used for pitch and roll manual control. One is on the CAPT's lateral console, the other is on the FO's lateral console.
  The two controllers are springloaded to neutral, and are not mechanically coupled.
  Each controller independently sends electrical signals to the flight control computers.
- Two pairs of rigidly interconnected pedals ensure electrical control of the rudder.
- A speedbrake control lever is provided in the center pedestal.
- Two handwheels, on the center pedestal, are used to mechanically control the THS.
- A switch, installed on the center pedestal, ensures the rudder trim control.
- No manual aileron trim switch is provided.

COMPUTERS

Applicable to: ALL

Ident.: DSC-27-10-10-A-00000159.0001001 / 27 JAN 11

GENERAL

Five flight control computers process pilot and autopilot inputs according to normal, alternate or direct flight control laws.
The computers are:

Ident.: DSC-27-10-10-A-00000160.0003001 / 21 MAR 16

3 PRIM computers

(Flight Control Primary Computer – FCPC), each of which is used for :

- Normal, alternate, and direct control laws.
- Speedbrake and ground spoiler control.
- Protection speed computation.
- Rudder travel limit.

Ident.: DSC-27-10-10-A-00000162.0001001 / 27 JAN 11

2 SEC COMPUTERS

(Flight Control Secondary Computer – FCSC) for :

- Direct control laws, including yaw damper function.
- Rudder trim, and rudder travel limit.

One computer of any type is capable of controlling the aircraft and of assuring safe flight and landing.

In normal operation, one PRIM computer is declared to be the master (P1). It processes the orders and sends them to the other computers (P1 / P2 / P3 / S1 / S2), which will then execute them on their related servo-control.
If one computer is unable to execute the orders sent by the master, another computer executes the task of the affected computer (except for spoiler control).
If the master computer (P1) cannot be the master, then P2 (or P3, if P2 is not available) becomes the master.

Note: *When the green hydraulic system is lost, P2 replaces P1 as the master computer.*

In case all PRIM computers are lost, each SEC is its own master and controls its associated servoloop in direct law.
A single SEC can provide complete aircraft control in direct law.

Ident.: DSC-27-10-10-A-00000172.0004001 / 23 JUN 14

2 FCDC COMPUTERS

The FCDCs acquire data from the PRIMs and SECs and send this data to the EIS and CMC.

Note: *On ground, a spurious "RUD TRV LIM" could be displayed on INOP SYS ECAM status page, in case of one FCDC does not detect its ground condition. This message will disappear as soon as the rudder control is pressurized by hydraulic.*

Ident.: DSC-27-10-10-A-00003939.0001001 / 27 JAN 11

1 BACKUP CONTROL MODULE (BCM) COMPUTER

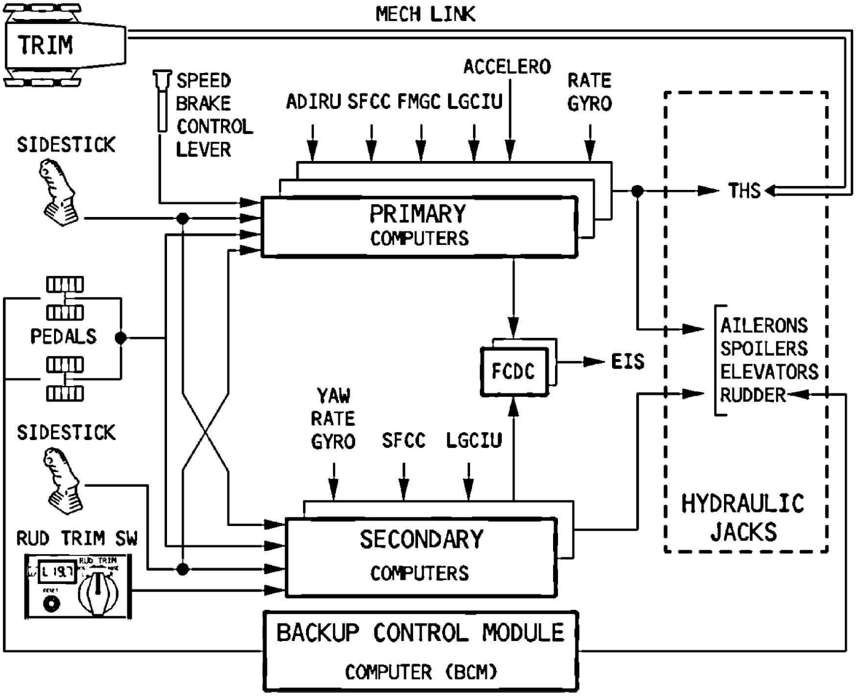
The BCM computer provides yaw damping, and direct rudder command with pedals, via an independent unit, in case of:
- Total electrical failure, or
- Loss of rudder control due to a Flight Control Computer (PRIM and SEC) failure.

It includes:
- Its own electrical generator, referred to as the Backup Power Supply (BPS), which is supplied by the B or Y hydraulic system
- Its own sensors (gyrometers and pedals deflection)
- Control of the B and Y hydraulic actuators.

When activated, as in yaw alternate law, there is no turn coordination.

Ident.: DSC-27-10-10-A-00003940.0003001 / 27 JAN 11

SCHEMATICS


MECH LINK
TRIM
SPEED
BRAKE
CONTROL
LEVER
ACCELERO
ADIRU SFCC FMGC LGCIU
RATE
GYRO
SIDESTICK
PRIMARY
COMPUTERS
THS
PEDALS
FCDC
EIS
AILERONS
SPOILERS
ELEVATORS
RUDDER
YAW
RATE
GYRO
SFCC
LGCIU
SIDESTICK
RUD TRIM SW
SECONDARY
COMPUTERS
HYDRAULIC
JACKS
BACKUP CONTROL MODULE
COMPUTER (BCM)

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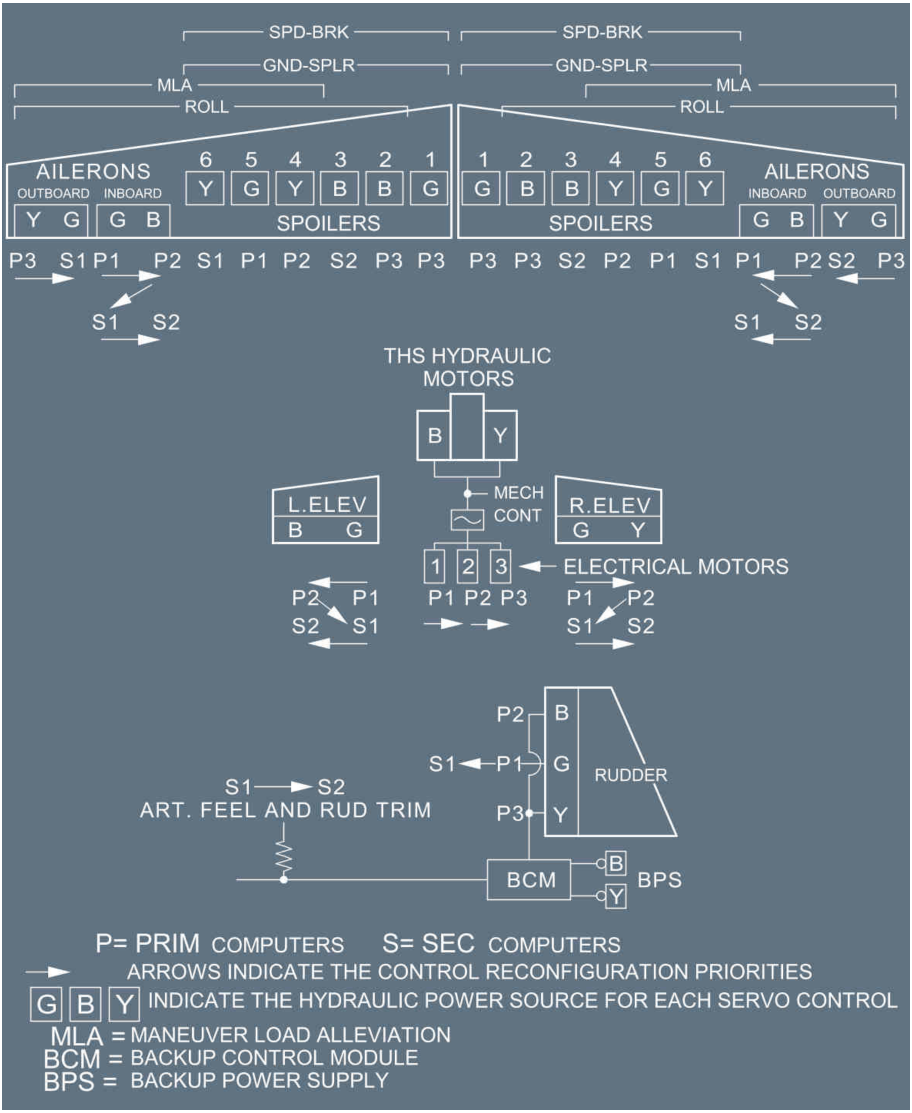
GENERAL ARCHITECTURE

Ident.: DSC-27-10-20-00000184.0003001 / 21 MAR 16

Applicable to: ALL

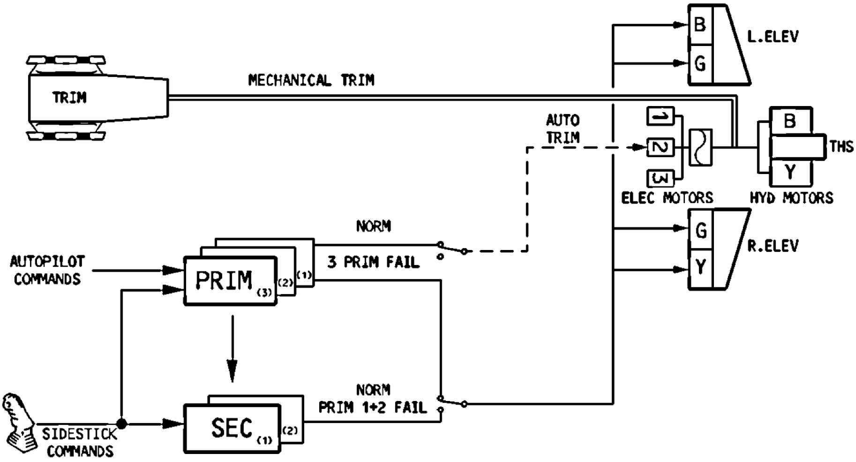

SPD-BRK
GND-SPLR
MLA
ROLL
SPD-BRK
GND-SPLR
MLA
ROLL
AILERONS
OUTBOARD
INBOARD
Y G
G B
6 5 4 3 2 1
Y G Y B B G
SPOILERS
1 2 3 4 5 6
G B B Y G Y
SPOILERS
AILERONS
INBOARD
OUTBOARD
G B
Y G
P3 S1 P1 P2 S1 P1 P2 S2 P3 P3
P3 P3 S2 P2 P1 S1 P1 P2 S2 P3
S1 S2
S1 S2
THS HYDRAULIC MOTORS
B Y
MECH CONT
L.ELEV
B G
R.ELEV
G Y
1 2 3
ELECTRICAL MOTORS
P2 P1
S2 S1
P1 P2 P3
P1 P2
S1 S2
P2
B
S1
P1
G
RUDDER
P3
Y
S1 S2
ART. FEEL AND RUD TRIM
BCM
B
Y
BPS
P= PRIM COMPUTERS S= SEC COMPUTERS
ARROWS INDICATE THE CONTROL RECONFIGURATION PRIORITIES
G B Y INDICATE THE HYDRAULIC POWER SOURCE FOR EACH SERVO CONTROL
MLA = MANEUVER LOAD ALLEVIATION
BCM = BACKUP CONTROL MODULE
BPS = BACKUP POWER SUPPLY

PITCH CONTROL

Applicable to: ALL

Ident.: DSC-27-10-20-A-00000185.0001001 / 27 JAN 11

GENERAL


TRIM
MECHANICAL TRIM
B
G
L.ELEV
AUTO TRIM
1
2
3
ELEC MOTORS
B
Y
THS
HYD MOTORS
G
Y
R.ELEV
NORM
3 PRIM FAIL
AUTOPILOT COMMANDS
PRIM (3) (2) (1)
NORM
PRIM 1+2 FAIL
SEC (1) (2)
SIDESTICK COMMANDS

Two elevators and the trimmable horizontal stabilizer (THS) control the aircraft in pitch. The maximum elevator deflection is 30 ° nose up and 15 ° nose down. The maximum THS deflection is 14 ° nose up and 2 ° nose down.

Ident.: DSC-27-10-20-A-00000187.0001001 / 30 JAN 13

ELECTRICAL CONTROL

- In normal operations, the PRIM 1 controls the elevators and the horizontal stabilizer, and the green hydraulic jacks drive the left and right elevator surfaces.
  The THS is driven by N° 1 of three electric motors.
- If a failure occurs in PRIM 1 or the associated hydraulic systems or hydraulic jacks, the system shifts pitch control to PRIM 2. PRIM 2 then controls the elevators via the blue and yellow hydraulic jacks and controls the THS via the N° 2 electric motor.
- If neither PRIM 1 nor PRIM 2 are available, the system shifts pitch control to SEC 1 for elevator control, and to PRIM 3 for THS control via the N° 3 electric motor.
- In case of 3 PRIM failure, SEC 1 controls the elevator. Electrical control of THS is lost. THS actuation is still available through manual pitch trim wheel control.

Ident.: DSC-27-10-20-A-00000188.0001001 / 21 MAR 16

MECHANICAL CONTROL

Mechanical control of the THS is available from the pitch trim wheel, at any time, if either the blue or the yellow hydraulic system is functioning.
Mechanical control from the pitch trim wheel has priority over electrical control.

Ident.: DSC-27-10-20-A-00000212.0001001 / 21 MAR 16

ACTUATION

Elevators

- Two electrically controlled hydraulic servojacks drive each elevator.

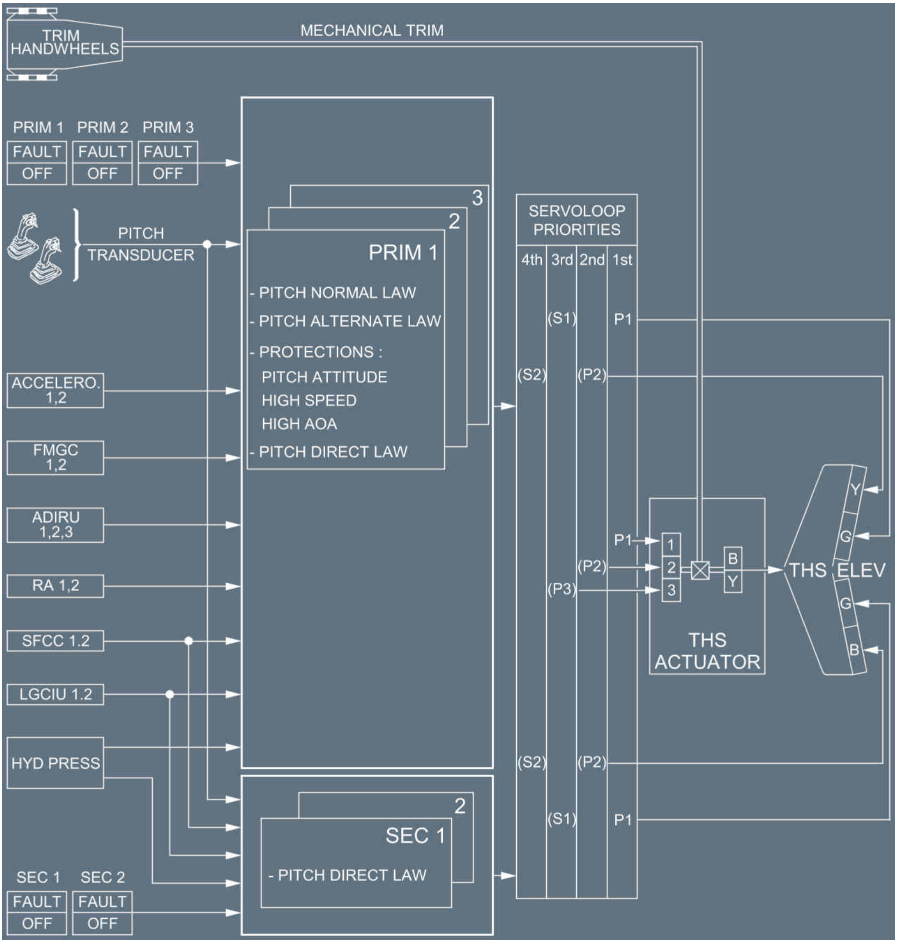
  Each servojack has three control modes :
  - Active : Jack position is electrically controlled.
  - Damping : Jack follows surface movement.
  - Centering : Jack is hydraulically maintained in neutral position.
- In normal operation:
  - One jack is in active mode.
  - The other jack is in damping mode.
  - Some maneuvers cause the second jack to become active.
- If the active servojack fails, the damped one becomes active and the failed jack is automatically switched to the damping mode.
  If neither jack is being controlled electrically nor hydraulically, both are automatically switched to the damping mode.
  If neither of the four jacks is being controlled electrically, the four jacks are automatically switched to the centering mode.

Stabilizer

- A screwjack driven by two hydraulic motors drives the stabilizer.
- The two hydraulic motors are controlled by :
  - one of three electric motors, or
  - the mechanical trim wheel.

Ident.: DSC-27-10-20-A-00000213.0001001 / 22 MAY 12

L3 SCHEMATIC

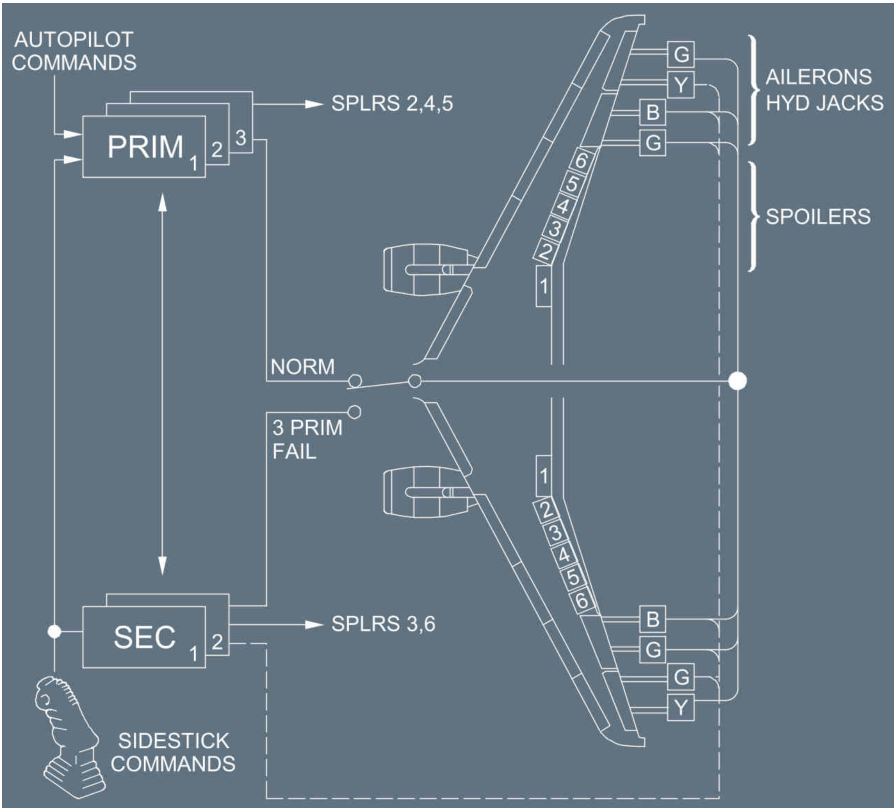

TRIM HANDWHEELS
MECHANICAL TRIM
PRIM 1
PRIM 2
PRIM 3
FAULT
OFF
PITCH TRANSDUCER
ACCELERO. 1,2
FMGC 1,2
ADIRU 1,2,3
RA 1,2
SFCC 1.2
LGCIU 1.2
HYD PRESS
SEC 1
SEC 2
FAULT
OFF
3
2
PRIM 1
- PITCH NORMAL LAW
- PITCH ALTERNATE LAW
- PROTECTIONS :
PITCH ATTITUDE
HIGH SPEED
HIGH AOA
- PITCH DIRECT LAW
2
SEC 1
- PITCH DIRECT LAW
SERVOLOOP PRIORITIES
4th
3rd
2nd
1st
(S1)
P1
(S2)
(P2)
P1
(P2)
(P3)
(S2)
(P2)
(S1)
P1
1
2
3
B
Y
THS ACTUATOR
THS
ELEV
Y
G
G
B

ROLL CONTROL

Applicable to: ALL

Ident.: DSC-27-10-20-B-00000215.0002001 / 09 OCT 12

GENERAL


AUTOPILOT COMMANDS
PRIM 1 2 3
SPLRS 2,4,5
AILERONS HYD JACKS
G
Y
B
G
SPOILERS
6 5 4 3 2 1
NORM
3 PRIM FAIL
1 2 3 4 5 6
B
G
G
Y
SEC 1 2
SPLRS 3,6
SIDESTICK COMMANDS

Two ailerons and five spoilers on each wing control the aircraft about the roll axis.
The maximum deflection of the ailerons is 25 °.
Ailerons extend when the flaps are extended (aileron droop).
The maximum spoiler deflection is 35 °.

Ident.: DSC-27-10-20-B-00000216.0001001 / 21 MAR 16

ELECTRICAL CONTROL

- Inner ailerons are normally controlled by PRIM 1 (LH) and 2 (RH) with each of these computers being capable of controlling both sides. SEC 1 and 2 provide the back up control in case of PRIM 1 and 2 failure.
- The outboard ailerons are normally controlled by PRIM 3. SEC 1 and 2 provide the backup control in case of PRIM 3 failure.
- The SECs control the N° 3 and 6 spoilers ; the PRIMs control the N° 2, 4 and 5 spoilers.

Ident.: DSC-27-10-20-B-00000223.0001001 / 21 MAR 16

ACTUATION

AILERONS

Two electrically-controlled hydraulic servojacks drive each aileron.

Each servojack has two control modes :
- Active : Jack position is electrically controlled.
- Damping : Jack follows surface movement.

The system automatically selects damping mode, in the event of green and yellow or blue and green low pressure, or if the respective computer fails.
At high speed (above 190 kt, in CONF 0), the outboard ailerons are controlled to zero deflection.
In some failure cases, in autopilot mode, the outboard ailerons are used up to 300 kt.
When the emergency generator is only supplied by the RAT, the outer ailerons are controlled in damping mode to reduce hydraulic power consumption.

SPOILERS

A servojack positions each spoiler. Each servojack receives hydraulic power from either the green, yellow, or blue hydraulic system, controlled by the PRIM or SEC (*Refer to DSC-27-10-20 Speedbrake and Ground Spoiler Control - Roll Control-Schematic*).
The system automatically retracts the spoilers to their zero position, if it detects a fault or loses electrical control.
If the system loses hydraulic pressure, the spoiler retains the deflection it had at the time of the loss, or a lesser deflection if aerodynamic forces push it down.
When a spoiler surface on one wing fails, the symmetric one on the other wing is inhibited (except for spoilers 4 and 6).

SPEEDBRAKE AND GROUND SPOILER CONTROL

Applicable to: ALL

Ident.: DSC-27-10-20-C-00000234.0005001 / 10 MAY 21

SPEED BRAKE CONTROL

The flight crew controls the speedbrakes with the speedbrake control lever.
The speedbrakes are spoilers 1 to 6.

Speedbrake extension is inhibited, if:
- MLA is activated, or
- Angle-of-attack protection is active, or
- Low speed stability is active, or
- At least one thrust lever is above MCT position, or
- Alpha floor is activated.

If an inhibition occurs when the speedbrakes are extended, they automatically retract and stay retracted until the inhibition condition disappears, and the flight crew resets the lever (the speedbrakes can be extended again, 5 s after the lever is reset). When a speedbrake surface on one wing fails, the symmetric speedbrake surface on the other wing is inhibited.

L2 The maximum deflection for the spoilers is:
- 25 ° for spoiler 1
- 30 ° for spoilers 2 to 6.

The maximum deflection for the spoilers is reduced in CONF 2, 3 and FULL.
For surfaces 2 to 6 (that perform roll and speedbrake functions), the roll function has priority: When the sum of a roll order and a simultaneous speedbrake order on one surface is more than the maximum deflection achievable in flight, the symmetric speedbrake on the other wing is retracted until the difference between the two surfaces is equal to the roll order.

Ident.: DSC-27-10-20-C-00000239.0004001 / 17 OCT 17

GROUND SPOILER CONTROL

Spoilers 1 to 6 act as ground spoilers.
When a ground spoiler surface on one wing fails, the symmetric one on the other wing is inhibited.

ARMING

The pilot arms the ground spoiler function by pulling the speedbrake control lever up into the armed position.

FULL EXTENSION - REJECTED TAKEOFF PHASE

- If the ground spoilers are armed and the wheel speed exceeds 72 kt, the ground spoilers will automatically extend as soon as all thrust levers are set to idle.
- If the ground spoilers are not armed and the wheel speed exceeds 72 kt, the ground spoilers will automatically extend as soon as reverse is selected on at least one engine (remaining engine at idle).

FULL EXTENSION - LANDING PHASE / BOUNCE

- If the ground spoilers are armed and all thrust levers are at idle, the ground spoilers will automatically extend as soon as both main landing gears have touched down.
- If the ground spoilers are not armed and both main landing gears have touched down, the ground spoilers will automatically extend as soon as reverse is selected on at least one engine (remaining engine at idle).

PARTIAL EXTENSION

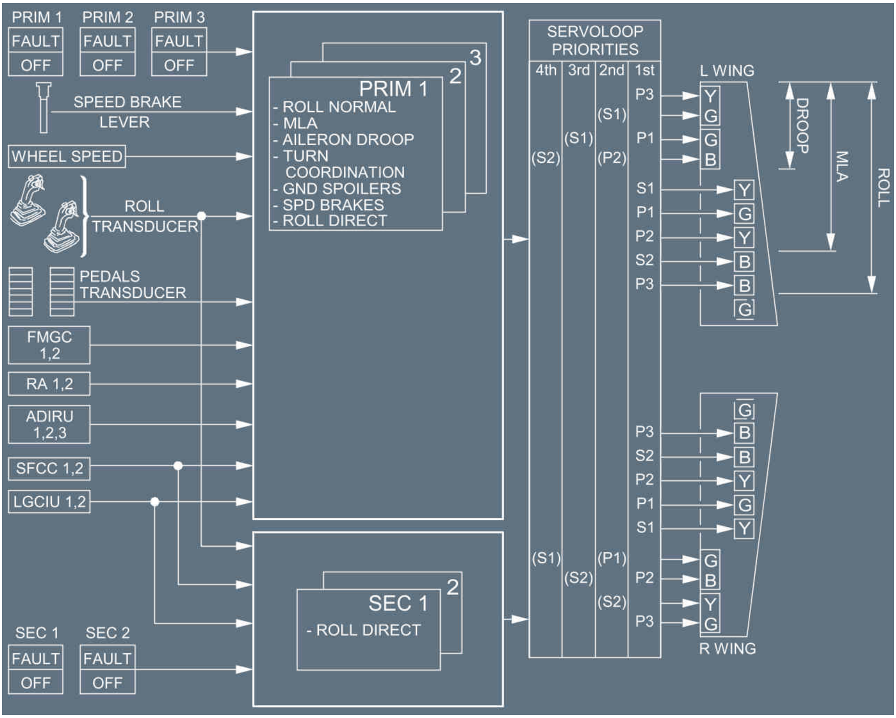
The ground spoilers partially extend when reverse is selected on at least one engine (other engine at idle) and one main landing gear is compressed.
This partial extension, by decreasing the lift, will ease the compression of the second main landing gear, and consequently will lead to the normal ground spoiler extension.

RETRACTION

The ground spoilers retract when:
- One thrust lever is above idle, or
- All thrust levers are at forward idle, and the speedbrake control lever is pushed down.

Ident.: DSC-27-10-20-C-00000241.0001001 / 09 OCT 12

L3 SCHEMATIC

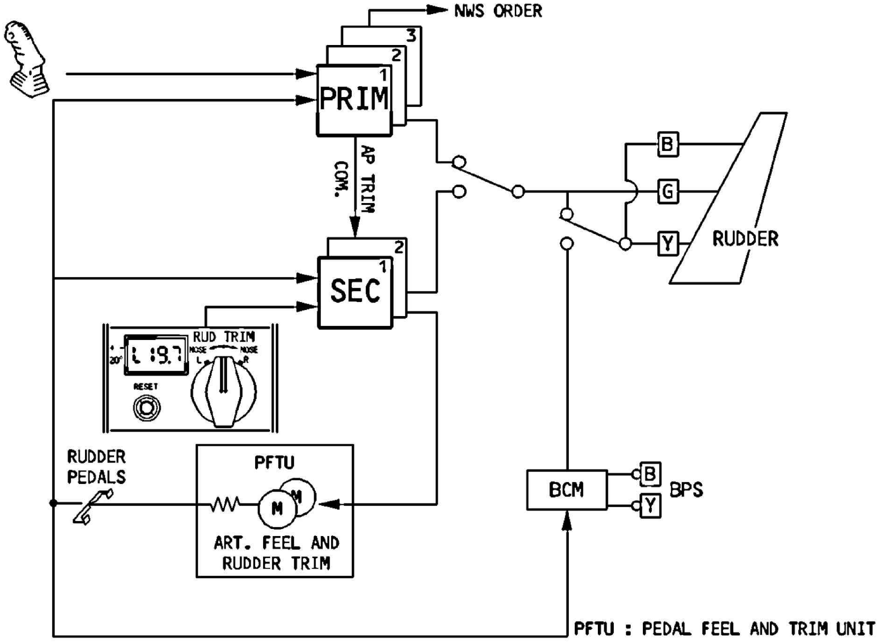

PRIM 1
PRIM 2
PRIM 3
FAULT
OFF
SPEED BRAKE LEVER
WHEEL SPEED
ROLL TRANSDUCER
PEDALS TRANSDUCER
FMGC 1,2
RA 1,2
ADIRU 1,2,3
SFCC 1,2
LGCIU 1,2
SEC 1
SEC 2
PRIM 1
2
3
- ROLL NORMAL
- MLA
- AILERON DROOP
- TURN COORDINATION
- GND SPOILERS
- SPD BRAKES
- ROLL DIRECT
SEC 1
- ROLL DIRECT
SERVOLOOP PRIORITIES
4th
3rd
2nd
1st
P3
P1
S1
P2
S2
(S1)
(S2)
(P2)
(P1)
L WING
R WING
Y
G
B
DROOP
MLA
ROLL

YAW CONTROL

Applicable to: ALL

Ident.: DSC-27-10-20-D-00000243.0002001 / 04 MAR 14

GENERAL


NWS ORDER
3
2
1
PRIM
COM.
AP TRIM
B
G
Y
RUDDER
2
1
SEC
RUD TRIM
NOSE L
NOSE R
20°
L 19.7
RESET
RUDDER PEDALS
PFTU
M
M
ART. FEEL AND RUDDER TRIM
BCM
B
Y
BPS
PFTU : PEDAL FEEL AND TRIM UNIT

Yaw control is achieved by one rudder surface.

Ident.: DSC-27-10-20-D-00000251.0002001 / 04 MAR 14

ELECTRICAL RUDDER CONTROL

- In normal operation, PRIM 1 controls the green hydraulic servo control, PRIM 2 controls the blue hydraulic servo control, and PRIM 3 controls the yellow hydraulic servo control.
- If all the 3 PRIMs fail, SEC 1 controls the green hydraulic servo control.
- In case of a total electrical failure, or loss of rudder control due to flight control computers failure, the Backup Control Module (BCM) controls the yellow hydraulic servo control, or the blue hydraulic servo control, if the yellow hydraulic servo control is not available.

Ident.: DSC-27-10-20-D-00000253.0002001 / 04 MAR 14

RUDDER ACTUATION

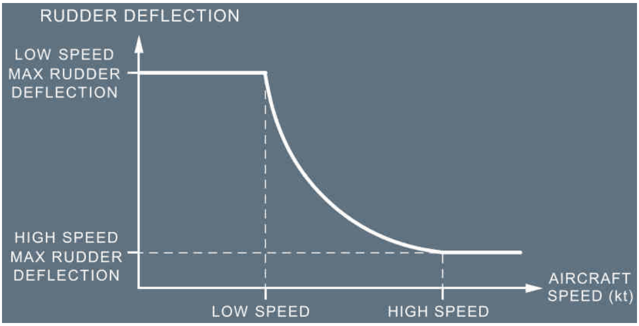
The rudder is actuated by 3 independent hydraulic servo controls operating in parallel.

- In normal operation, the 3 servo controls are simultaneously in active mode.
- In case of an electrical or hydraulic failure, the corresponding servo control is in damping mode.

Ident.: DSC-27-10-20-D-00000255.0003001 / 19 MAR 14

RUDDER TRAVEL LIMIT

The maximum rudder travel deflection gradually reduces as the speed increases, to avoid high structural loads :



In the case of a failure that causes loss of the Rudder Travel Limit function, the rudder deflection limit stops at the last value reached. At slats' extension, full rudder authority is recovered.
In all cases, the available rudder deflection provides sufficient yaw control within the entire flight envelope. This includes the case of maximum asymmetric thrust.

Ident.: DSC-27-10-20-D-00015248.0002001 / 04 MAR 14

RELATIONSHIP BETWEEN SIDESLIP/RUDDER DEFLECTION/ RUDDER PEDAL TRAVEL

Regardless of the aircraft speed, therefore the maximum rudder deflection, full rudder pedal travel remains available. However, except at low speed, maximum rudder deflection is achieved before reaching maximum rudder pedal travel.

Ident.: DSC-27-10-20-D-00000256.0005001 / 04 MAR 14

RUDDER TRIM

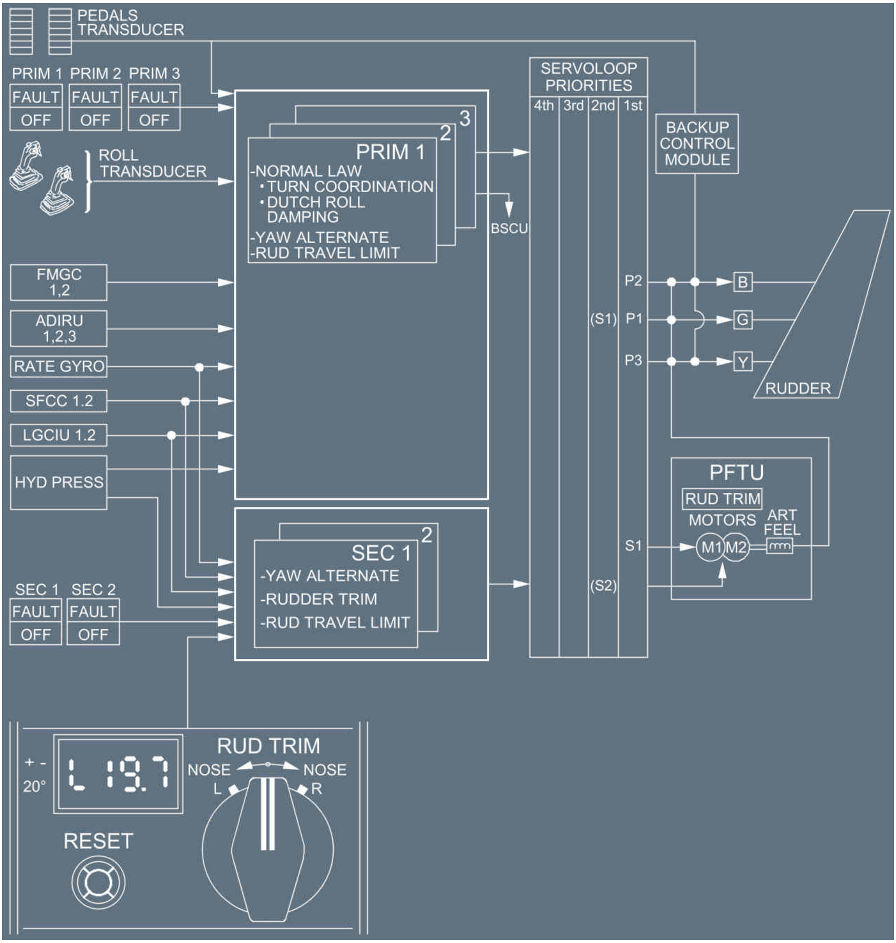
Inside the PFTU, artificial feel and rudder trim are achieved by two electric motors that position the artificial feel unit. In normal operation SEC 1/MOTOR 1 operate with SEC 2/MOTOR 2 synchronized as a backup.

In manual flight, the pilot can apply rudder trim via the RUD TRIM rotary switch located on the pedestal.
A button is provided on the RUD TRIM panel to reset the rudder trim to zero.

Note: *With the autopilot engaged, rudder trim orders are computed by PRIM and transmitted to the SEC for actuation. The rudder trim switch and the rudder trim reset pushbutton are not active.*

Ident.: DSC-27-10-20-D-00000258.0006001 / 09 OCT 12

L3 SCHEMATIC

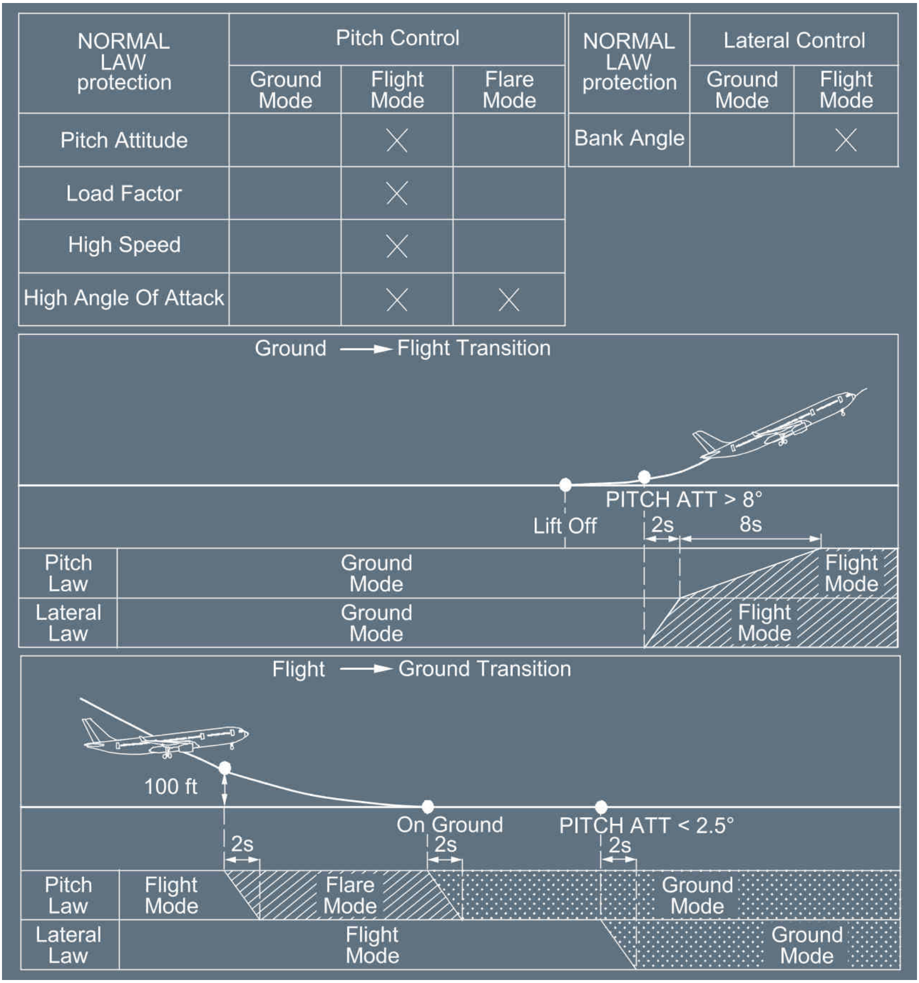

PEDALS TRANSDUCER
PRIM 1
PRIM 2
PRIM 3
FAULT
OFF
ROLL TRANSDUCER
PRIM 1
-NORMAL LAW
• TURN COORDINATION
• DUTCH ROLL DAMPING
-YAW ALTERNATE
-RUD TRAVEL LIMIT
2
3
BSCU
SERVOLOOP PRIORITIES
4th
3rd
2nd
1st
BACKUP CONTROL MODULE
FMGC 1,2
ADIRU 1,2,3
RATE GYRO
SFCC 1.2
LGCIU 1.2
HYD PRESS
P2
(S1)
P1
P3
B
G
Y
RUDDER
PFTU
RUD TRIM MOTORS
ART FEEL
M1
M2
S1
(S2)
SEC 1
-YAW ALTERNATE
-RUDDER TRIM
-RUD TRAVEL LIMIT
SEC 1
SEC 2
RUD TRIM
NOSE L
NOSE R
+ -
20°
L 19.7
RESET

General

GENERAL

Ident.: DSC-27-20-10-10-00000268.0002001 / 17 MAR 17
Applicable to: ALL

Flight control normal law provides:
- 3 Axis control
- Flight envelope protection
- Maneuver load alleviation



NORMAL LAW protection	Pitch Control		
	Ground Mode	Flight Mode	Flare Mode
Pitch Attitude		X	
Load Factor		X	
High Speed		X	
High Angle Of Attack		X	X

NORMAL LAW protection	Lateral Control	
	Ground Mode	Flight Mode
Bank Angle		X

Ground → Flight Transition
Lift Off
PITCH ATT > 8°
2s
8s
Pitch Law
Ground Mode
Flight Mode
Lateral Law
Ground Mode
Flight Mode
Flight → Ground Transition
100 ft
2s
On Ground
2s
PITCH ATT < 2.5°
2s
Pitch Law
Flight Mode
Flare Mode
Ground Mode
Lateral Law
Flight Mode
Ground Mode

One of the PF's primary tasks is to maintain the aircraft within the limits of the normal flight envelope. However, some circumstances, due to extreme situations or aircraft mishandling, may provoke the violation of these limits.

Despite system protections, the PF must not deliberately exceed the normal flight envelope. In addition, these protections are not designed to be structural limit protections (e.g. opposite rudder pedal inputs). Rather, they are designed to assist the PF in emergency and stressful situations, where only instinctive and rapid reactions will be effective.

Protections are intended to:

- Provide full authority to the PF to consistently achieve the best possible aircraft performance in extreme conditions
- Reduce the risks of overcontrolling, or overstressing the aircraft
- Provide PF with an instinctive and immediate procedure to ensure that the PF achieves the best possible result.

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Pitch Control

GROUND MODE

Ident.: DSC-27-20-10-20-00000269.0003001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

Ground mode is active on ground. It is a direct relationship between the sidestick deflection and elevator deflection without auto trim. The THS is automatically set at 4 ° up (inside the green band). Manual setting according to CG has priority for take off.
The rotation maneuver is flown in direct law, with full authority.
Immediately after the aircraft becomes airborne, the flight mode is progressively blended in. The reverse process occurs after touchdown.

GROUND MODE

Ident.: DSC-27-20-10-20-00000269.0004001 / 16 MAR 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

Ground mode is active on ground. It is a direct relationship between sidestick deflection and elevator deflection without auto trim.
The THS is automatically set at 4 ° UP (inside the green band). Before departure, as soon as the three hydraulic systems are available, the THS is automatically set to the takeoff value, calculated by the PRIM, according to the ZFWCG entered in the MCDU and the fuel distribution. This automatic setting occurs only one time, and the flight crew can override it at any time.
The rotation maneuver is flown in direct law, with full authority.
Immediately after the aircraft becomes airborne, the flight mode is progressively blended in. The reverse process occurs after touchdown.

FLIGHT MODE

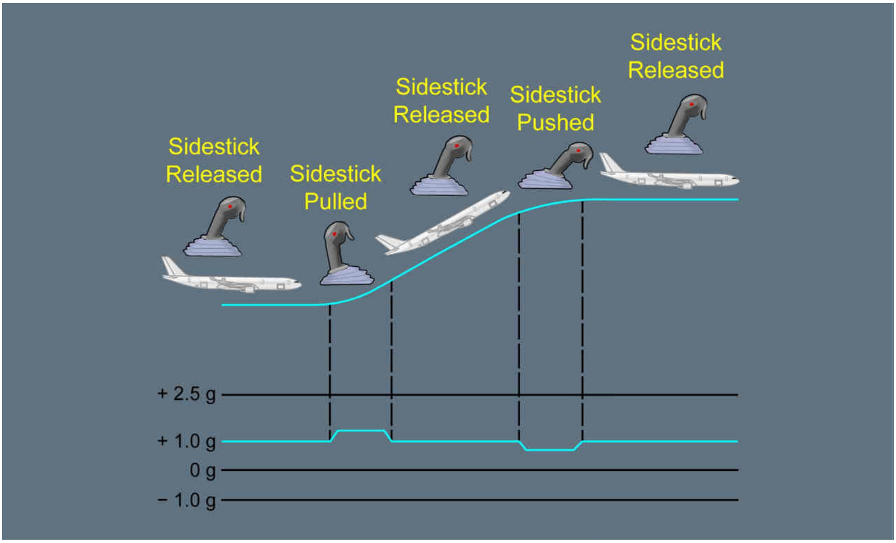
Applicable to: ALL

Ident.: DSC-27-20-10-20-A-00000271.0001001 / 17 MAR 17

GENERAL

The normal law flight mode is a load factor demand law with auto trim and full flight envelope protection.
In manual flight, it provides elevator and THS control from the sidestick controllers to achieve a load factor proportional to stick deflection, independent of speed.
With the sidestick at neutral and the wings level, the system maintains 1 g in pitch corrected for pitch attitude. There is no need for the pilot to trim with speed or configuration changes. Therefore pilots only need to perform minor corrections on the sidestick, if the aircraft deviates from its intended flight path. If the pilot senses an overcontrol, the sidestick should be released.

Airbus Pitch Characteristic



With the autopilot engaged, it provides elevator and THS control according to autopilot and load factor demand. Pitch trim is automatic in both manual and autopilot mode.
In normal turns (up to 33 ° of bank), no pitch correction is required once the turn is established.
The flight mode is active from takeoff to landing, according to the logic (*Refer to DSC-27-20-10-10 General*).

Automatic pitch trim is frozen in the following cases:
- Manual trim order
- Radio height below 100 ft for flare
- Load factor lower than 0.5 g
- In high speed protection.

When the angle of attack protection is active, the THS is limited between setting at entry in protection and 2 ° nose down (i.e. further nose up trim cannot be applied).
Similarly, when the load factor is higher than 1.3 g, or when the bank angle is outside ± 33 °, the THS is limited between the actual setting and 2 ° nose down.

Ident.: DSC-27-20-10-20-A-00000270.0001001 / 21 MAR 16

CONTROL WITH AUTOPILOT ENGAGED

- The autopilot orders are limited by the PRIM
- A force must be overcome to move the sidestick with the autopilot engaged. If the pilot moves the sidestick to overcome this force, the autopilot will disconnect.
- All protections remain effective.

FLARE MODE

Ident.: DSC-27-20-10-20-00000273.0001001 / 21 MAR 16
Applicable to: ALL

When the aircraft passes 100 ft RA, the THS is frozen and the normal flight mode changes to flare mode as the aircraft descends to land. Flare mode is essentially a direct stick-to-elevator relationship (with some damping provided by the load factor and the pitch rate feedbacks). At 50 ft, a slight pitch down elevator order is applied. Consequently, to flare the aircraft, a gentle nose-up action by the pilot is required.

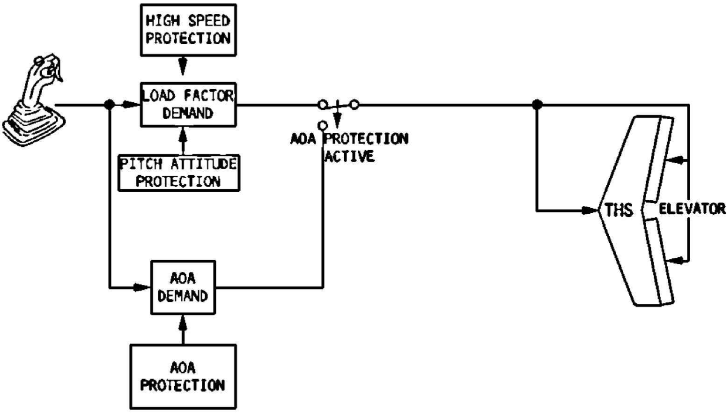
PROTECTIONS

Applicable to: ALL

Ident.: DSC-27-20-10-20-B-00000275.0001001 / 21 MAR 16

GENERAL

The normal law provides complete flight envelope protection as follow :
- Load factor limitation
- Pitch attitude protection
- High angle of attack (AOA) protection
- High speed protection


HIGH SPEED PROTECTION
LOAD FACTOR DEMAND
PITCH ATTITUDE PROTECTION
AOA PROTECTION ACTIVE
AOA DEMAND
AOA PROTECTION
THS
ELEVATOR

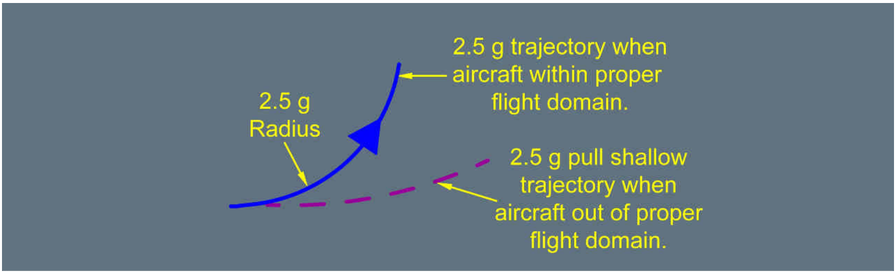
Ident.: DSC-27-20-10-20-B-00000276.0001001 / 17 MAR 17

LOAD FACTOR LIMITATION

On commercial aircraft, high load factors can be encountered during evasive maneuvers due to potential collisions, or CFIT …
Pulling "g" is efficient, if the resulting maneuver is really flown with this "g" number. If the aircraft is not able to fly this trajectory, or to perform this maneuver, pulling "g" will be detrimental.

The load factor is automatically limited to :
+2.5 g to -1 g, slats retracted
+2 g to 0, slats extended

Airbus Load Factor Protection and Safety


2.5 g trajectory when aircraft within proper flight domain.
2.5 g Radius
2.5 g pull shallow trajectory when aircraft out of proper flight domain.

On most commercial aircraft, the potential for an efficient 2.5 g maneuver is very remote. Furthermore, as G Load information is not continuously provided in the cockpit, airline pilots are not used to controlling this parameter. This is further evidenced by inflight experience, which

reveals that: In emergency situations, initial PF reaction on a yoke or sidestick is hesitant, then aggressive.
With load factor protection, the PF may immediately and instinctively pull the sidestick full aft: The aircraft will initially fly a 2.5 g maneuver without losing time. Then, if the PF still needs to maintain the sidestick full aft stick, because the danger still exists, then the high AOA protection will take over. Load factor protection enhances this high AOA protection.
Load factor protection enables immediate PF reaction, without any risk of overstressing the aircraft.
Flight experience has also revealed that an immediate 2.5 g reaction provides larger obstacle clearance, than a hesitant and delayed high G Load maneuver (two-second delay).

Ident.: DSC-27-20-10-20-B-00000278.0001001 / 17 MAR 17

PITCH ATTITUDE PROTECTION

Excessive pitch attitudes, caused by upsets or inappropriate maneuvers, lead to hazardous situations:

- Too high a nose-up ▸ Very rapid energy loss
- Too low a nose-down ▸ Very rapid energy gain

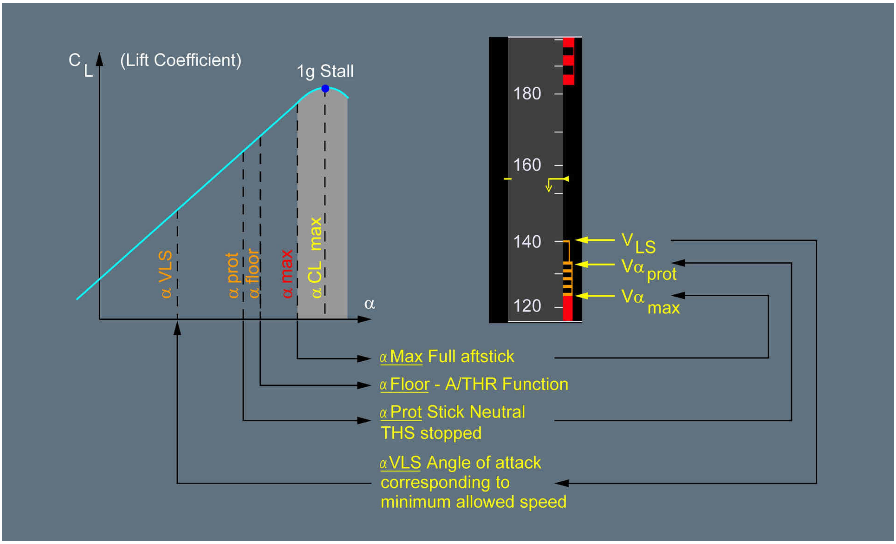
Furthermore, there is no emergency situation that requires flying at excessive attitudes. For these reasons, pitch attitude protection limits pitch attitude to plus 30 °/minus 15 °.
Pitch attitude protection enhances high speed protection, high load factor protection, and high AOA protection.

Ident.: DSC-27-20-10-20-B-00000280.0005001 / 04 MAY 23

HIGH ANGLE-OF-ATTACK PROTECTION

In normal law, the aircraft is protected against stall, in dynamic maneuvers or gusts. When the current angle-of-attack becomes greater than αPROT, the high angle-of-attack (AOA) protection activates.
Without the flight crew input, the F/CTL computers will maintain the angle-of-attack equal to αPROT. The AOA can be further increased by the flight crew input, up to a maximum value equals to αMAX. When the High AOA protection is activated, the normal law demand is modified and the side stick input is an angle-of-attack demand, instead of a load factor demand.
The PF must not deliberately fly the aircraft in the High AOA, except for brief periods, when the maximum maneuvering speed is required.

Airbus AOA Protection


C L
(Lift Coefficient)
1g Stall
α VLS
α prot
α floor
α max
α CL max
α
180
160
140
120
VLS
Vα prot
Vα max
α Max Full aftstick
α Floor - A/THR Function
α Prot Stick Neutral
THS stopped
α VLS Angle of attack
corresponding to
minimum allowed speed

Vα PROT, Vα MAX, and αfloor condition are mainly computed based on the AOA, and therefore they vary with configuration, weight and load factor. The Vα PROT and Vα MAX, displayed on the PFD, are computed by the PRIM. The αfloor activation logic is provided by the PRIM.
Refer to DSC-22_10-50-20 Characteristic Speeds for more information.
The angle-of-attach will not exceed αMAX, even if the flight crew gently pulls the sidesitck all way back. The flight crew can hold full back stick, if it is needed, and the aircraft stabilizes at an angle-of-attack close to but less of the 1 g stall. When flying at the αMAX, the PF can make gentle turns, if necessary. If the flight crew releases the sidestick, the angle-of-attack returns to the αPROT and stays there. As the aircraft enters the protection at the amber and blacks trip (αPROT), the system inhibits further nose-up trim beyond the point already reached. The nose-down trim remains available, if the flight crew pushes the stick forward.

Note: *At takeoff, the αPROT is equal to the αMAX for 8 s.*

This High AOA protection has priority over all other protections.
The aircraft can also enter αPROT at a high level, where it protects the aircraft from the buffet boundary. As at the low speed or low level, if the sidestick is merely released to neutral, the aircraft maintains the alpha for αPROT. This value of alpha is not the same as the value used at the low speed. The alpha for αPROT is reduced as a function of Mach, therefore, the aircraft may climb with the sidestick fee, when leaving a turn after entering αPROT.

If the flight crew flies into αPROT, the flight crew should leave it as soon as other considerations allow, by easing forward on the sidestick to reduce alpha below the value of αPROT, while simultaneously adding power (if the αfloor has not yet been activated, or has been cancelled).

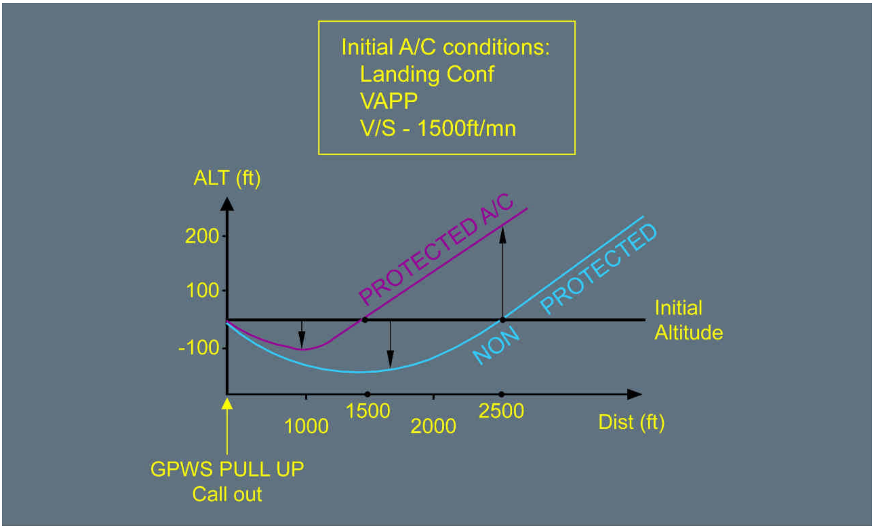
The aircraft leaves angle-of-attack protection when the:
- Sidestick is pushed more than 8 ° forward, or
- Sidestick is pushed more than 0 ° forward for at least 1 s, when α < αMAX, or
- The sidestick is at neutral or pushed forward, for at least 0.5 s, when α < αPROT.

Between αPROT and αMAX, the αfloor protection may automatically set go-around thrust. The αfloor will usually be triggered just after entering the αPROT, and go-around thrust will automatically be applied. Therefore, if the sidestick is held aft, either inadvertently or deliberately, the aircraft will start to climb at a relatively constant low airspeed. To recover a normal flight condition, the αPROT should be exited by easing forward on the sidestick, as described above, and the αfloor should be cancelled by using the disconnect pushbutton on either thrust lever as soon as a safe speed is regained. *Refer to DSC-22_30-50-50 ALPHA FLOOR* for more information.

GPWS/WINDSHEAR CASE:

In the case of application of GPWS or windshear procedures, the aircraft protections provide maximum lift / maximum thrust / minimum drag. Therefore, CFIT escape maneuvers will be much more efficient.

Protected A/C Versus Non-protected A/C Go-around Trajectory



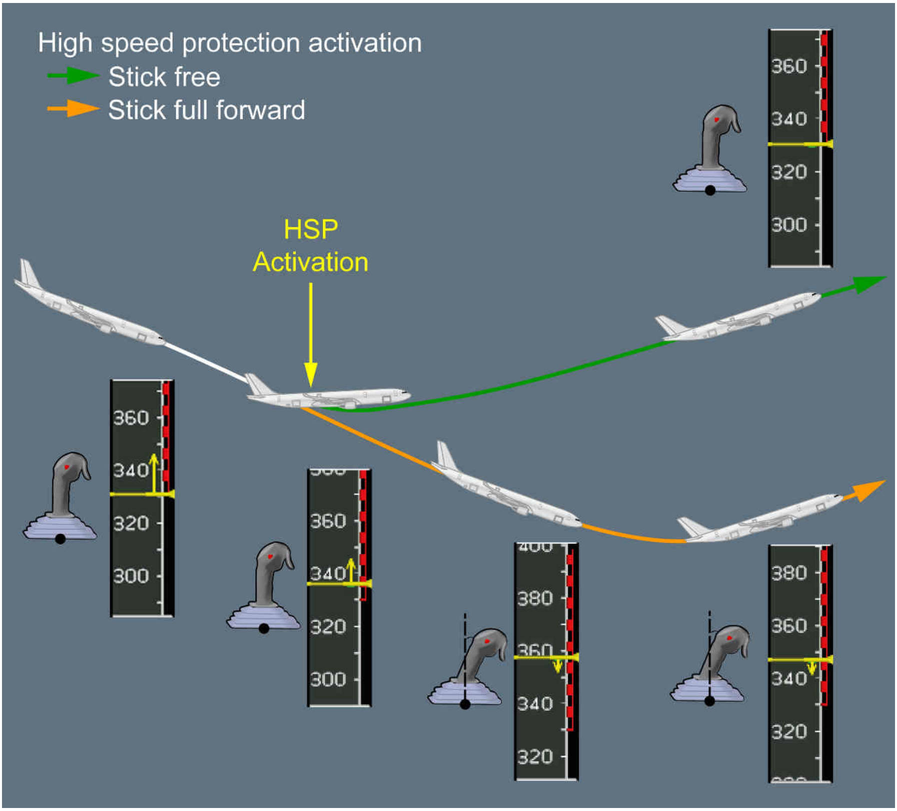
The above-illustrated are typical trajectories flown by protected or not protected aircraft, when the PF applies the escape procedure after an aural " GPWS PULL UP" alert.
The graph demonstrates the efficiency of the protection, to ensure a duck-under that is 50 % lower, a bucket-distance that is 50 % shorter, a safety margin that more than doubles (due to a quicker reaction time), and a significant altitude gain (± 250 ft). These characteristics are common to all protected aircraft, because the escape procedure is easy to achieve, and enables the PF to fly the aircraft at a constant AOA, close to the max AOA. It is much more difficult to fly the stick shaker AOA on an aircraft that is not protected.

Ident.: DSC-27-20-10-20-B-00000281.0001001 / 17 MAR 17

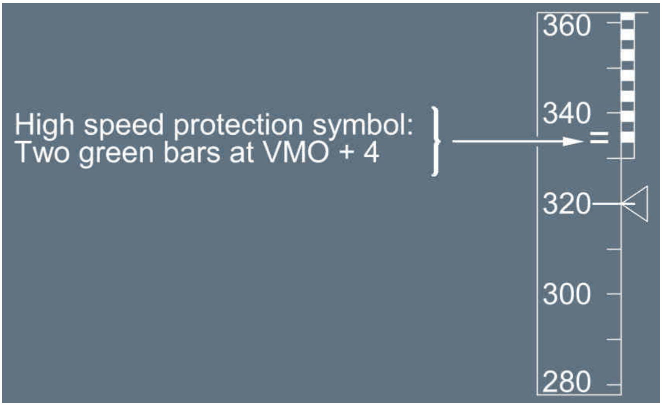
HIGH SPEED PROTECTION

The aircraft automatically recovers following a high speed upset. Depending on the flight conditions (high acceleration, low pitch attitude), the High Speed Protection is activated at/or above VMO/MMO.
When it is activated, the pitch trim is frozen. Positive spiral static stability is introduced to 0 ° bank angle (instead of 33 ° in normal law), so that with the sidestick released, the aircraft always returns to a bank angle of 0 °. The bank angle limit is reduced from 67 ° to 45 °.
As the speed increases above VMO/MMO, the sidestick nose-down authority is progressively reduced, and a permanent nose-up order is applied to aid recovery to normal flight conditions.

Therefore, in a dive situation:
- If there is no sidestick input, the aircraft will slightly overshoot VMO/MMO and fly back towards the envelope.
- If the sidestick is maintained full forward, the aircraft will significantly overshoot VMO/MMO. At approximately VMO +16/MMO +0.04, the pitch nose-down authority smoothly reduces to zero (which does not mean that the aircraft stabilizes at that speed).


High speed protection activation
Stick free
Stick full forward
HSP
Activation
360
340
320
300
380
400

The PF, therefore, has full authority to perform a high speed/steep dive escape maneuver, when required, via a reflex action on the sidestick.
The High Speed Protection is deactivated when the aircraft speed decreases below VMO/MMO, where the usual normal control laws are recovered.
The autopilot disconnects at VMO +12 kt and MMO + 0.03.



Note: *1. An OVERSPEED ECAM warning is provided at VMO + 4 kt and MMO + 0.006.*
2. At high altitude, this may result in activation of the angle of attack protection.

Ident.: DSC-27-20-10-20-B-00000282.0001001 / 17 MAR 17

LOW ENERGY AURAL ALERT

A low energy aural alert “SPEED SPEED SPEED” repeated every 5 s indicates to the pilot that the aircraft energy becomes lower than a threshold under which to recover a positive flight path angle through pitch control, the thrust must be increased.
It is available in configuration 2, 3 and full between 100 and 2 000 ft.

For example, if the aircraft decelerates at 1 kt/sec, and:
- The FPA is -3 °, the alert will trigger at approximately VLS -8,
- The FPA is -4 °, the alert will trigger at approximately VLS -2.

This alert draws the PF's attention to the SPEED scale, and indicates the need to adjust thrust.
It comes immediately before the ALPHA Floor.

The low energy aural alert is computed by the PRIM's from the following inputs:
- Aircraft configuration
- Air speed deceleration rate
- Flight path angle

It is inhibited when:
- TOGA is selected
- Below 100 ft RA
- Above 2 000 ft RA
- Alpha floor or GPWS alert is triggered

- In alternate or direct law
- If both RA are failed

The low energy aural alert is triggered during deceleration before alpha floor (unless alpha floor is triggered by stick deflection), the delay between the two alerts depends on deceleration rate.

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Lateral Control

LATERAL NORMAL LAW

Ident.: DSC-27-20-10-30-00000312.0002001 / 03 NOV 23
Applicable to: ALL

When the aircraft is on ground, the sidestick commands the aileron and the deflection of the roll spoiler surfaces deflection. The amount of control surface deflection that results from a given amount of sidestick deflection depends on the aircraft speed. The pedals control rudder deflection. The aircraft smoothly transitions to flight mode shortly after liftoff.
When the aircraft is in the flight mode, normal law combines the controls of the ailerons, spoilers (except spoilers 1), and rudder (for turn coordination) in the sidestick. The flight crew does not need to use rudder for turn coordination purpose. While in manual flight the flight crew controls the roll and heading, the flight control system automatically limits the roll rate and the bank angle, ensures turn coordination and damps the dutch roll.
The roll rate requested by the flight crew during flight is proportional to the sidestick deflection, with a maximum rate of 15 °/s when the sidestick is in full deflection. When the aircraft is in flare mode, the lateral control is the same as in flight mode.
During decrab phase, the aircraft limits the induced roll after pedal input, in order to ease flight crew control.
After touchdown, the aircraft smoothly transitions from flight mode to ground mode.

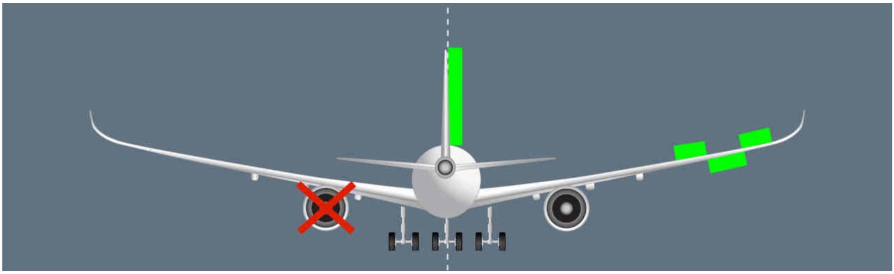
ENGINE FAILURE AT TAKEOFF

In the case of an engine failure during takeoff, the spoiler 6 and ailerons can be deflected on the wing opposite to the failed engine in order to increase yaw efficiency.

Note: *Increasing yaw efficiency in the case of an engine failure on ground, reduces the VMCG, and therefore increases the takeoff performance.*

L2 The spoiler 6 and ailerons will be deflected when:
- Pedal order is more than 2/3 of full pedal deflection
- The aircraft is on ground
- The pitch attitude is below 2.5 °
- The speed is above 60 kt
- Ground spoilers are not activated.

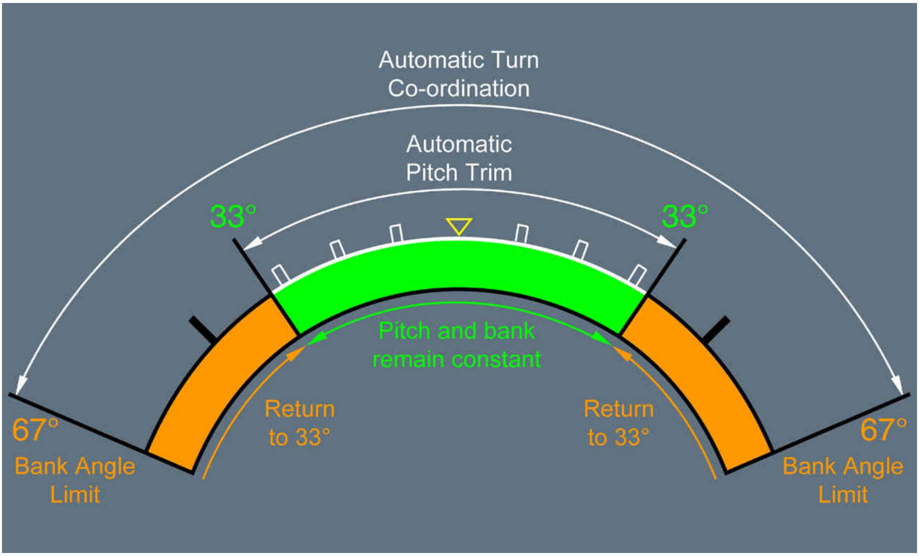
Engine failure at takeoff



BANK ANGLE PROTECTION

Ident.: DSC-27-20-10-30-00000313.0002001 / 17 MAR 17
Applicable to: ALL

Inside the normal flight envelope, the system maintains positive spiral static stability for bank angles above 33 °. If the pilot releases the sidestick at a bank angle greater than 33 °, the bank angle automatically reduces to 33 °. Up to 33 °, the system holds the roll attitude constant when the sidestick is at neutral. If the pilot holds full lateral sidestick deflection, the bank angle goes to 67 ° and no further.


Automatic Turn
Co-ordination
Automatic
Pitch Trim
33°
33°
Pitch and bank
remain constant
Return
to 33°
Return
to 33°
67°
Bank Angle
Limit
67°
Bank Angle
Limit

During a normal turn (bank angle less than 33 °), in level flight:
- The PF moves the sidestick laterally (the more the sidestick is moved laterally, the greater the resulting roll rate - e.g. 15 °/s at max deflection)
- It is not necessary to make a pitch correction
- It is not necessary to use the rudder.

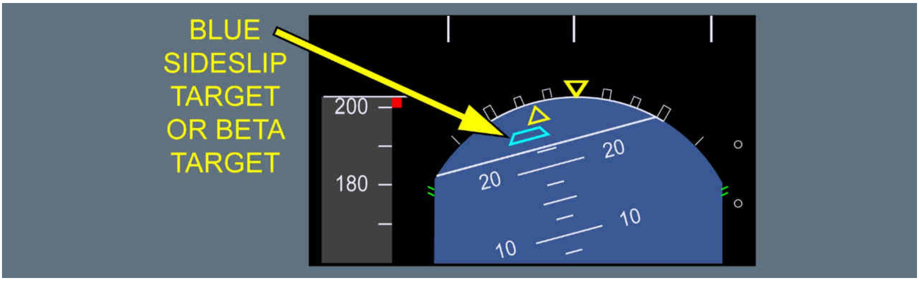
In the case of steep turns (bank angle greater than 33 °), the PF must apply:
- Lateral pressure on the sidestick to maintain bank
- Aft pressure on the sidestick to maintain level flight.

If angle-of-attack protection, or high speed protection, or negative pitch attitude protection is operative, the bank angle will not go beyond 45 °, when the pilot maintains full lateral deflection on the sidestick. If high speed protection is operative, the system maintains positive spiral static stability from a bank angle of 0 °, so that with the sidestick released, the aircraft always returns to a bank angle of 0 °.
When bank angle protection is active, auto trim is inoperative.
If the bank angle exceeds 45 °, the autopilot disconnects and the FD bars disappear. The FD bars return when the bank angle decreases to less than 40 °.

SIDESLIP TARGET

Ident.: DSC-27-20-10-30-00000314.0001001 / 17 MAR 17
Applicable to: ALL

Should an engine failure occur, the sideslip indication is slightly modified to ensure that optimum pilot rudder application is made to achieve optimum climb performance (ailerons to neutral and spoilers retracted).
In the case of an engine failure at takeoff, or at go-around, the sideslip index on the PFD changes from yellow to blue (*Refer to DSC-31-40 Attitude Data* that provides the conditions for the blue display of the sideslip target).



In flight, the lateral normal law commands some rudder surface deflection to minimize the sideslip.

Crew response is normal and instinctive:
- Zero, the beta target value for optimum performance with appropriate rudder application
- Accelerate if beta target cannot be zeroed with full rudder.

The computation is made by the PRIM.

Maneuver Load Alleviation (MLA)

MANEUVER LOAD ALLEVIATION (MLA)

Ident.: DSC-27-20-10-40-00000320.0001001 / 21 MAR 16
Applicable to: ALL

The purpose of MLA is to redistribute the lift over the wing to relieve structural loads on the outer wing surfaces (bending moment).
The demanded load factor is maintained.
MLA utilises spoilers 4, 5, and 6 and the ailerons.

The MLA becomes active when the sidestick is pulled more than 8 °, and the load factor is more than 2 g, in which case :
- The ailerons are symmetrically-deflected upwards :
  - Maximum of 11 ° is added to roll demand, if any.
- Spoilers 4, 5, 6 are symmetrically-deflected :
  - Maximum of 9 ° is added to roll demand, if any.
  - Deflection is proportional to load factor, in excess of 2 g.
- An elevator demand is simultaneously applied to compensate for the pitching moment induced by spoilers and ailerons.

The load alleviation is only available, when :
- The aircraft speed is above 250 kt.
- The FLAPS lever is in the 0 position.
- In normal or alternate law flight mode.

The MLA has priority over the speedbrakes.

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Turbulence Damping Function

TURBULENCE DAMPING FUNCTION

Ident.: DSC-27-20-10-60-00000322.0001001 / 21 MAR 16
Applicable to: ALL

The purpose of the turbulence damping function is to damp the structural modes induced by atmosphere turbulence.
The function uses the Nz accelerometer and two dedicated Ny accelerometers. The PRIMs compute a turbulence damping command, which is added to the normal law command for the elevator and the yaw damper.
This function is automatically monitored and becomes inoperative for the remainder of the flight, when a failure is detected. In addition, it may be manually inhibited by switching off the TURB DAMP pushbutton on the overhead panel, when it is considered that comfort is degraded instead of being improved, and no failure is detected.

It is only available if the following conditions are met :
- Aircraft in flight.
- Aircraft speed greater than 200 kt.
- Autopilot engaged or normal law active.
- Aircraft within the normal flight envelope.

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Enhanced Load Alleviation Function (ELAF)

ENHANCED LOAD ALLEVIATION FUNCTION (ELAF)

Ident.: DSC-27-20-10-70-00016092.0001001 / 24 FEB 15
Applicable to: LV-GHQ, LV-GIF

The enhanced load alleviation function permits to alleviate the wing structure loads.
The function is achieved through the upward deflection of the two pairs of ailerons only.

The ELAF is activated:
- when airbrakes are extended, or
- In case of turbulence when load factor variation rate is excessive.

The ELAF is available when the aircraft is in clean configuration and in Normal law. The ELAF orders are added to those generated by the normal law.

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Aircraft Trimming

GENERAL

Ident.: DSC-27-20-10-80-00001960.0002001 / 10 DEC 09
Applicable to: ALL

When the aircraft is :
- In normal cruise range,
- In straight flight,
- With the autopilot engaged,
- With symmetrical engine thrust, and
- With fuel in the wing tanks distributed symmetrically,

the rudder trim should stay between 1.9 ° right and 1.6 ° left.

Note: *This indication corresponds to a true rudder deflection within ± 1 °, taking into account the permanent offset of rudder trim indication when the aircraft is in cruise conditions (0.9 ° right, 0.6 ° left).*

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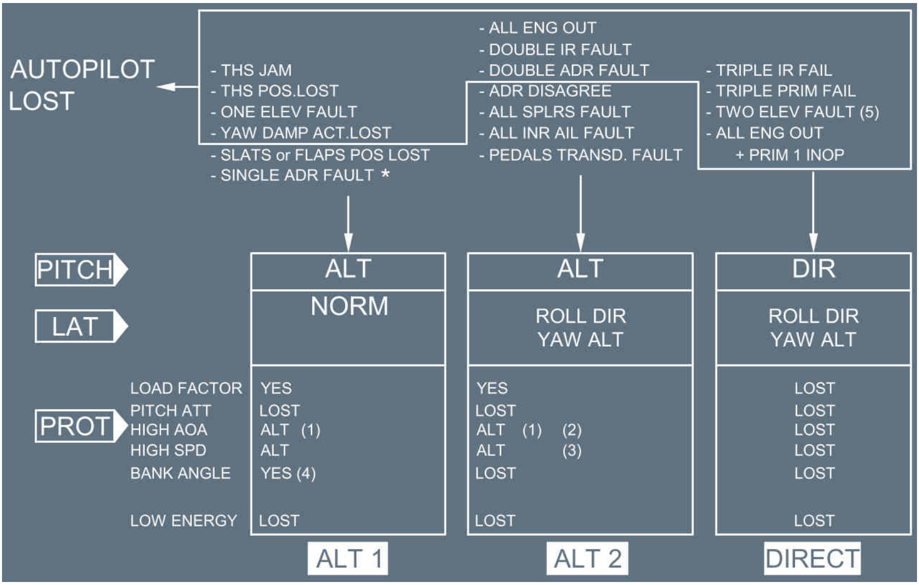
General

GENERAL

Ident.: DSC-27-20-20-10-00000324.0001001 / 17 MAR 17
Applicable to: ALL

Depending on the type of failures affecting the flight control system, or its peripherals, there are 3 possible reconfiguration levels:
- Alternate law (ALT 1 or ALT 2)
- Direct law, or
- Mechanical.


AUTOPILOT LOST
- THS JAM
- THS POS.LOST
- ONE ELEV FAULT
- YAW DAMP ACT.LOST
- SLATS or FLAPS POS LOST
- SINGLE ADR FAULT *
- ALL ENG OUT
- DOUBLE IR FAULT
- DOUBLE ADR FAULT
- ADR DISAGREE
- ALL SPLRS FAULT
- ALL INR AIL FAULT
- PEDALS TRANSD. FAULT
- TRIPLE IR FAIL
- TRIPLE PRIM FAIL
- TWO ELEV FAULT (5)
- ALL ENG OUT
+ PRIM 1 INOP
PITCH
LAT
PROT
ALT
NORM
ALT
ROLL DIR
YAW ALT
DIR
ROLL DIR
YAW ALT
LOAD FACTOR
PITCH ATT
HIGH AOA
HIGH SPD
BANK ANGLE
LOW ENERGY
YES
LOST
ALT (1)
ALT
YES (4)
LOST
YES
LOST
ALT (1) (2)
ALT (3)
LOST
LOST
LOST
LOST
LOST
LOST
LOST
LOST
ALT 1
ALT 2
DIRECT

(*) Only in case the AOA, of the remaining ADRs, disagrees with the AOA (as computed by the PRIM's).

(1) Protection is totally lost, in case of VS 1g computation failure (loss of weight, or slat/flap position).

(2) Protection is lost, in case of a dual ADR failure (or ADR DISAGREE).

(3) Protection is lost, in case of a triple ADR failure (or ADR DISAGREE).

(4) Bank angle limitation remains effective in ALT 1, which uses roll normal.
However, since ALT 1 is generally an unprotected law, all protection marks on the PFD are in amber for simplicity.

(5) When both elevators have failed, only pitch mechanical backup is available, by using the manual pitch trim (THS). “MAN PITCH TRIM ONLY” is displayed in red on the PFDs.

Note: 1. *In case of dual RA failure, flare law is introduced when the landing gear is extended and both autopilots are disengaged. The specific normal law pitch down effect at 50 ft no longer applies.*
2. *A jerk may be felt, in the case of flight control computers reconfiguration (due to hydraulic failure, computer failure, electrical transient...).*

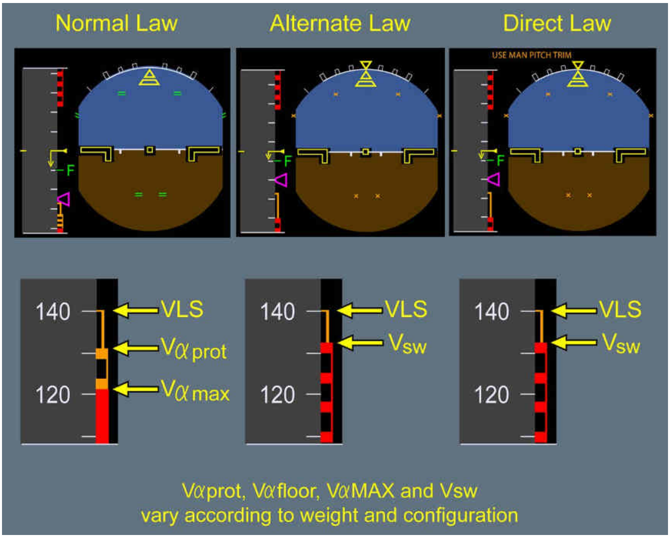
INDICATIONS ON THE ECAM

- **In ALTN Law:**
  FLT CTL ALTN LAW (PROT LOST)
  A330 : MAX SPEED 330 kt/M 0.82
  A340 : MAX SPEED 305 kt/M 0.82
- **In Direct Law:**
  FLT CTL DIRECT LAW (PROT LOST)
  A330 : MAX SPEED 330 kt/M 0.80
  A340 : MAX SPEED 305 kt/M 0.80
  MAN PITCH TRIM USE

INDICATIONS ON THE PFD

The PFD enhances the flight crew's awareness of the status of flight controls
Specific symbols, and specific formatting of low speed information on the speed scale in normal law, indicate which protection are available.
When protections are lost, amber crosses (X) appear, instead of the green protection symbols (=).
When automatic pitch trim is no longer available, the PFD indicates this with an amber "USE MAN PITCH TRIM" message below the FMA.

Fly-by-Wire Status Awareness via the PFD


Normal Law
Alternate Law
Direct Law
USE MAN PITCH TRIM
F
140
120
VLS
Vα prot
Vα max
Vsw

Vαprot, Vαfloor, VαMAX and Vsw vary according to weight and configuration

Therefore, by simply looking at this main instrument (PFD), the flight crew is immediately aware of the status of flight controls, and the operational consequences.

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Alternate Law

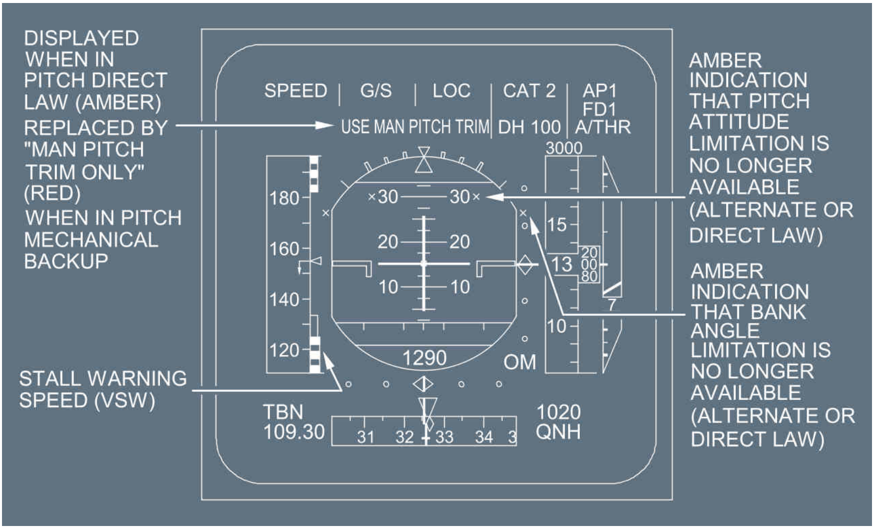
ABNORMAL CONTROL LAWS - IN DETAIL-ALTERNATE LAW

Ident.: DSC-27-20-20-20-00001949.0004001 / 22 APR 16
Applicable to: ALL

ALTERNATE LAW

PITCH

Alternate law in pitch is almost the same for the pilot, as normal control law.
However, alternate law does not maintain any of the protections, except maneuver protection.
As a result, the pilot must fly the aircraft more attentively to avoid inadvertently exceeding the normal limits.
Alternate law reduces MMO to0.82.


DISPLAYED WHEN IN PITCH DIRECT LAW (AMBER) REPLACED BY "MAN PITCH TRIM ONLY" (RED) WHEN IN PITCH MECHANICAL BACKUP
SPEED
G/S
LOC
CAT 2
AP1
FD1
USE MAN PITCH TRIM
DH 100
A/THR
3000
180
160
140
120
30
30
20
20
10
10
15
13
20
00
80
7
10
1290
OM
TBN
109.30
31
32
33
34
1020
QNH
AMBER INDICATION THAT PITCH ATTITUDE LIMITATION IS NO LONGER AVAILABLE (ALTERNATE OR DIRECT LAW)
AMBER INDICATION THAT BANK ANGLE LIMITATION IS NO LONGER AVAILABLE (ALTERNATE OR DIRECT LAW)
STALL WARNING SPEED (VSW)

At low speed, the change in the speed scale is very noticeable. VLS remains, but Vα PROT and Vα MAX disappear, replaced by a single black and red strip, the top of which is stall warning speed. Unlike VLS, which is stable, VSW is g sensitive so as to give additional margin in turns.
As mentioned above, ALTERNATE reverts to FLARE law for landing at 100 ft.

ROLL

Roll control is direct. The roll rate is generally higher than with normal law and, at first, the aircraft appears to be very sensitive.

Bank stability and limits are no longer active, and the flight crew should be careful to remain within normal limits.

ALT 1

Ident.: DSC-27-20-20-20-A-00000329.0002001 / 21 MAR 16
Applicable to: ALL

PITCH CONTROL

GROUND MODE

Identical to normal law ground mode.

FLIGHT MODE

Flight law is a load factor demand law, similar to normal law, with limited pitch rate feedback and gains, depending on the speed and configuration.

FLARE MODE

Flare law is identical to normal flare law.

Ident.: DSC-27-20-20-20-A-00000330.0001001 / 21 MAR 16
Applicable to: ALL

LATERAL CONTROL

Lateral control is similar to normal law, except that alterations of positive spiral static stability will not occur due to the loss of high AOA and high speed protection.

Ident.: DSC-27-20-20-20-A-00000331.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

PROTECTIONS

LOW SPEED STABILITY

At low speed, a nose down demand is introduced in reference to IAS, instead of angle of attack, and alternate law changes to direct law.
It is available, whatever the slats/flaps configuration, and it is active from about 5 kt up to about 10 kt above the stall warning speed, depending on the aircraft's weight and slats/flaps configuration.
A gentle progressive nose down signal is introduced, which tends to keep the speed from falling below these values. The pilot can override this demand.
Bank angle compensation is provided.
In addition, aural stall alert (“STALL, STALL” synthetic voice then cricket) is triggered at an appropriate margin from the stall condition.
The PFD speed scale is modified to show a black/red barber pole below the stall warning.
Vα prot and Vα max are replaced by Vsw (stall warning speed).

The α floor protection is inoperative.

HIGH SPEED STABILITY

Above VMO/MMO, a nose up demand is introduced to avoid an excessive increase in speed.
The pilot can override this demand.
The high speed protection symbol (VMO + 4) disappears.
In addition, the overspeed warning (VMO + 4 or MMO + 0.006) remains available.

PITCH ATTITUDE PROTECTION

Lost.

Ident.: DSC-27-20-20-20-A-00000331.0002001 / 09 OCT 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

PROTECTIONS

LOW SPEED STABILITY

At low speed, a nose down demand is introduced in reference to IAS, instead of angle of attack, and alternate law changes to direct law.
It is available, whatever the slats/flaps configuration, and it is active from about 5 kt up to about 10 kt above the stall warning speed, depending on the aircraft's weight and slats/flaps configuration.
A gentle progressive nose down signal is introduced, which tends to keep the speed from falling below these values. The pilot can override this demand.
Bank angle compensation is provided.
In addition, stall alerts (“STALL, STALL” synthetic voice then cricket and "STALL STALL" red message on PFD) are triggered at an appropriate margin from the stall condition.
The PFD speed scale is modified to show a black/red barber pole below the stall warning.
Vα prot and Vα max are replaced by Vsw (stall warning speed).
The α floor protection is inoperative.

HIGH SPEED STABILITY

Above VMO/MMO, a nose up demand is introduced to avoid an excessive increase in speed.
The pilot can override this demand.
The high speed protection symbol (VMO + 4) disappears.
In addition, the overspeed warning (VMO + 4 or MMO + 0.006) remains available.

PITCH ATTITUDE PROTECTION

Lost.

ALT 2

Applicable to: ALL

Ident.: DSC-27-20-20-20-B-00000343.0001001 / 21 MAR 16

PITCH CONTROL

Identical to ALT 1 law.

Ident.: DSC-27-20-20-20-B-00000344.0001001 / 21 MAR 16

LATERAL CONTROL

ROLL DIRECT LAW

Provides a direct stick-to-surface position relationship. The gains are automatically set according to the slats/flaps configuration.
The maximum roll rate is approximately 20 to 25 °/s, depending on the speed and configuration.
Spoilers 2, 3 and 6 are inhibited, except in case of some additional failures affecting the lateral control.

YAW ALTERNATE LAW

The dutch roll damping function is available, and damper authority is limited to ± 4 ° rudder (CONF 0) and ± 15 ° (other configuration).
Turn coordination is also provided, except in CONF 0.

Ident.: DSC-27-20-20-20-B-00000345.0001001 / 21 MAR 16

PROTECTIONS

Identical to protections in ALT 1, except that :

1. There is no bank angle protection in ALT 2 law.
2. In case of failure of 2 ADRs, there is no low speed stability.
3. In case of failure of 3 ADRs, there is no high speed stability.

Direct Law

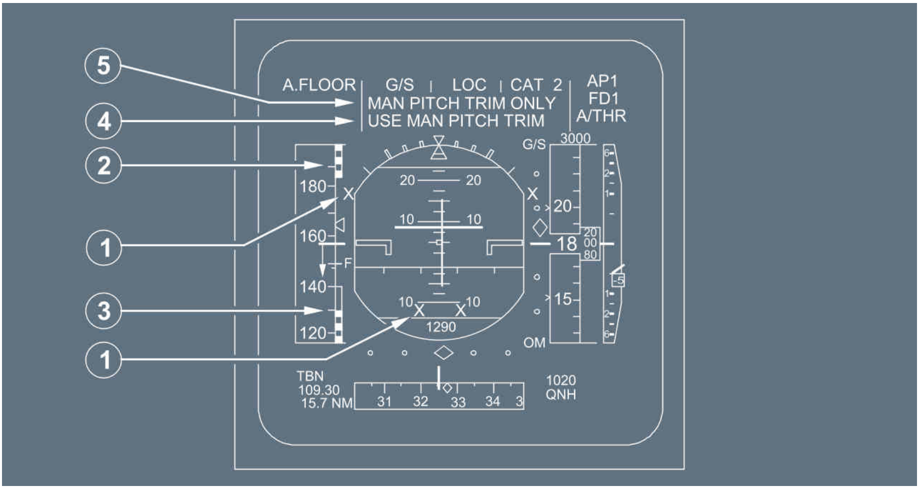
GENERAL

Ident.: DSC-27-20-20-30-00000353.0001001 / 21 MAR 16
Applicable to: ALL

Pitch direct law is a direct stick to elevator relationship (elevator deflection is proportional to stick deflection).
In all configurations, the maximum elevator deflection varies as a function of the CG.
It is a compromise between the adequate controllability at forward CG, and the not-so-sensitive controllability at aft CG.
As there is no automatic trim, the pilot has to use manual trim.
The "USE MAN PITCH TRIM" amber message is displayed on the PFD.
All protections are inoperative.
The α floor function is inoperative.
As per alternate law, overspeed and stall warnings are available.

RECONFIGURATION CONTROL LAWS - PFD DISPLAY

Ident.: DSC-27-20-20-30-00000354.0003001 / 22 MAY 12
Applicable to: ALL


5
4
2
1
3
1
A.FLOOR
G/S
LOC
CAT 2
AP1
FD1
A/THR
MAN PITCH TRIM ONLY
USE MAN PITCH TRIM
G/S
3000
180
160
140
120
F
20
10
X
20
18
15
OM
1290
TBN
109.30
15.7 NM
31
32
33
34
1020
QNH

(1) Bank angle and pitch limitation is replaced by an amber X.

(2) Overspeed protection symbol (=) disappears.

(3) Vα prot and Vα max are replaced by Vsw.

(4) USE MAN PITCH TRIM (amber) displayed in direct law, or in flare law without RA.

(5) MAN PITCH TRIM ONLY (red) displayed, if a L + R elevator fault is detected.

Abnormal Attitude Laws

GENERAL

Ident.: DSC-27-20-20-40-00000360.0007001 / 03 MAY 23
Applicable to: ALL

If for any reason the aircraft goes far outside the normal flight envelope and reaches an extreme attitude, the flight control law will be modified.
The abnormal attitude law will engage and will provide the PF with maximum efficiency to recover normal attitude.

The abnormal attitude law engages when one of the following values is reached:
- If at least 2 ADCs are valid and consistent: Pitch attitude above 50 ° nose up or below 30 ° nose down.
  If not: Pitch attitude above 40 ° nose up or below 20 ° nose down
- Bank angle is above 125 °
- Angle of attack is above 40 °
- Speed is above 440 kt or below 60 kt
- Mach is above 0.96 or below 0.1.

When the abnormal attitude law engages:
- The pitch alternate law is active
- The roll direct law is active
- The yaw mechanical law is active
- Autotrim is not available. Therefore, USE MAN PITCH TRIM is displayed on the PFDs, and
- F/CTL ALTN LAW is displayed on the ECAM.

When the aircraft returns within the normal flight envelope, the abnormal attitude law disengages and the following conditions remains for the remainder of the flight:
- The pitch alternate law is active with autotrim
- The roll direct law is active
- The yaw alternate law is active
- F/CTL ALTN LAW is displayed on the ECAM.

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Mechanical Back Up

GENERAL

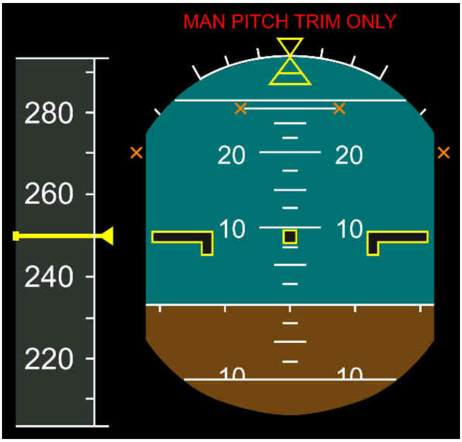
Ident.: DSC-27-20-20-50-00000361.0001001 / 17 MAR 17
Applicable to: ALL

The purpose of the backup is to achieve all safety objectives in MMEL dispatch condition: To manage a temporary and total electrical loss, the temporary loss of five fly-by-wire computers, the loss of both elevators, or the total loss of ailerons and spoilers.
It must be noted that it is very unlikely that the backup will be used, due to the fly-by-wire architecture. For example, in case of electrical emergency configuration, or an all-engine flameout, alternate law remains available.

PITCH

Ident.: DSC-27-20-20-50-00000362.0001001 / 17 MAR 17
Applicable to: ALL

Pitch mechanical control is achieved through the THS, using manual trim control.
«MAN PITCH TRIM ONLY» is displayed in red on the PFDs.



LATERAL

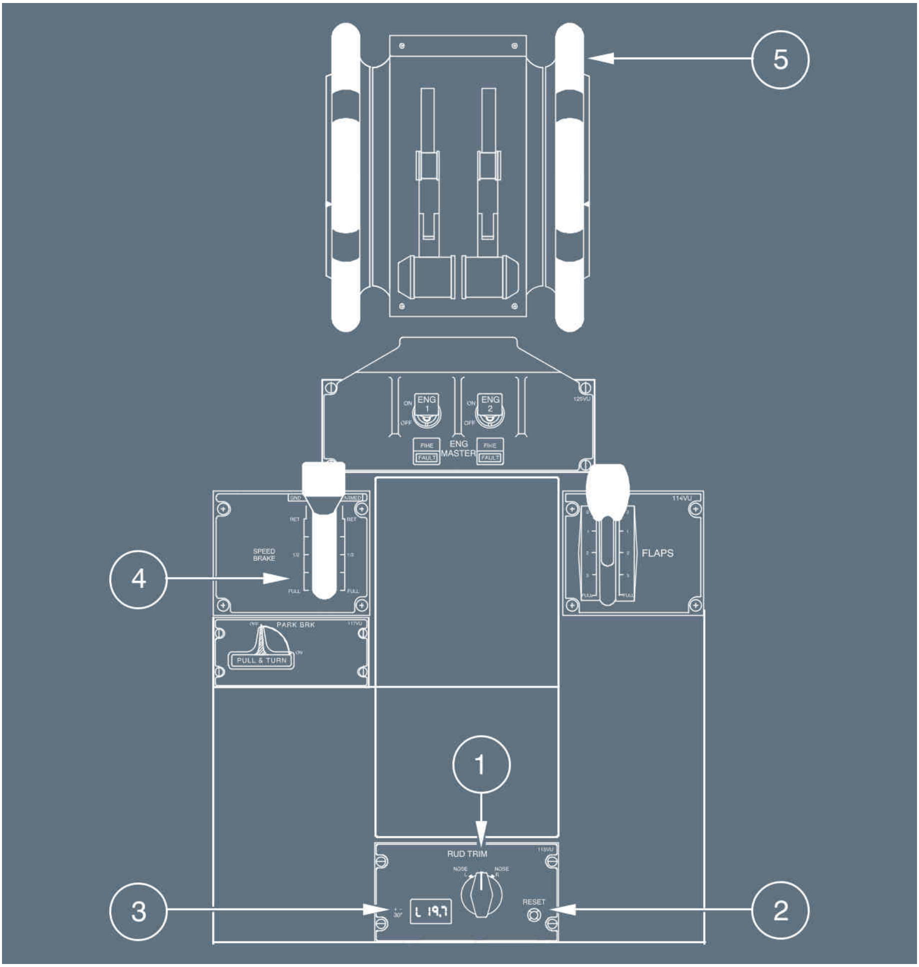
Ident.: DSC-27-20-20-50-00000363.0002001 / 21 MAR 16

Applicable to: ALL

The Backup Control Module (BCM) computer provides yaw damping and direct rudder command with pedals. This computer includes its own electrical generator, supplied by the B or Y hydraulic system.

PEDESTAL

Ident.: DSC-27-20-30-00000371.0002001 / 15 SEP 15
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO


5
ON
ENG 1
OFF
ON
ENG 2
OFF
125VU
FIRE
FAULT
ENG
MASTER
FIRE
FAULT
GND
ARMED
RET
SPEED BRAKE
1/2
FULL
4
PARK BRK
OFF
ON
PULL & TURN
117VU
114VU
0
1
2
3
FULL
FLAPS
1
RUD TRIM
115VU
NOSE L
NOSE R
L 19.7
30°
RESET
3
2

(1) RUD TRIM selector
Controls the rudder trim actuator, which moves the neutral point of the artificial feel by an equivalent of :

In clean configuration	:	1 °/s of rudder travel
Slats/flaps extended	:	1 °/s of rudder travel for quick inputs 3 °/s for inputs longer than 1.5 s

(2) RESET pb

By pushing the RESET pb, the zero trim position is ordered at 3 °/s.
After the reset, an indication of up to 0.6° (L or R) may be observed in the rudder trim position indication.

Note: The rudder trim rotary switch, and the RESET pb, are not active with autopilot engaged.

(3) RUD TRIM Position Indicator

Displays rudder trim direction (L or R) and value (0 to 25 °).

(4) SPEEDBRAKE lever

Controls:

- The position of the speedbrake surfaces.
  To set speedbrake surfaces to a required position, the speedbrake lever has to be pushed down and set to the required position. A “hardpoint” is provided at “½” SPEEDBRAKE position.
- The manual preselection of the ground spoilers.
  To arm the ground spoilers, the lever must be pulled up when in the RET position.
  When the lever is armed (or reverse thrust is selected), all spoilers' surfaces will automatically extend at landing, or in case of a rejected takeoff.

(5) PITCH TRIM wheel

Both pitch trim wheels provide mechanical control of the THS and have priority over electrical control.

Note: Crew action on the pitch trim wheel does not disconnect the PRIMs (micro-switches, actuated by the override mechanism, ensure that the computers remain synchronized with the manually-selected position).

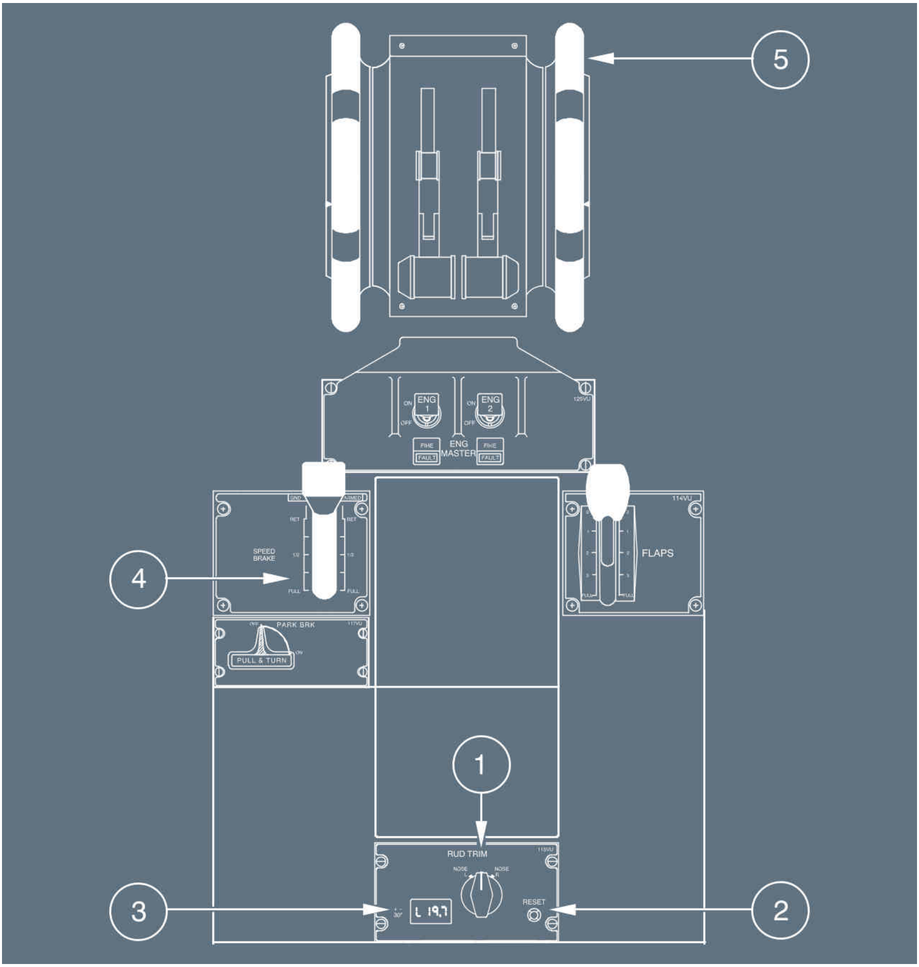
The THS is manually-controlled on ground for the THS setting, before takeoff, and in flight, when in direct law:

- Before takeoff, the pilot sets the THS to the angular value, determined as a function of the aircraft CG, using the CG scale on the wheel. The relationship between the aircraft CG and the THS setting on the trim wheel is only applicable for takeoff. The limits of the THS normal setting range for takeoff are indicated by a green band on the pitch trim wheel.
- In flight, when in direct law, the pilot uses the THS conventionally to fly in trim. In flight, the aircraft pitch trim setting depends on the aircraft CG, weight, altitude and speed. As the result, the relation between the aircraft CG, and the THS setting displayed on the pitch trim wheel, does not apply in flight.

After nosewheel touchdown, when the pitch attitude becomes less than 2.5 ° for more than 5 s, and the ground spoilers are retracted, pitch trim is automatically reset to 4 ° UP.

PEDESTAL

Ident.: DSC-27-20-30-00000371.0005001 / 15 SEP 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU


5
ENG 1
ENG 2
ON
OFF
FIRE
FAULT
ENG MASTER
125VU
GND
ARMED
RET
SPEED BRAKE
1/2
FULL
4
PARK BRK
OFF
ON
PULL & TURN
117VU
114VU
FLAPS
0
1
2
3
FULL
1
RUD TRIM
115VU
NOSE L
NOSE R
30°
L 19.7
RESET
3
2

(1) RUD TRIM selector
Controls the rudder trim actuator, which moves the neutral point of the artificial feel by an equivalent of :

In clean configuration	:	1 °/s of rudder travel
Slats/flaps extended	:	1 °/s of rudder travel for quick inputs 3 °/s for inputs longer than 1.5 s

(2) RESET pb

By pushing the RESET pb, the zero trim position is ordered at 3 °/s.
After the reset, an indication of up to 0.6° (L or R) may be observed in the rudder trim position indication.

Note: The rudder trim rotary switch, and the RESET pb, are not active with autopilot engaged.

(3) RUD TRIM Position Indicator

Displays rudder trim direction (L or R) and value (0 to 25 °).

(4) SPEEDBRAKE lever

Controls:

- The position of the speedbrake surfaces.
  To set speedbrake surfaces to a required position, the speedbrake lever has to be pushed down and set to the required position. A "hardpoint" is provided at "½" SPEEDBRAKE position.
- The manual preselection of the ground spoilers.
  To arm the ground spoilers, the lever must be pulled up when in the RET position. When the lever is armed (or reverse thrust is selected), all spoilers' surfaces will automatically extend at landing, or in case of a rejected takeoff.

(5) PITCH TRIM Wheel

Both pitch trim wheels provide mechanical control of the THS and have priority over electrical control.

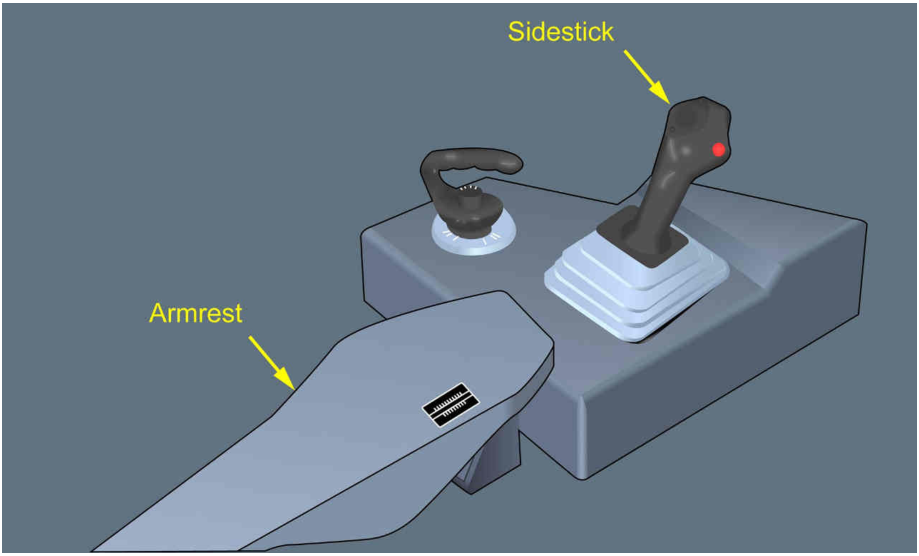
Note: Crew action on the pitch trim wheel does not disconnect the PRIMs (micro-switches, actuated by the override mechanism, ensure that the computers remain synchronized with the manually-selected position).

The THS is automatically controlled on ground for THS setting, before takeoff. The flight crew can also manually control the THS on ground, and in flight when in direct law.
- Before takeoff, the pilot sets the THS to the angular value, determined as a function of the aircraft CG, using the CG scale on the wheel. The relationship between the aircraft CG and the THS setting on the trim wheel is only applicable for takeoff. The limits of the THS normal setting range for takeoff are indicated by a green band on the pitch trim wheel.
- In flight, when in direct law, the pilot uses the THS conventionally to fly in trim. In flight, the aircraft pitch trim setting depends on the aircraft CG, weight, altitude and speed. As the result, the relation between the aircraft CG, and the THS setting displayed on the pitch trim wheel, does not apply in flight.

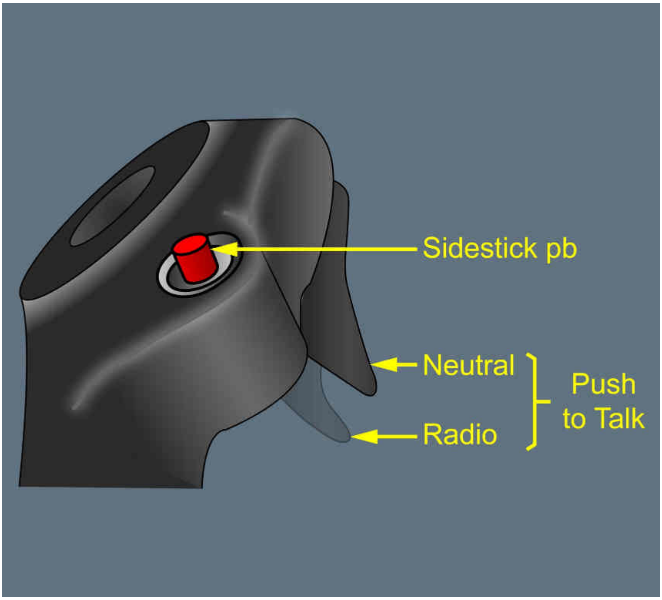
After nosewheel touchdown, when the pitch attitude becomes less than 2.5 ° for more than 5 s and if the ground spoilers are retracted:
- If the speed is below 80 kt, pitch trim automatically resets to 4 ° UP.
- If the speed is above 80 kt, a touch-and-go is detected, and the pitch trim is automatically set to the takeoff value, based on the CG measured during the approach.

LATERAL CONSOLES

Ident.: DSC-27-20-30-00000396.0003001 / 18 MAY 22
Applicable to: ALL



SIDESTICKS



The sidesticks are springloaded to neutral. They are not mechanically linked, and do not receive feedback from the flight control surfaces.
When the autopilot is engaged, the sidesticks are locked in the neutral position.

If a flight crewmember applies a force above a given threshold:
- The sidestick unlock
- The autopilot disengages
- The AUTO FLT AP OFF alert triggers.

L3 The autopilot disengages when a pilot applies a force of more than 5 daN in pitch, or 3.5 daN in roll.

L1 *Note:* *This is not the recommended method for autopilot disengagement. For more information, Refer to DSC-22_30-30-30 Manual Disengagement 1*

Each sidestick has two controls:
- The Radio Push To Talk switch
- The sidestick pb, for autopilot disengagement, or sidestick priority.

SIDESTICK PRIORITY LOGIC

At all times, only one flight crewmember should fly the aircraft.
However, if both flight crewmembers use their sidesticks simultaneously, their orders are algebraically added.

L2 The flight control laws limit the combined order to the equivalent of the full deflection of one sidestick.

L1 In this case the two green SIDE STICK PRIORITY lights on the glareshield come on and "DUAL INPUT" voice message is activated.
A flight crewmember can deactivate the other sidestick and take full control, by pressing and keeping pressed the sidestick pb.
To deactivate the other sidestick, the flight crewmember must press their sidestick pb for 40s.
The other sidestick is permanently deactivated, until any flight crewmember presses their sidestick pb.
If both flight crewmembers press their sidestick pb, the last pilot to press gets the priority.

L2 If one sidestick was deactivated on ground, the CONFIG L(R) SIDESTICK FAULT alert is triggered at takeoff power application, or during the TO CONFIG test.

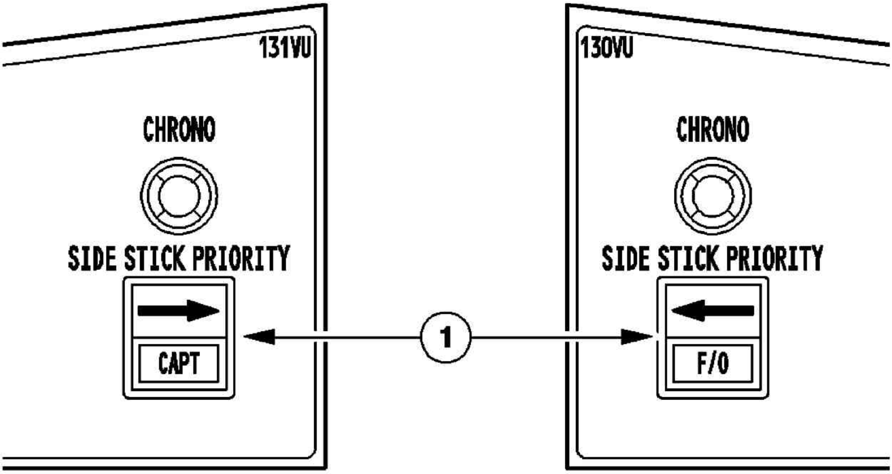
L1 For more information: *Refer to DSC-27-20-30 Glareshield*

ARMREST

The armrest on the sidestick side of the Captain and F/O seats are adjustable.
Correctly adjusting the seat eases the handling of the sidestick.
For information on how to adjust the armrest: *Refer to DSC-25-10-30 Pilot Seat Outboard Armrest Adjustment*.

GLARESHIELD

Ident.: DSC-27-20-30-00000404.0002001 / 03 NOV 21
Applicable to: ALL



(1) SIDE STICK PRIORITY lt

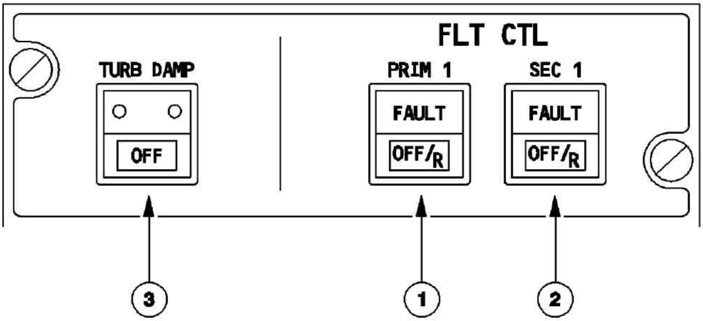
Arrow red lt : - Illuminates in front of the flight crew losing authority.
- Extinguishes if flight crew has recovered their authority, ie:
  - If the other take-over pushbutton is released prior priority condition is latched, or
  - If flight crew has used their take-over pushbutton to cancel a latched priority situation.

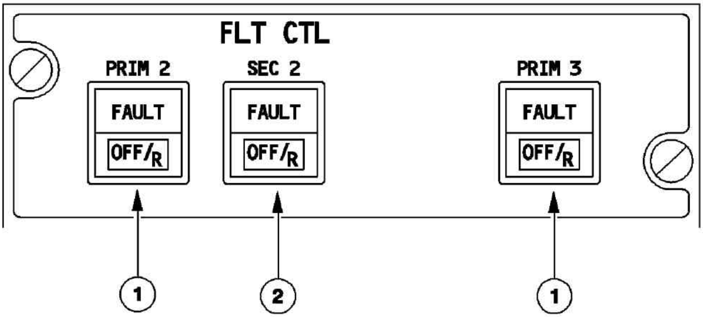
Sidestick priority audio: a "PRIORITY LEFT" or "PRIORITY RIGHT" audio voice message is given each time priority is taken.

CAPT-F/O green lt :	- Illuminates in front of the flight crew who has taken priority by pressing the takeover push button if the opposite stick is not at neutral. or - CAPT and F/O light illuminate in case of simultaneous input on both sidesticks. - Extinguishes when the opposite stick is returned to the neutral position.

OVERHEAD PANEL

Ident.: DSC-27-20-30-00000420.0003001 / 08 OCT 12
Applicable to: ALL


TURB DAMP
OFF
FLT CTL
PRIM 1
FAULT
OFF/R
SEC 1
FAULT
OFF/R
3
1
2


FLT CTL
PRIM 2
FAULT
OFF/R
SEC 2
FAULT
OFF/R
PRIM 3
FAULT
OFF/R
1
2
1

(1) PRIM pushbuttons (guarded)

Control the Flight Control Primary Computers (FCPC).

ON : The following functions are provided by each computer :
- Normal pitch
- Normal lateral
- MLA
- Speedbrakes, ground spoilers control logic
- Pitch alternate
- Pitch direct
- Roll direct
- Yaw alternate
- Rudder travel
- Ailerons droop
- Abnormal attitude law
- Autopilot laws' computation
- Characteristic speeds computation

OFF : The corresponding computer is not active. To reset, switch it OFF, then on.

FAULT lt : The amber FAULT light, and associated ECAM caution, come on, when a failure is detected.
The FAULT light goes off, when OFF is selected, or at the end of the PRIM power-up test, provided it is satisfactory.

(2) SEC pushbuttons (guarded)

Control the Flight Control Secondary Computers (FCSC).

ON : The following functions are provided by each computer :
- Pitch direct
- Roll direct
- Yaw alternate
- Rudder trim
- Rudder travel

OFF : The corresponding computer is not active. To reset, switch it OFF, then on.

FAULT lt : The amber FAULT light, and associated ECAM caution, come on, when a failure is detected.
The FAULT light goes off, when OFF is selected.
It flashes at the end of a SEC power-up test (at electrical power application).

(3) TURB DAMP pushbutton

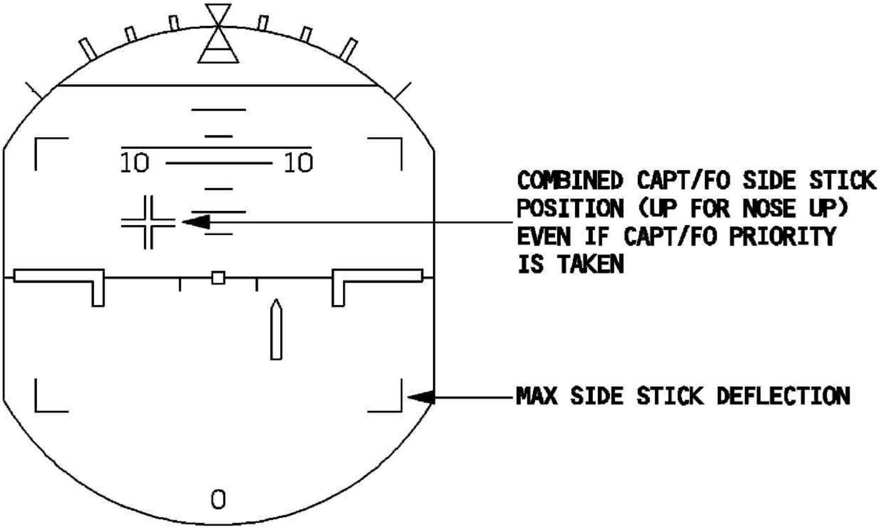
on : Command of Turbulence Damping function is added to normal law elevator and yaw damper command.

OFF : Turbulence Damping function commands are inhibited.

SIDE STICK INDICATIONS ON PFD

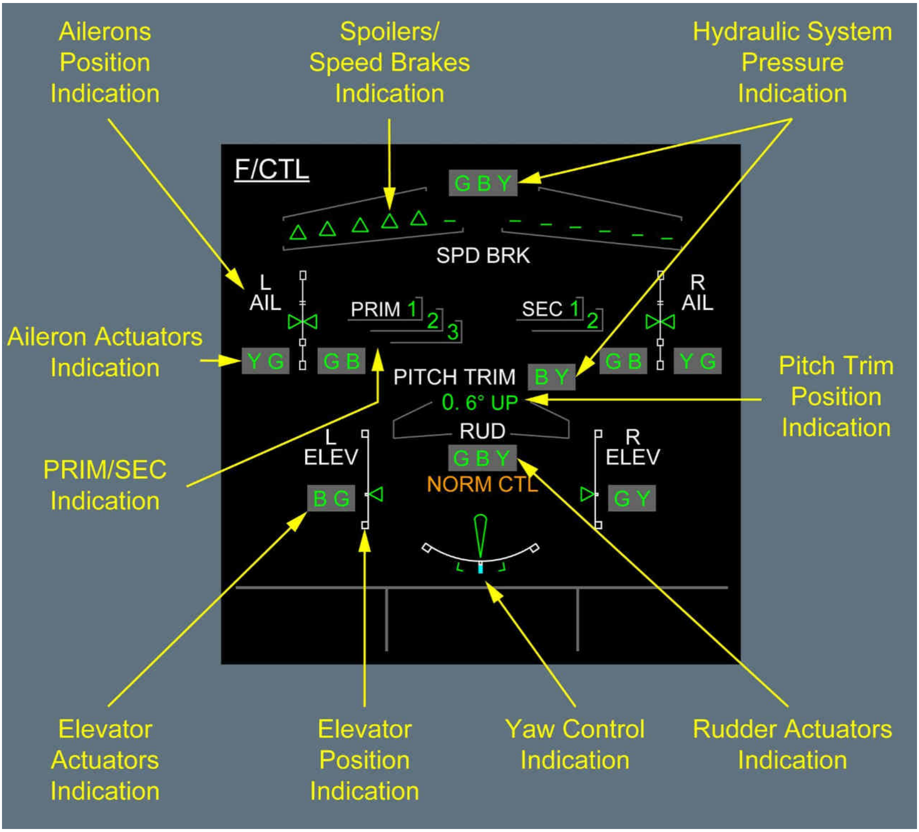
Ident.: DSC-27-20-30-00000426.0004001 / 17 MAR 11
Applicable to: ALL

On ground, after first engine start, side stick position indications appear white on both PFDs.
The indication disappears when the Nose Landing Gear is fully extended.


10
10
0
COMBINED CAPT/FO SIDE STICK POSITION (UP FOR NOSE UP) EVEN IF CAPT/FO PRIORITY IS TAKEN
MAX SIDE STICK DEFLECTION

ECAM F/CTL PAGE

Ident.: DSC-27-20-30-00000434.0004001 / 03 NOV 23
Applicable to: ALL


Ailerons Position Indication
Spoilers/ Speed Brakes Indication
Hydraulic System Pressure Indication
F/CTL
G B Y
SPD BRK
L AIL
R AIL
PRIM 1 2 3
SEC 1 2
Aileron Actuators Indication
Y G
G B
G B
Y G
PITCH TRIM
B Y
0. 6° UP
Pitch Trim Position Indication
RUD
G B Y
NORM CTL
L ELEV
R ELEV
B G
G Y
PRIM/SEC Indication
Elevator Actuators Indication
Elevator Position Indication
Yaw Control Indication
Rudder Actuators Indication

SPOILERS/SPEED BRAKES INDICATION

△	Spoiler is extended.
_	Spoiler is retracted.
△	Spoiler fault is detected.

1	Spoiler fault retracted.
X	Spoiler position is not valid.

Note: Same indications are displayed on WHEEL page.

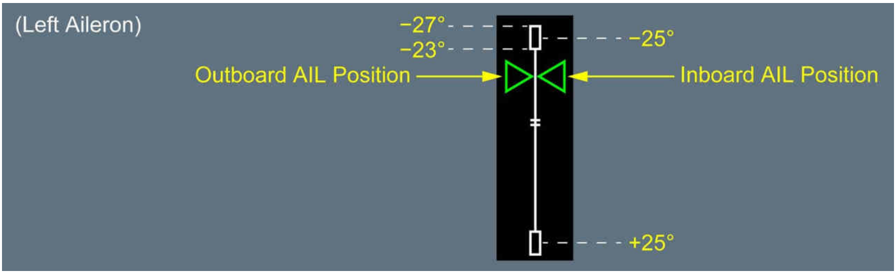
HYDRAULIC SYSTEM PRESSURE INDICATION

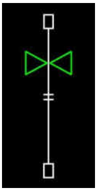
G	Hydraulic system pressure is normal.
G	Hydraulic system pressure is low (downstream the leak valves).

PRIM/SEC INDICATION

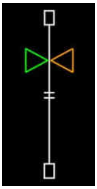
PRIM 1	The flight control computer operates normally.
PRIM 1	The flight control computer failed.

AILERONS POSITION INDICATION

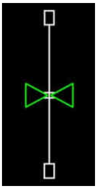




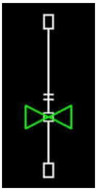
Indicates the position of the associated aileron.
The indexes moving in front of a scale.



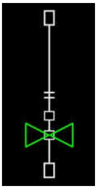
The index becomes amber when both servojacks associated to the affected aileron are not available.



Neutral position in clean configuration.



Neutral position in CONF 1+F (droop).

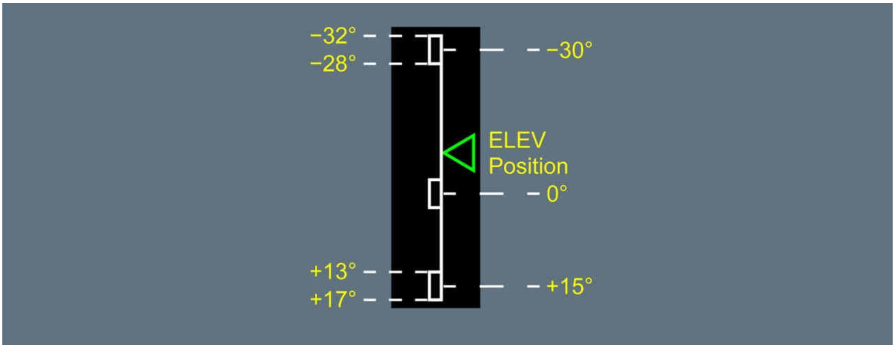


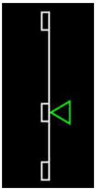
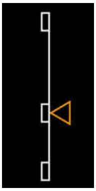
Neutral position in CONF 2, 3, full (droop).

AILERON/ELEVATOR/RUDDER ACTUATORS INDICATION

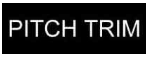
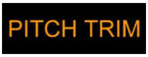
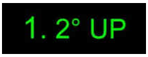
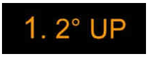
B	The power supply of the associated actuator is available.
B	The power supply of the associated actuator failed (hydraulic system low pressure).
B	The associated electrical failure is detected by PRIM.

ELEVATOR POSITION INDICATION

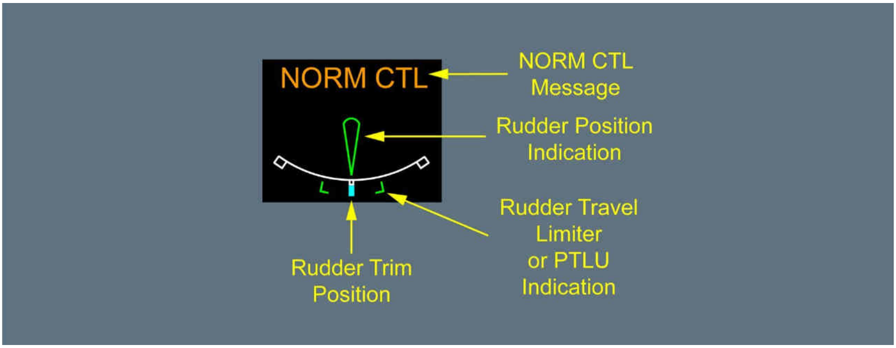


	Normal operation.
	Both associated actuators are not available.

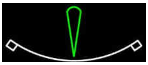
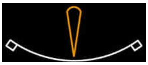
PITCH TRIM POSITION INDICATION

 PITCH TRIM	Normal operation.
 PITCH TRIM	The THS electrical control is lost.
 1. 2° UP	Normal operation. The value varies from 2 ° down to 14 ° up.
 1. 2° UP	B + Y hydraulic system pressure is low.

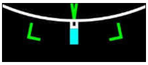
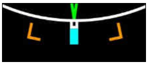
YAW CONTROL INDICATIONS


NORM CTL
NORM CTL Message
Rudder Position Indication
Rudder Travel Limiter or PTLU Indication
Rudder Trim Position

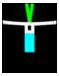
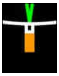
Rudder Position Indication

	Normal operation.
	B + G + Y hydraulic system pressure is low.

Rudder Travel Limiter or PTLU Indication

	Normal operation.
	Travel Limiters 1 and 2 failed.

Rudder Trim Position

	Normal operation. The position varies from -29.2 ° to +29.2 °.
	The rudder trim systems 1 and 2 are inoperative.

NORM CTL Message

NORM CTL	The normal rudder command is lost. The rudder is then controlled by the Backup Control Module.

MEMO DISPLAY

Ident.: DSC-27-20-30-A-00017253.0001001 / 06 SEP 16
Applicable to: ALL

GND SPLRS ARMED : This memo appears in green, when the ground spoilers are armed.

Ident.: DSC-27-20-30-A-00017255.0010001 / 21 MAR 16
Applicable to: LV-KAN, LV-KAO

SPEED BRK : This memo flashes in amber, when the speedbrakes are extended in Flight Phases 2, 3, 4, and 5.

SPEED BRK : This memo appears in green, when the speedbrakes are extended in Flight Phase 6.

After a delay, this memo flashes in amber if one of the following conditions occurs:
- After 50 s, if at least one engine is above idle, or
- After 7 s, if at least one engine is above idle and the AP/FD TCAS mode orders a TCAS RA nose-up maneuver.

SPEED BRK : This memo appears in green, when the speedbrakes are extended in the final approach below 800 ft. After 5 s, this memo flashes in amber, regardless of the landing configuration.

Ident.: DSC-27-20-30-A-00017255.0003001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

SPEED BRK : This memo flashes in amber, when the speedbrakes are extended in Flight Phases 2, 3, 4, and 5.

SPEED BRK : This memo appears in green, when the speedbrakes are extended in Flight Phase 6. This memo flashes in amber, after 50 s, if at least one engine is above idle.

SPEED BRK : This memo appears in green, when the speedbrakes are extended in Flight Phase 7. After 5 s, this memo flashes in amber, and the associated "SPD BRK STILL OUT" caution appears on the ECAM, regardless of the landing configuration.

Ident.: DSC-27-20-30-A-00017254.0001001 / 21 MAR 16
Applicable to: ALL

TURB DAMP OFF : This memo appears in green, when the TURB DAMP pb is set to OFF.

GENERAL

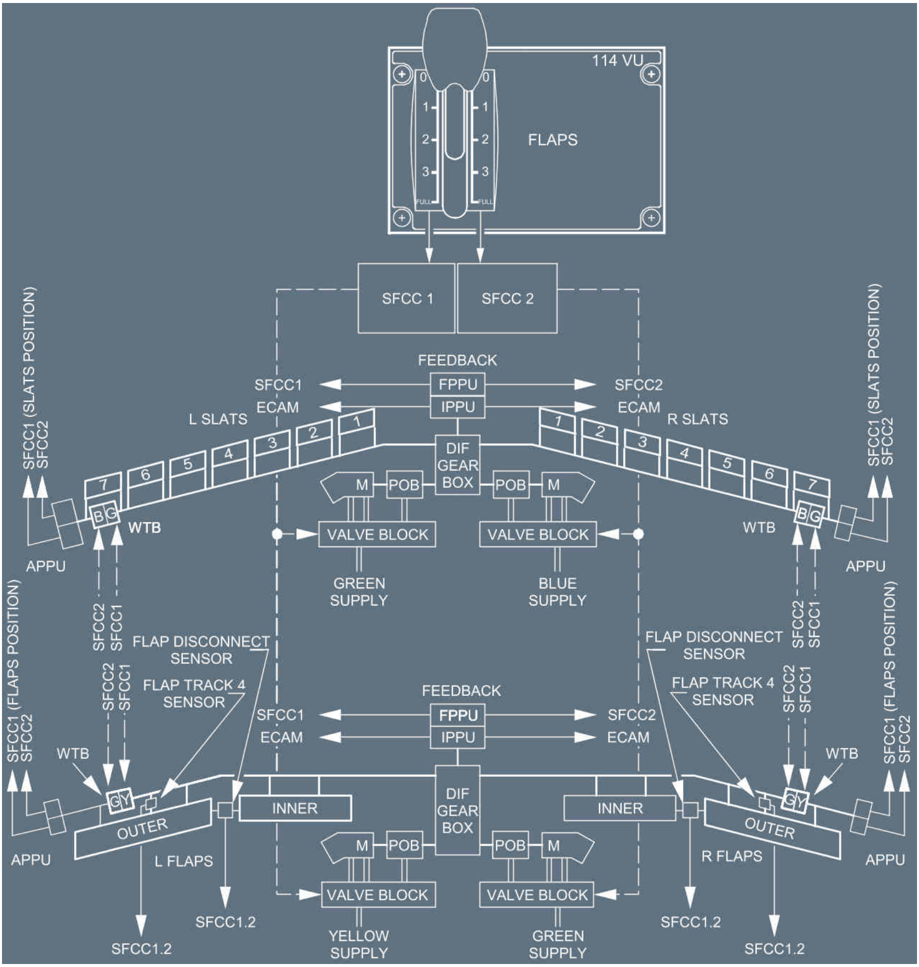
Ident.: DSC-27-30-10-00000488.0001001 / 03 NOV 21
Applicable to: ALL

The slat and flap system includes all of the following main components:
- Seven slats, two flaps surfaces and two ailerons (aileron droop function) per wing. These surfaces are electrically controlled and hydraulically operated. The flight crew extends the slats and flaps by moving the flaps lever on the center pedestal. It has five positions.
- Two SFCCs, each containing one slat channel and one flap channel
- A PCU which is made of two independent hydraulic motors coupled by a differential gearbox. The motors use green and blue hydraulic power for the slats, and yellow and green power for the flaps. The POB locks the transmission when the slat or flap surfaces have reached the selected position or if hydraulic power fails.
- Two APPUs that measure the asymmetry between the left and right wings
- A flap disconnect detection system, which detects attachment failure and inhibits the flap operation in order to prevent further damage. A sensor detects the failure by measuring excessive differential movement between the inner and the outer flaps.
- The WTBs which activate in the case of an uncommanded movement of the surfaces, such as runaway, asymmetry or over speed. They cannot be released in flight. They use blue and green hydraulic power for the slats, and green and yellow for the flaps.
- The FPPUs that feedback position information to the SFCCs
- An IPPU that sends position data to the ECAM.

Note:
- *If the flap WTB is on, the flight crew can still operate the slats, and if the slat WTB is on, the flight crew can still operate the flaps*
- *If one SFCC is inoperative, both slats and flaps operate at half speed*
- *If one hydraulic system is inoperative, the corresponding surfaces (slats or flaps) operate at half speed.*

ARCHITECTURE

Ident.: DSC-27-30-10-00000491.0001001 / 22 MAY 12
Applicable to: ALL


114 VU
0
1
2
3
FULL
FLAPS
SFCC 1
SFCC 2
FEEDBACK
FPPU
IPPU
SFCC1
ECAM
SFCC2
ECAM
L SLATS
R SLATS
1
2
3
4
5
6
7
DIF
GEAR
BOX
M
POB
VALVE BLOCK
GREEN
SUPPLY
BLUE
SUPPLY
B G
WTB
APPU
SFCC1 (SLATS POSITION)
SFCC2
SFCC2
SFCC1
FLAP DISCONNECT
SENSOR
FLAP TRACK 4
SENSOR
SFCC1 (FLAPS POSITION)
SFCC2
G Y
INNER
OUTER
L FLAPS
R FLAPS
SFCC1.2
YELLOW
SUPPLY
GREEN
SUPPLY

CONFIGURATIONS

Ident.: DSC-27-30-10-00000492.0001001 / 21 MAR 16
Applicable to: ALL

The FLAPS lever has 5 positions: 0, 1, 2, 3 and FULL.
Two configurations correspond to the FLAPS lever position 1 : CONF 1 or CONF 1 + F.
The selection is done as explained in the following paragraphs.

AUTOMATIC RETRACTION SYSTEM (ARS)

Ident.: DSC-27-30-10-00000493.0001001 / 21 MAR 16
Applicable to: ALL

When CONF 1 + F is selected, the auto retraction of flaps to 0 occurs at 200 kt (before VFE, which is 215 kt).

FLAP LOAD RELIEF SYSTEM (FLRS)

Ident.: DSC-27-30-10-00000494.0003001 / 21 MAR 16
Applicable to: ALL

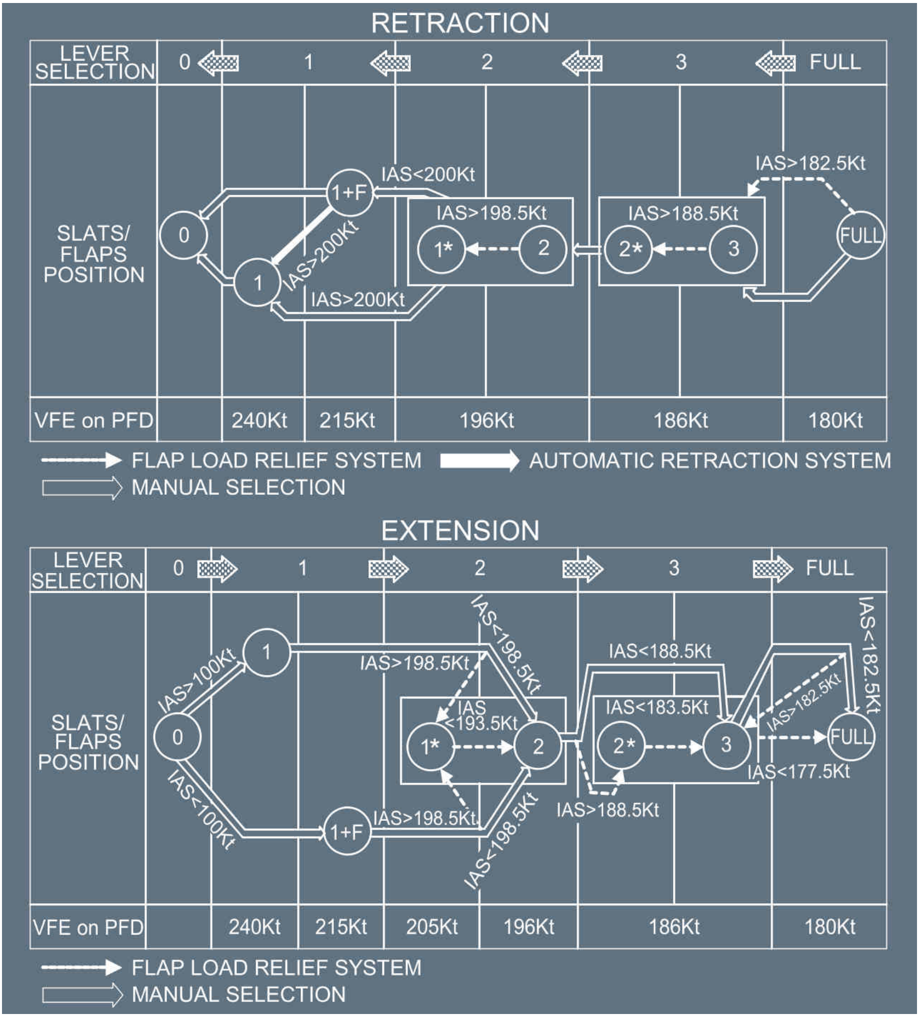
Only available in CONF 2, 3, or FULL. When activated, the system retracts the flaps to the deflection corresponding to the next retracted lever position.
Auto retraction of the flaps only occurs in case of VFE exceedance (VFE +2.5 kt).
If speed is reduced below VFE (VFE -2.5 kt), flaps return to their normal (selected) position.
In CONF 2, auto retraction results in CONF 1* (20 ° slats/8 ° flaps).
In CONF 3, auto retraction results in CONF 2* (23 ° slats/14 ° flaps).
These configurations can be obtained only by FLRS activation.

Note:
1. *When FLAPS 1 is selected, VFE of CONF 1 or CONF 1 + F is displayed, depending on the actual configuration. In approach, VFE next is 205 kt (VFE of CONF 1*).*
2. *When FLAPS 2 is selected in approach, VFE of CONF 2 or CONF 1* is displayed, depending on the FLRS activation.*
3. *When FLAPS 3 is selected, only VFE of CONF 3 is displayed on PFD independently of FLRS activation.*

In case of FLRS activation, the ECAM upper display shows a flashing “RELIEF” message.
If the speed is increased by 4 kt above the VFE, corresponding to the actual flap/slat configuration, an overspeed warning appears on the ECAM.

RETRACTION/EXTENSION SCHEMATIC

Ident.: DSC-27-30-10-00000495.0003001 / 22 MAY 12
Applicable to: ALL


RETRACTION
LEVER SELECTION
0
1
2
3
FULL
SLATS/ FLAPS POSITION
IAS<200Kt
1+F
0
IAS>200Kt
1
IAS>200Kt
IAS>198.5Kt
1*
2
IAS>188.5Kt
2*
3
IAS>182.5Kt
FULL
VFE on PFD
240Kt
215Kt
196Kt
186Kt
180Kt
FLAP LOAD RELIEF SYSTEM
AUTOMATIC RETRACTION SYSTEM
MANUAL SELECTION
EXTENSION
LEVER SELECTION
0
1
2
3
FULL
SLATS/ FLAPS POSITION
IAS>100Kt
1
0
IAS<100Kt
1+F
IAS>198.5Kt
IAS<198.5Kt
IAS <193.5Kt
1*
2
IAS>198.5Kt
IAS<198.5Kt
IAS<188.5Kt
IAS<183.5Kt
2*
3
IAS>188.5Kt
IAS>182.5Kt
IAS<182.5Kt
FULL
IAS<177.5Kt
VFE on PFD
240Kt
215Kt
205Kt
196Kt
186Kt
180Kt
FLAP LOAD RELIEF SYSTEM
MANUAL SELECTION

SLATS ALPHA/SPEED LOCK FUNCTION

Ident.: DSC-27-30-10-00000496.0003001 / 17 MAR 11
Applicable to: ALL

This function inhibits slats retraction at a high angle-of-attack and/or at low speed.
The SFCCs use a corrected angle-of-attack (alpha), or air speed information from the ADIRUs to inhibit slat retraction.
If alpha exceeds 8.5 °, or the speed goes below 148 kt, the retraction from position 1 to 0 is inhibited.
The inhibition is removed when alpha goes below 8.2 °, and when the speed exceeds 154 kt. In this case, the slats automatically retract to 0.

The function is not active if:
- Alpha exceeds 8.5 °, or the speed goes below 148 kt after the lever has been set to 0.
- Aircraft is on the ground, with the speed below 60 kt.

SIGNALS TO OTHER SYSTEMS

Ident.: DSC-27-30-10-00000497.0001001 / 21 MAR 16
Applicable to: ALL

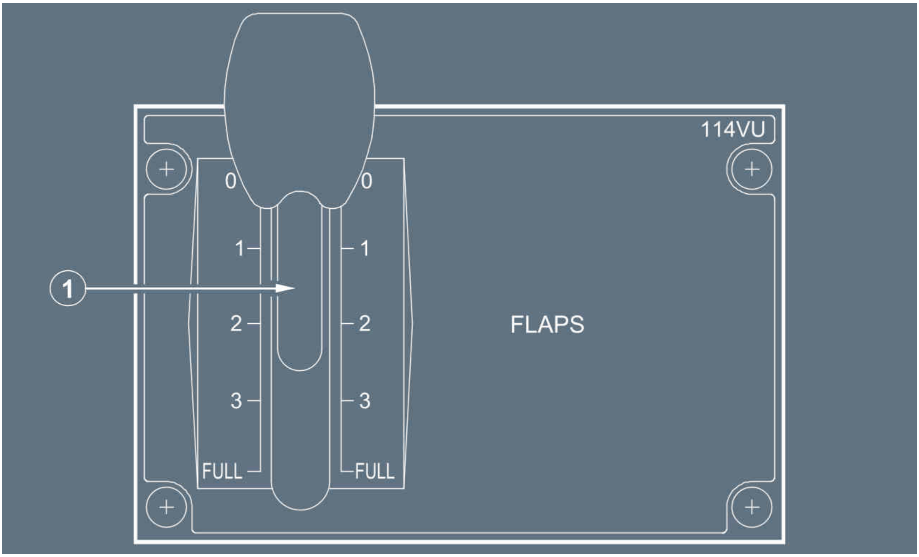
The SFCCs transmit flaps/slats positions to the following systems :
- PRIM and SEC
- FMGEC
- ADIRU
- EIU
- CIDS
- GPWS

Note: *The ECAM system receives the position information directly from the Instrumentation Position Pick-Off Unit (IPPU). This information is used for warnings and position indications on the E/WD.*

Intentionally left blank

PEDESTAL

Ident.: DSC-27-30-20-00000498.0003001 / 09 OCT 12
Applicable to: ALL



(1) FLAPS lever
The FLAPS lever selects simultaneous operation of the slats and flaps.
The five lever positions correspond to the following surface positions :

Lever Position	SLATS	FLAPS	AILERONS	Indication on ECAM	Flight phase		
0	0	0	0				CRUISE
1	16	0	0	1			HOLD
		8	5	1 + F	TO		
2	20	8	10	2(1)			APPR
	20	14	10	2	TO		
3	23	14	10	3(2)		LDG	
3	23	22	10	3			
FULL	23	32	10	FULL			

(1) *This slats/flaps position corresponds to CONF 1**

(2) *This slats/flaps position corresponds to CONF 2**

Before selecting any position, the lever must be pulled out of detent.

Moreover, balks are provided at Positions 1 and 3 to avoid excessive flap/slat travel demand by a single pilot action.

Note: *It is not possible to select an intermediate lever position.*

TAKEOFF IN CONF 1 :

CONF 1 + F (16/ 8) is selected. The flaps automatically retract at 200 kt.

TAKEOFF OR GO-AROUND IN CONF 2 OR 3 :

At FLAPS 1 selection : CONF 1 + F (16 / 8) is selected, if speed it less than 200 kt.
Then, the flaps automatically retract at 200 kt.

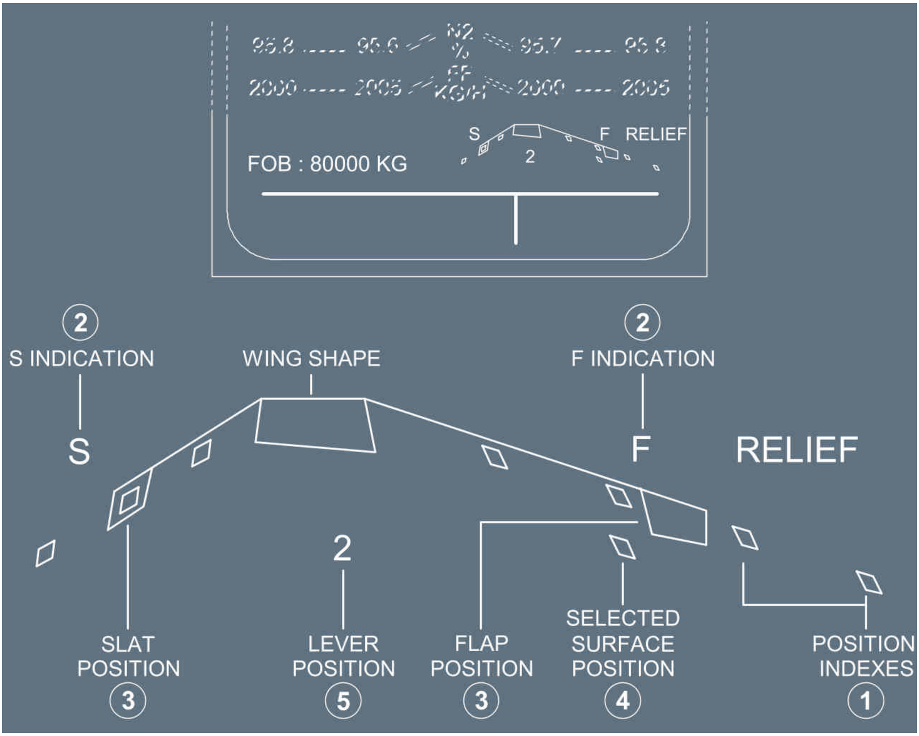
0 TO 1 ABOVE 100 KNOTS :

CONF 1 (16/ 0) is selected.

Note: *After flaps retraction, CONF 1 + F is no longer available until the speed is 100 kt or less, except if CONF 2 or more has been previously selected.*

ECAM UPPER DISPLAY

Ident.: DSC-27-30-20-00000499.0002001 / 09 OCT 12
Applicable to: ALL


95.8
95.6
N2
%
95.7
95.8
2000
2005
FF
KG/H
2000
2005
S
F
RELIEF
2
FOB : 80000 KG
②
S INDICATION
WING SHAPE
②
F INDICATION
S
F
RELIEF
2
SLAT
POSITION
③
LEVER
POSITION
⑤
FLAP
POSITION
③
SELECTED
SURFACE
POSITION
④
POSITION
INDEXES
①

(1) Position indexes:
A fixed grey center part, and three plus four white dots, show all the flaps and slats positions.
The white dots are not displayed in clean configuration.

(2) F and S
Normally white. Not displayed in clean configuration.

The F symbol is :
- replaced by the amber “F LOCKED” message, when wing tip brake is applied to flaps.
- replaced by the green pulsing “F RELIEF” message when the flap load relief system is activated.
- displayed in amber at flap system failure or at yellow and green hydraulic system low pressure.

The S symbol is :
- replaced by the amber “S LOCKED” message when wing tip brake is applied to slats.
- replaced by the green pulsing “A LOCK” message when the alpha/speed lock function is activated.
- displayed in amber at slat system failure or at blue and green hydraulic system low pressure.

(3) Flaps/Slats actual position

The green boxes move independently, when flaps/slats are retracted or extended. When fully retracted, boxes are side by side with wing fixed part. The signal is acquired by separate sensors, not used by the SFCC.
Symbols become amber when S (F) LOCKED. The slat box pulses in green, when the alpha/speed lock function is active. The flap box pulses in green, when the flap load relief system is active.

(4) Selected position

It is in blue when the surfaces are in transit.
It disappears, when the selected position has been reached.
It is provided by the SFCC.

(5) Lever position

Numbers and letters indicate the flap/slat position. It is in green when the actual position agrees with the selected position. It is in blue, when the surfaces are in transit. It is not displayed in clean configuration. It is provided by the SFCC.

AIRCRAFT SYSTEMS

FUEL

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DSC-28-10 Description

DSC-28-10-10 General

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DSC-28-10-20 Tanks

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Description....B
Tank Arrangement....C

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DSC-28-10-40 Fuel Quantity Indication and Level Sensing

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Fuel Level Sensing....B
ARCHITECTURE....C

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Continued from the previous page

DSC-28-10-100 APU Feed

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DESCRIPTION

Ident.: DSC-28-10-10-00000136.0006001 / 10 DEC 09
Applicable to: LV-KAN, LV-KAO

The fuel system :
- Stores fuel.
- Controls and monitors the correct quantity of fuel.
- Supplies fuel to the engines and the Auxiliary Power Unit (APU).
- Controls the transfer of fuel to maintain the Center of Gravity (CG) within limits.
- Maintains fuel in the outer tanks for wing bending relief.
- Allows fuel jettison for rapid weight reduction.
- Controls refueling and defueling.

DESCRIPTION

Ident.: DSC-28-10-10-00000136.0007001 / 27 FEB 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

The fuel system :
- Stores fuel.
- Controls and monitors the correct quantity of fuel.
- Supplies fuel to the engines and the Auxiliary Power Unit (APU).
- Controls the transfer of fuel to maintain the Center of Gravity (CG) within limits.
- Maintains fuel in the outer tanks for wing bending relief.
- Controls refueling and defueling.

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GENERAL

Ident.: DSC-28-10-20-00000143.0001001 / 10 DEC 09
Applicable to: ALL

Fuel is stored in the :
- Wings
- Center section
- Trimmable Horizontal Stabilizer (THS).

DESCRIPTION

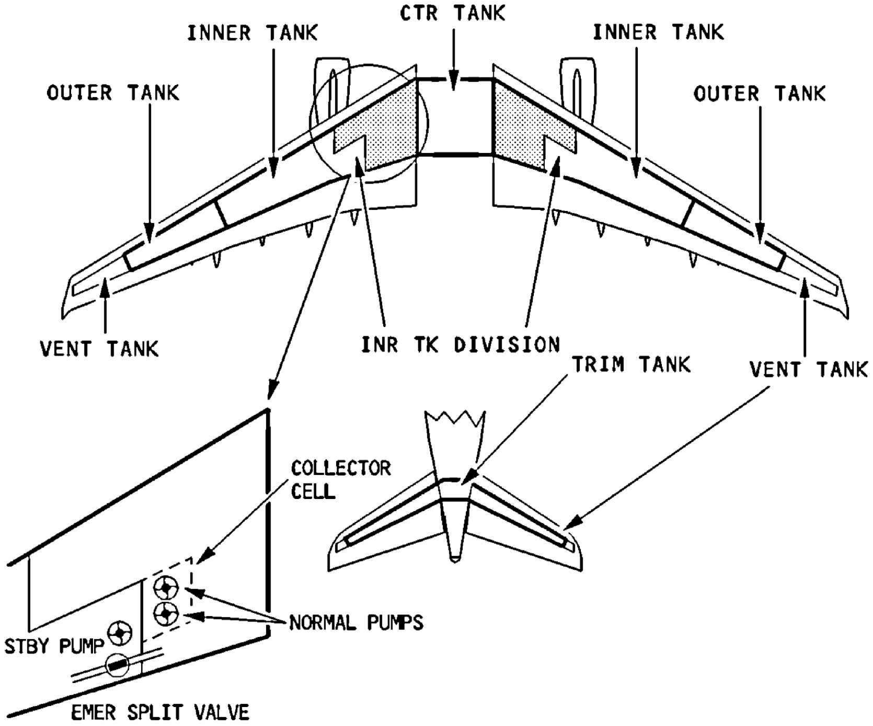
Ident.: DSC-28-10-20-00000146.0005001 / 18 MAR 11
Applicable to: ALL

The wings have inner and outer tanks. Each inner tank contains one collector cell that:
- Maintains a fuel reservoir for the fuel booster pumps and provides negative 'g' protection to feed the engines.
- Is maintained full and contains about 1 000 kg (2 200 lb) of fuel.

Each inner tank is divided into two parts via a SPLIT valve that normally remains open. The inner tank is used as a single tank and, if tank damage is suspected (i.e. FQI data is lost or there is a rapid FQI decrease following an engine failure), the SPLIT valve can be manually closed by using the dedicated pushbutton on the overhead panel.
When split valves are closed, the fuel contained in the AFT section of INNER tanks is still usable via the standby pumps.
In each wing, and on the right of the THS trim tank, there is a vent surge tank outboard of the outer tank.
After refueling to maximum tank capacity, fuel can expand by 2 % (20 °C temperature increase) without spillage.
There is an overpressure protector in each wing surge tank, in the trim surge tank, and between the center and the right inner tanks.

TANK ARRANGEMENT

Ident.: DSC-28-10-20-00000153.0041001 / 14 FEB 11
Applicable to: ALL


INNER TANK
CTR TANK
INNER TANK
OUTER TANK
OUTER TANK
VENT TANK
INR TK DIVISION
TRIM TANK
VENT TANK
COLLECTOR
CELL
NORMAL PUMPS
STBY PUMP
EMER SPLIT VALVE

USABLE FUEL						
		OUTER TANKS	INNER TANKS	CENTER TANK	TRIM TANK	TOTAL
VOLUME	(liters)	3 650 x 2	42 000 x 2	41 560	6 230	139 090
	(US gallons)	964 x 2	11 095 x 2	10 979	1 646	36 743
WEIGHT (1)	(KG)	2 865 x 2	32 970 x 2	32 625	4 891	109 186
	(LB)	6 317 x 2	72 686 x 2	71 925	10 782	240 713

(1) *Fuel specific gravity: 0.785 kg/l or 6.551 lb/US Gal.*

GENERAL

Ident.: DSC-28-10-30-00000161.0003001 / 18 MAR 11
Applicable to: ALL

The fuel system is controlled by two Fuel Control and Monitoring Computers (FCMC).

The FCMCs :
- Measure the fuel quantity and indicate it on the ECAM.
- Calculate the aircraft's Gross Weight and Center of gravity, based on the Zero Fuel Weight and the CG entered by the crew.
- Control transfer of fuel to the inner tanks for engine feed.
- Control transfers of fuel to and from the trim tank for CG control.

Magnetic level indicators are fitted in the lower surfaces of the wing tanks to allow the manual measurement of each tank's fuel quantity.

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FUEL QUANTITY INDICATION

Ident.: DSC-28-10-40-00000165.0001001 / 10 DEC 09
Applicable to: ALL

One FCMC is active and the other is on standby. If the first FCMC fails, then the other FCMC takes over.

Each FCMC calculates the fuel quantity by using the :
- Fuel volume from the fuel probes.
- Fuel density from the densitometers.
- Horizontal Stabilizer angle.
- Aircraft attitude.
- Fuel electrical characteristic from the compensators

The calculated fuel quantity is indicated on both the ECAM and the refuel control panel.

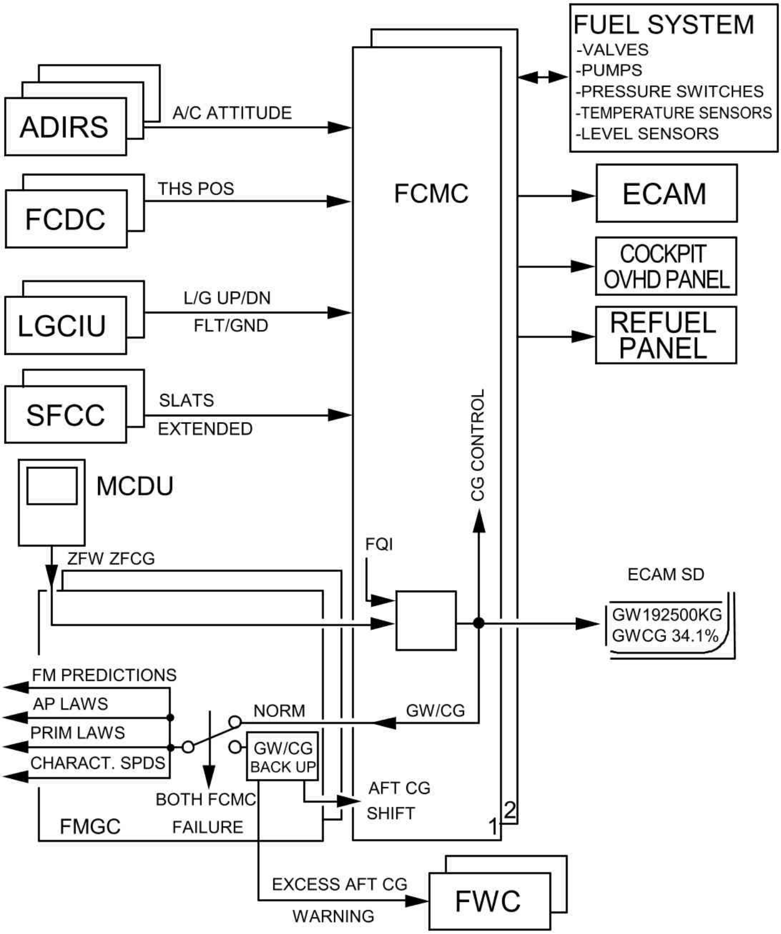
FUEL LEVEL SENSING

Ident.: DSC-28-10-40-00000166.0004001 / 14 FEB 11
Applicable to: ALL

The FCMC also uses information from the following fuel level sensors to control transfers and to provide warnings, independently of the fuel quantity indication:
- Low level sensors:
  - To trigger low level warnings and stop jettison ◁
  - To control center and trim tank transfers.
- High level sensors: To stop refueling when a tank is full
- Vent surge tank level sensor: To stop refueling, or fuel transfer, in case of tank overflow.

ARCHITECTURE

Ident.: DSC-28-10-40-00000167.0003001 / 17 JUN 14
Applicable to: ALL


FUEL SYSTEM
-VALVES
-PUMPS
-PRESSURE SWITCHES
-TEMPERATURE SENSORS
-LEVEL SENSORS
ADIRS
A/C ATTITUDE
FCDC
THS POS
FCMC
ECAM
COCKPIT OVHD PANEL
REFUEL PANEL
LGCIU
L/G UP/DN
FLT/GND
SFCC
SLATS
EXTENDED
CG CONTROL
MCDU
ZFW ZFCG
FQI
ECAM SD
GW192500KG
GWCG 34.1%
FM PREDICTIONS
AP LAWS
PRIM LAWS
CHARACT. SPDS
NORM
GW/CG
GW/CG BACK UP
BOTH FCMC
FAILURE
AFT CG
SHIFT
FMGC
1
2
EXCESS AFT CG
WARNING
FWC

GENERAL

Ident.: DSC-28-10-50-00000168.0003001 / 10 DEC 09
Applicable to: ALL

The main fuel pump system supplies fuel from each inner tank to its corresponding engine. In each wing there are three fuel pumps. Two main fuel pumps in the collector cell and one standby pump outside the collector cell. When closed, the crossfeed valves separate the system into two parts, and their associated fuel pumps supply the engines. When open, the crossfeed valves allow any pump to supply any engine.

MAIN COMPONENTS

Applicable to: ALL

Ident.: DSC-28-10-50-A-00000170.0002001 / 10 DEC 09

INNER TANK PUMPS

During normal operation, all main pumps run.
If a main pump fails, or is switched off, then the standby pump runs. With the crossfeed valves open, one pump is capable of supplying all both engines.

Ident.: DSC-28-10-50-A-00000176.0003001 / 10 DEC 09

CROSSFEED VALVES

The cross feed valve enables any pump to supply any engine. The X-FEED valves automatically opens in electrical emergency configuration.

Ident.: DSC-28-10-50-A-00000181.0001001 / 10 MAY 21

ENGINE LP VALVE

The flow of fuel to an engine can be stopped by closing its respective LP valve via:
- Engine master lever, or
- ENG FIRE pushbutton.

FUEL FEED WITH ALL ENGINES FLAME OUT (ELEC EMER CONFIG)

Applicable to: ALL

Ident.: DSC-28-10-50-B-00000190.0003001 / 21 MAR 17

EMER GEN POWERED BY THE RAT

- The X-FEED valve open automatically.
- Only the left Pump 2 remains powered.

- If left Pump 2 fails, or is selected OFF, right Pump 2 will automatically replace it.
- When the speed goes below 260 kt, or when LAND RECOVERY is selected ON, all MAIN and STBY pumps are lost.

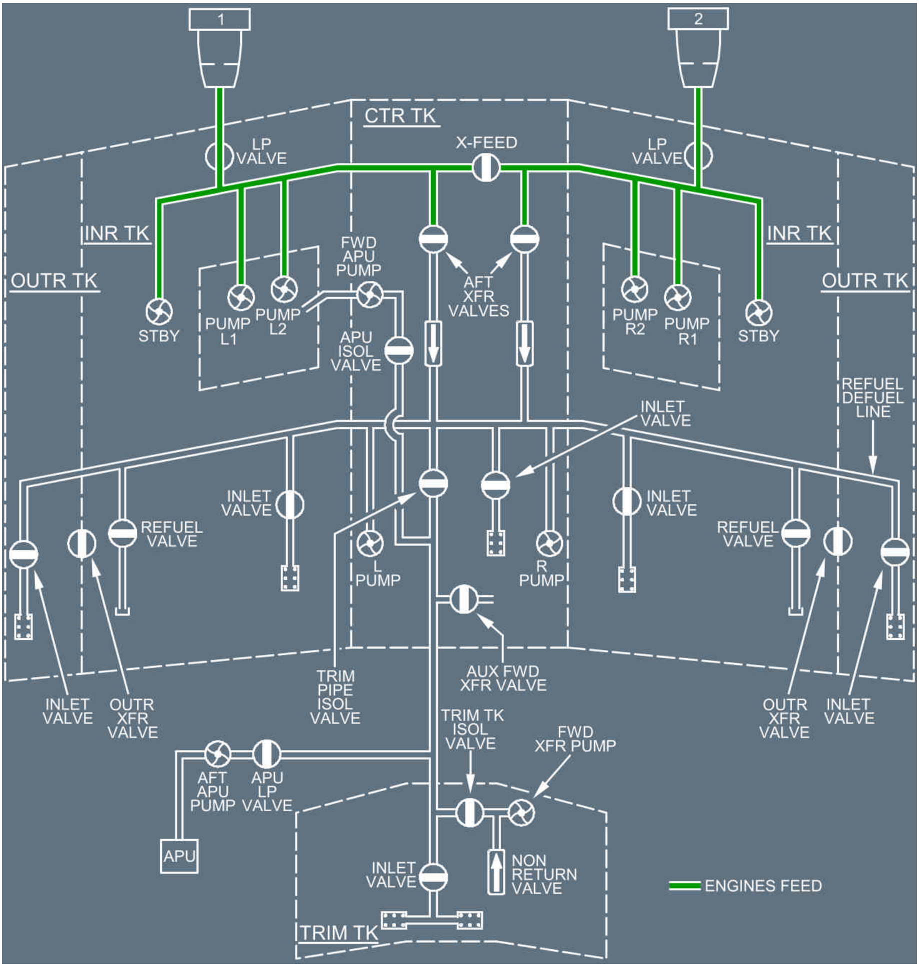
Ident.: DSC-28-10-50-B-00000195.0002001 / 14 FEB 11

FLIGHT ON BATTERIES

All main and STBY pumps are lost.

ENGINE FEED

Ident.: DSC-28-10-50-00000199.0012001 / 22 MAY 12
Applicable to: ALL


1
2
CTR TK
X-FEED
LP VALVE
LP VALVE
INR TK
INR TK
OUTR TK
OUTR TK
FWD APU PUMP
STBY
PUMP L1
PUMP L2
AFT XFR VALVES
PUMP R2
PUMP R1
STBY
APU ISOL VALVE
REFUEL DEFUEL LINE
INLET VALVE
INLET VALVE
INLET VALVE
REFUEL VALVE
REFUEL VALVE
L PUMP
R PUMP
INLET VALVE
OUTR XFR VALVE
TRIM PIPE ISOL VALVE
AUX FWD XFR VALVE
OUTR XFR VALVE
INLET VALVE
TRIM TK ISOL VALVE
FWD XFR PUMP
AFT APU PUMP
APU LP VALVE
APU
INLET VALVE
NON RETURN VALVE
TRIM TK
🟩 ENGINES FEED

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NORMAL OPERATION

Ident.: DSC-28-10-60-00000219.0008001 / 14 FEB 11
Applicable to: ALL

Fuel is always fed to the engines from the inner tanks.

The fuel transfer sequence is as follows:
1. Center tank fuel transfers to the inner tanks.
2. Each inner tank empties down to 4 000 kg (8 830 lb).
3. Trim tank fuel transfers to the inner tanks.
4. Each inner tank empties down to 3 500 kg (7 720 lb).
5. Outer tank fuel transfers to the inner tanks.

Note: *If required for CG control, the trim tank may be emptied earlier (Refer to DSC-28-10-90 General).*

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CENTER TO INNER TANK TRANSFER

Ident.: DSC-28-10-70-00000221.0001001 / 14 FEB 11
Applicable to: ALL

The center tank pumps run continuously, whenever there is fuel in the center tank. Each inner tank inlet valve controls the transfer by cycling its inner tank contents between full and approximately 2 000 kg (4 415 lb) below full. When the center tank is empty, both center tank pumps temporarily stop, and both inner tank inlet valves close.

OUTER TO INNER TANK TRANSFER

Ident.: DSC-28-10-70-00000230.0002001 / 14 FEB 11
Applicable to: ALL

The outer tank fuel is transferred to the inner tanks by gravity. Each outer tank transfer valve controls the transfer by cycling the associated inner tanks contents between 3 500 kg (7 720 lb) and 4 000 kg (8 830 lb). When each outer tank has been empty for 5 min, its outer tank transfer valves close.

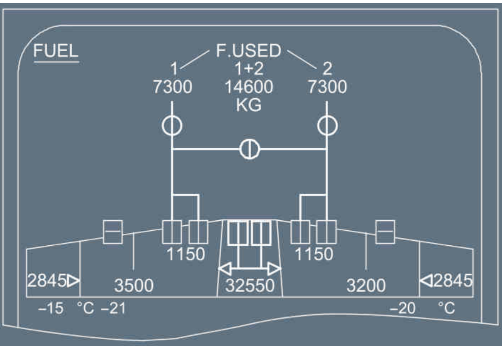
TRIM TANK TRANSFER

Ident.: DSC-28-10-70-00000240.0001001 / 10 DEC 09
Applicable to: ALL

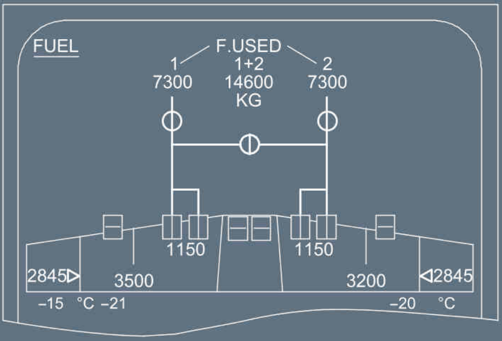
Refer to DSC-28-10-90 General.

ECAM INDICATION

Ident.: DSC-28-10-70-00000242.0010001 / 09 OCT 12
Applicable to: ALL


FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
1150
1150
2845
3500
32550
3200
2845
−15 °C −21
−20 °C

TRANSFER FROM CENTER TANK


FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
1150
1150
2845
3500
3200
2845
−15 °C −21
−20 °C

TRANSFER FROM OUTER TANKS

CENTER TO INNER TANK TRANSFER

Ident.: DSC-28-10-80-00000244.0001001 / 14 FEB 11
Applicable to: ALL

Transfer from the center to inner tanks can be manually selected with the CTR TK XFR pb. When selected MAN, the inner tank inlet valves are opened and the CTR TK pumps run.

The CTR TK pumps must be selected OFF, when the:
- Inner tanks are full, to manually prevent inner tank overflow.
- Center tank is empty.

Note: 1. *When the fuel quantity of each inner tank is below 17 000 kg (37 520 lb), all center tank fuel can be transferred without any risk of overflow.*
2. *When the CTR TK XFR pb is pressed, aft transfer is inhibited.*

OUTER TO INNER TANK TRANSFER

Ident.: DSC-28-10-80-00000247.0001001 / 14 FEB 11
Applicable to: ALL

Transfer from the outer to inner tanks can be manually selected with the OUTR TK XFR pb. When selected ON, the outer tank fuel transfer valves, and the inner and outer inlet valves are opened.

Note: 1. *During an outer to inner tank transfer, the CTR TK pumps must be selected OFF to avoid inadvertent fuel transfer from the center tank to outer tanks.*
2. *When the OUTR TK XFR pb is pressed, aft transfer is inhibited.*

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GENERAL

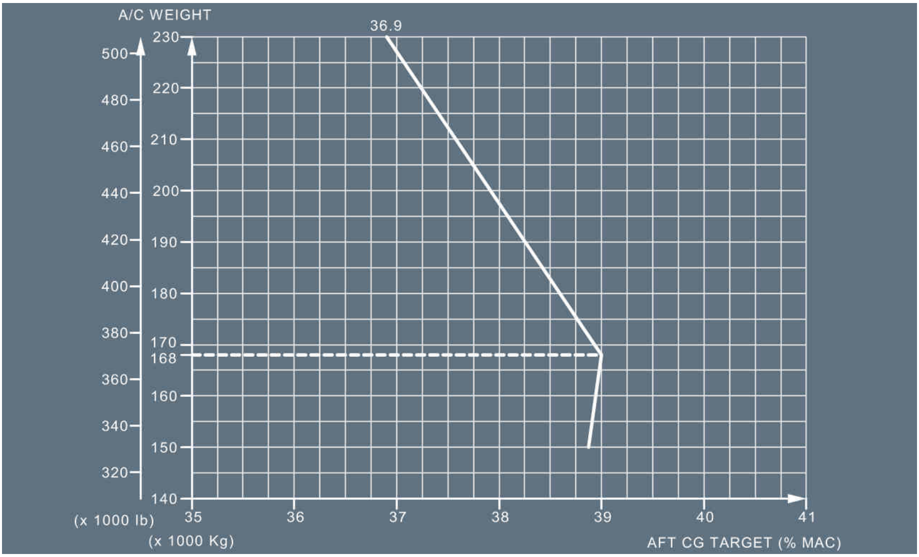
Ident.: DSC-28-10-90-00000263.0001001 / 10 DEC 09
Applicable to: ALL

The trim tank transfer system controls the aircraft's Center of Gravity (CG).

- The system either transfers fuel to the trim tank (aft transfer) or from the trim tank (forward transfer).
- This movement of fuel changes the aircraft's CG.
- When the aircraft is in cruise, the system optimizes the CG position to increase fuel economy by reducing drag.
- Normal operation is automatic, but the crew can manually select a forward fuel transfer.
- The Fuel Control and Monitoring Computer (FCMC) calculates the aircraft's CG and compares it to a target value. (This target depends on the aircraft's actual weight. *Refer to DSC-28-10-90 AFT CG Target*).
- Based on this calculation, the FCMC determines the quantity of fuel to be moved aft or forward in flight.

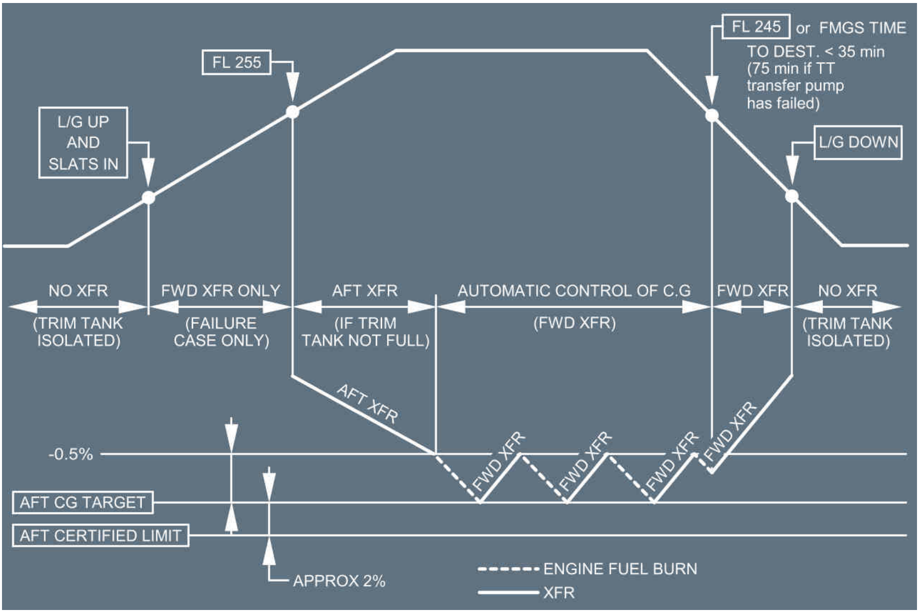
AFT CG TARGET

Ident.: DSC-28-10-90-00000279.0006001 / 21 MAR 17
Applicable to: ALL



NORMAL OPERATION

Ident.: DSC-28-10-90-00000289.0008001 / 22 FEB 17
Applicable to: ALL


FL 255
L/G UP AND SLATS IN
FL 245 or FMGS TIME TO DEST. < 35 min (75 min if TT transfer pump has failed)
L/G DOWN
NO XFR (TRIM TANK ISOLATED)
FWD XFR ONLY (FAILURE CASE ONLY)
AFT XFR (IF TRIM TANK NOT FULL)
AUTOMATIC CONTROL OF C.G (FWD XFR)
FWD XFR
NO XFR (TRIM TANK ISOLATED)
AFT XFR
FWD XFR
FWD XFR
FWD XFR
FWD XFR
-0.5%
AFT CG TARGET
AFT CERTIFIED LIMIT
APPROX 2%
ENGINE FUEL BURN
XFR

Automatic CG control:
- Begins during climb to FL 255.
- Ends at descent to FL 245, or when the FMGES time to destination is less than 35 min (or less than 75 min in the case of trim tank forward transfer pump failure).

Note: 1. *The trim pipe isolation valve and the trim tank isolation valve are closed during takeoff and landing. It is possible to reopen them, when the landing gear is up and the slats are retracted (or when the MODE SEL sw is set at REFUEL on the REFUEL panel).*
2. *If the FMGEC detects a CG that is too far aft, then the target will automatically be moved forward by 3 %. The target also moves forward 1.5 % in the case of FQI data degradation, or if ZFW/ZFWCG have not been entered or need to be reinitialized in flight (modifying CG/GW via the MCDU).*
3. *The above-mentioned CG target alterations should be added together.*

AFT FUEL TRANSFER

Applicable to: ALL

Ident.: DSC-28-10-90-A-00000305.0005001 / 21 MAR 17

GENERAL

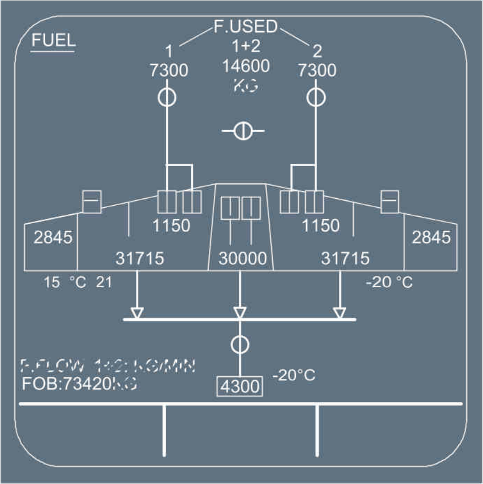
In flight, the FCMC only starts an AFT fuel transfer, when all of the following conditions are met:
- Landing gear is retracted.
- Slats are retracted.
- Trim tank is not full.
- Inner tank's fuel quantity is above 6 250 kg (13 790 lb).
- Aircraft is above FL 255.
- Aircraft CG is not on target.

Normally, only one aft fuel transfer occurs per flight. However, if the CG in cruise is ahead of the target by more than 2 % , and the trim tank quantity is below 3 000 kg (6 620 lb), an additional aft transfer will occur. An aft transfer stops when the :
- Computed CG = Target CG -0.5 % , or
- Trim tank high level sensor becomes wet, or
- Inner tank's fuel quantity reaches 6 250 kg (13 790 lb), or
- T TANK MODE pushbutton is set to FWD, or
- Fuel transfer from the center or outer tanks to the inner tanks is manually selected.
- Fuel automatically transfers from the center tank to the inner tanks.

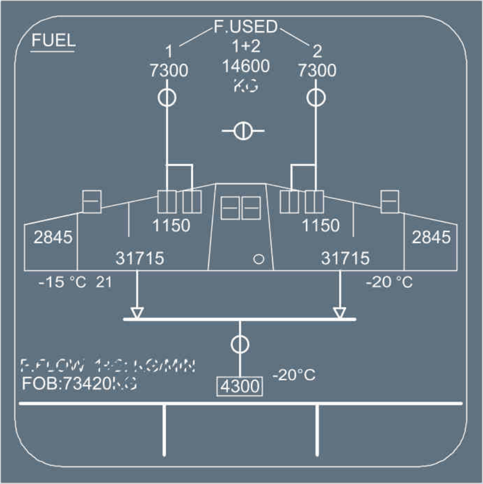
Fuel for trim tank aft transfer is provided by the center TK, when it contains fuel, or by the inner tanks when the center tank is empty. If, during the transfer, the inner tanks are unbalanced by more than 500 kg (1 100 lb), the transfer will stop on the lightest side, and the related aft transfer valve will automatically close until fuel balance is restored.

Ident.: DSC-28-10-90-A-00000302.0008001 / 09 OCT 12

ECAM INDICATION


FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
1150
1150
2845
2845
31715
30000
31715
15 °C 21
-20 °C
F.FLOW 1+2: KG/MIN
FOB:73420KG
4300
-20°C

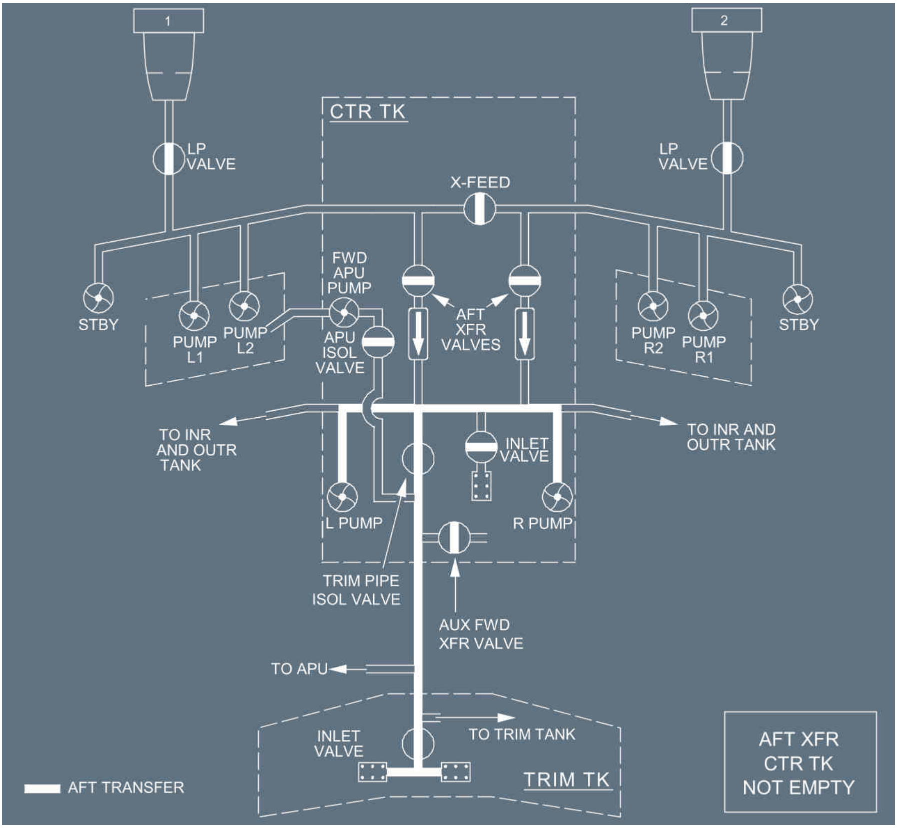
AFT TRANSFER WITH CENTER TANK NOT EMPTY

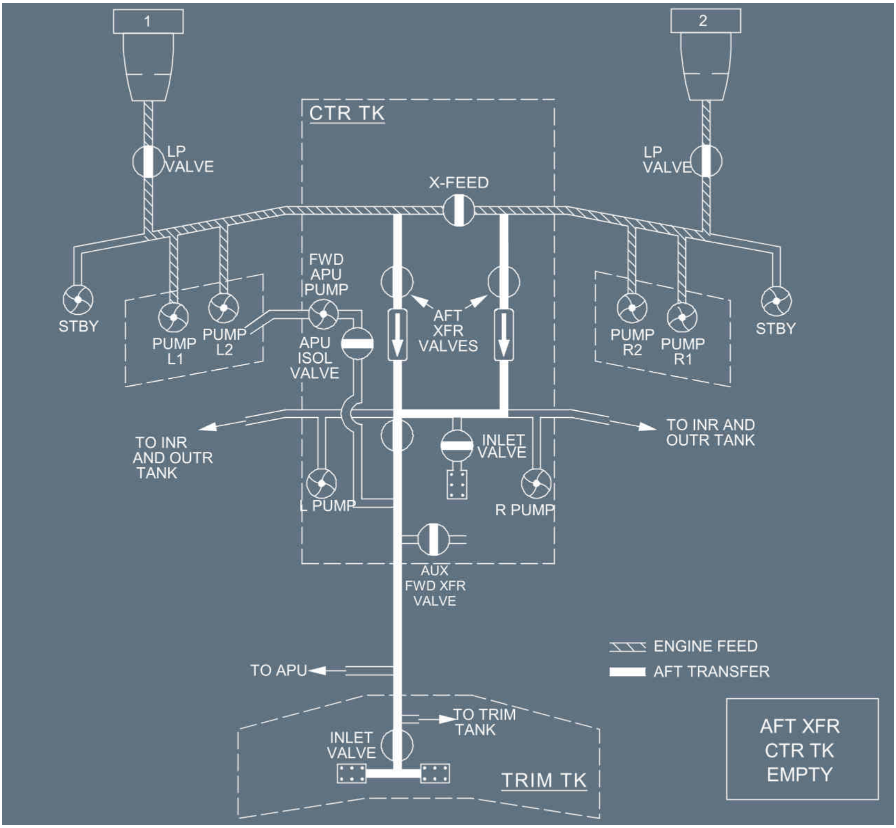

FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
1150
1150
2845
2845
31715
0
31715
-15 °C 21
-20 °C
F.FLOW 1+2: KG/MIN
FOB:73420KG
4300
-20°C

AFT TRANSFER WITH CENTER TANK EMPTY

Ident.: DSC-28-10-90-A-00000317.0005001 / 21 MAR 17

SCHEMATIC


1
2
CTR TK
LP VALVE
LP VALVE
X-FEED
FWD APU PUMP
AFT XFR VALVES
STBY
PUMP L1
PUMP L2
APU ISOL VALVE
PUMP R2
PUMP R1
STBY
TO INR AND OUTR TANK
TO INR AND OUTR TANK
INLET VALVE
L PUMP
R PUMP
TRIM PIPE ISOL VALVE
AUX FWD XFR VALVE
TO APU
INLET VALVE
TO TRIM TANK
TRIM TK
AFT TRANSFER
AFT XFR
CTR TK
NOT EMPTY


1
2
CTR TK
LP VALVE
LP VALVE
X-FEED
FWD APU PUMP
AFT XFR VALVES
STBY
PUMP L1
PUMP L2
APU ISOL VALVE
PUMP R2
PUMP R1
STBY
TO INR AND OUTR TANK
TO INR AND OUTR TANK
INLET VALVE
L PUMP
R PUMP
AUX FWD XFR VALVE
ENGINE FEED
AFT TRANSFER
TO APU
TO TRIM TANK
INLET VALVE
TRIM TK
AFT XFR CTR TK EMPTY

AUTOMATIC FORWARD FUEL TRANSFER

Applicable to: ALL

Ident.: DSC-28-10-90-B-00000327.0009001 / 28 MAR 11

GENERAL

The FCMC sends a forward fuel transfer signal, if one of the following conditions are met:
- The calculated CG = Target. Forward fuel transfer stops, when the computed CG = The target CG -0.5 %.
- The fuel contents of one of the two inner tanks decreases to 4 000 kg (8 830 lb). Forward fuel transfer stops, when the fuel content reaches 5 000 kg (11 030 lb)

- The FMGES sends a time-to-destination signal below the threshold, or the aircraft descends below FL 245. In this case, transfer is continuous but is controlled by the inner tank high levels to prevent overflow.
- Jettison ◁ is initiated.
- In electrical emergency configuration.

Note: *If the center tank contains fuel and the CG is forward of 32 % MAC, the transfer will be completed in two steps:*
  - *When the center tank quantity reaches 17 000 kg (37 520 lb), the trim tank is decreased to 2 400 kg (5 290 lb).*
  - *When the center tank is empty, the trim tank will be emptied.*

A forward transfer:
- Is normally directed to the inner tanks, and may be directed to the center tank, if it is not empty.
- Is directed to the lighter inner tank, if there is an imbalance of 500 kg (1 100 lb) between the two inner tanks.

In emergency electrical configuration, the forward transfer is always directed to the inner tanks.
In normal operations, a forward transfer is performed by the trim tank forward transfer pump. The pump starts to operate, when both the landing gear and the slats are retracted, as long as there is fuel in the trim tank. It operates continuously during the flight, until the trim tank is empty, or the T. TANK FEED selector is set to ISOL.

Note: *The running trim tank forward transfer pump has no effect on the aft transfer, because the TRIM TK ISOL VALVE is normally closed during this transfer.*

In the event of pump failure, forward transfer occurs by gravity, through the trim tank non-return valve. The FCMC:
- Inhibits the forward transfer by closing the TRIM PIPE ISOL VALVE, when the aircraft pitch exceeds 3.4 ° for more than one minute.
- Restarts the forward transfer, when the aircraft attitude is lower than 3.4 ° for more than 1 min.

Ident.: DSC-28-10-90-B-00000339.0001001 / 14 FEB 11

CENTER TANK EMPTY

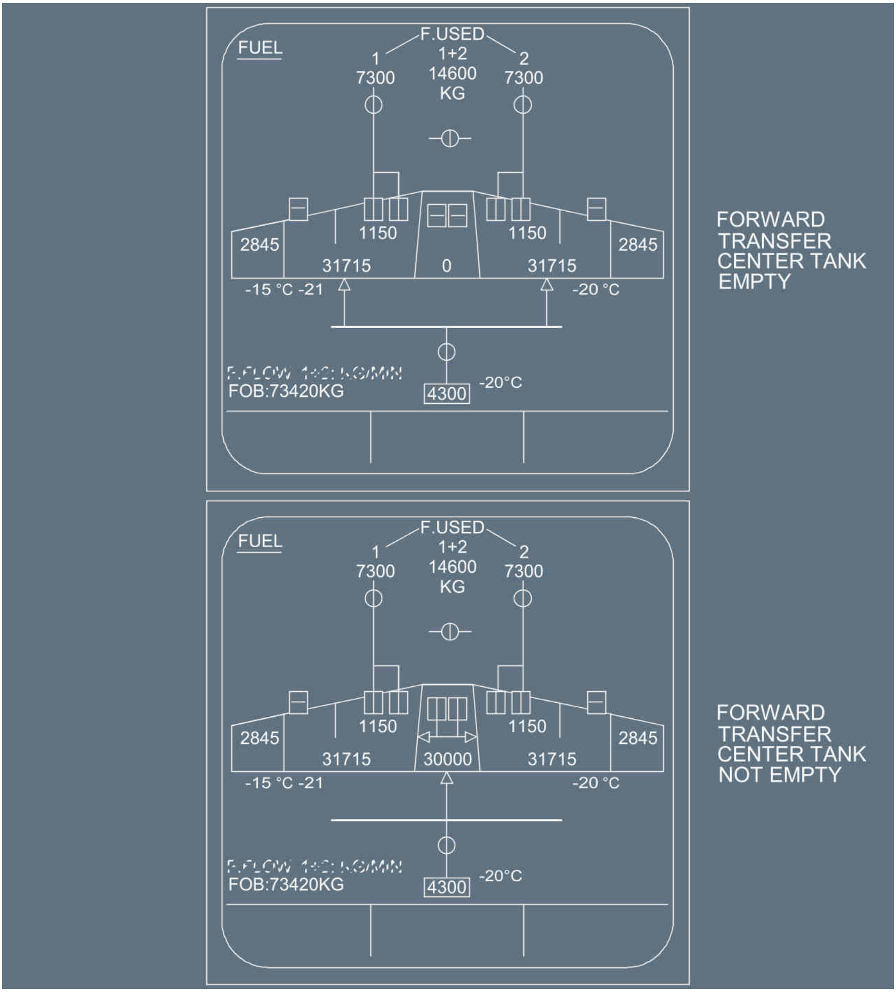
- Fuel is transferred from the trim tank to the inner tanks.
- If an inner tank reaches the high level, the related inlet valve closes to prevent tank overflow.
- It reopens when the inner tank quantity reaches 2 000 kg (4 415 lb) below high level.

Ident.: DSC-28-10-90-B-00000347.0001001 / 14 FEB 11

CENTER TANK NOT EMPTY

Fuel is transferred from the trim tank to the center tank.

ECAM INDICATION

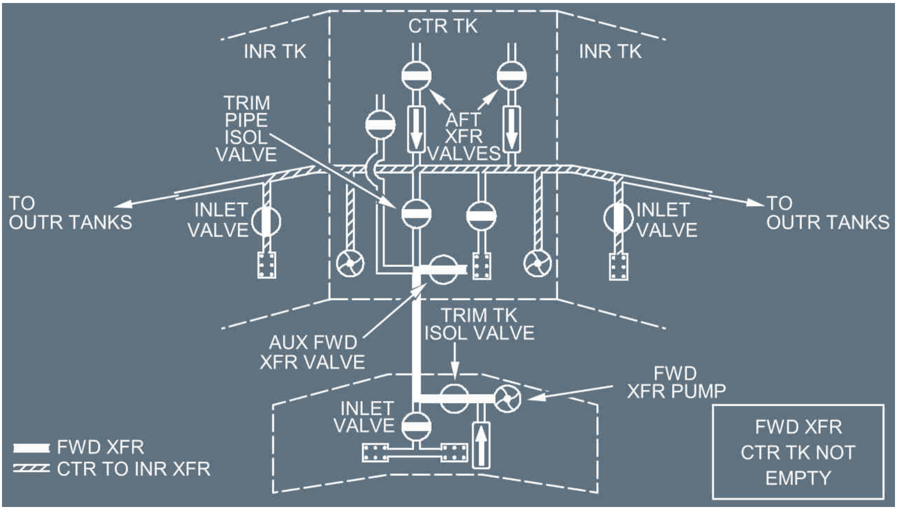

FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
2845
1150
31715
0
1150
31715
2845
-15 °C -21
-20 °C
F.FLOW 1+2: KG/MIN
FOB:73420KG
4300
-20°C
FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
2845
1150
31715
30000
1150
31715
2845
-15 °C -21
-20 °C
F.FLOW 1+2: KG/MIN
FOB:73420KG
4300
-20°C

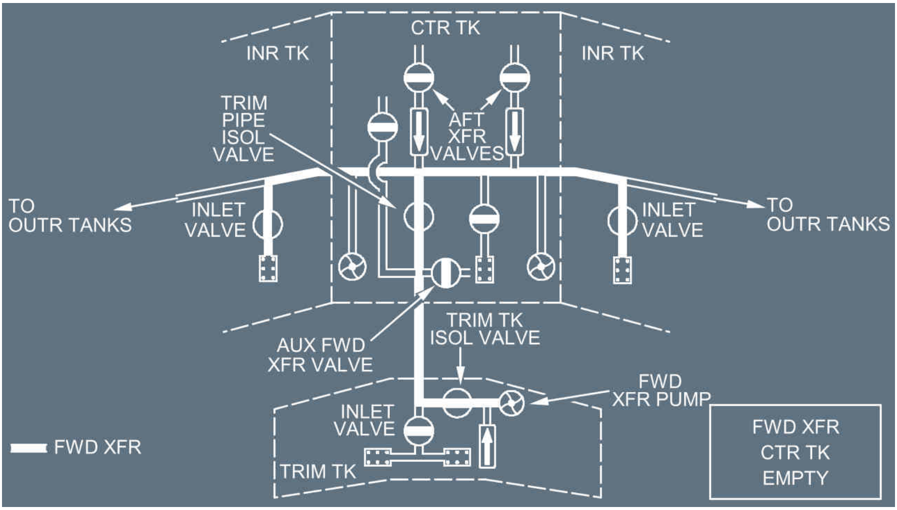
FORWARD TRANSFER CENTER TANK EMPTY

FORWARD TRANSFER CENTER TANK NOT EMPTY

Ident.: DSC-28-10-90-B-00000335.0002001 / 22 MAY 12

SCHEMATIC


CTR TK
INR TK
INR TK
TRIM PIPE ISOL VALVE
AFT XFR VALVES
TO OUTR TANKS
INLET VALVE
INLET VALVE
TO OUTR TANKS
TRIM TK ISOL VALVE
AUX FWD XFR VALVE
FWD XFR PUMP
INLET VALVE
FWD XFR
CTR TO INR XFR
FWD XFR CTR TK NOT EMPTY


CTR TK
INR TK
INR TK
TRIM PIPE ISOL VALVE
AFT XFR VALVES
TO OUTR TANKS
INLET VALVE
INLET VALVE
TO OUTR TANKS
TRIM TK ISOL VALVE
AUX FWD XFR VALVE
FWD XFR PUMP
INLET VALVE
TRIM TK
FWD XFR
FWD XFR CTR TK EMPTY

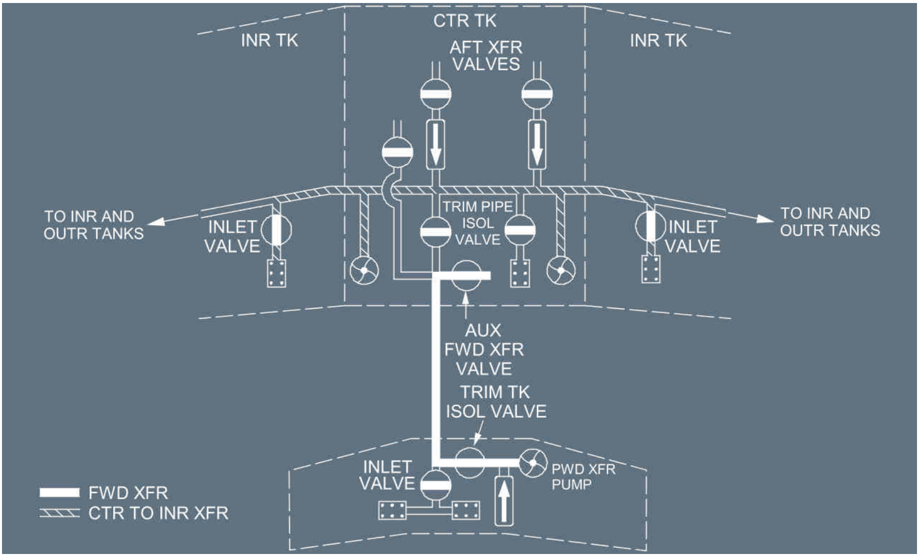
MANUAL FORWARD FUEL TRANSFER

Ident.: DSC-28-10-90-00000355.0006001 / 21 NOV 11
Applicable to: ALL

When the T. TANK pushbutton is pressed, the FWD light comes on white, and:

- The TRIM TK ISOL valve opens.
- The AUX FWD XFR valve opens.
- The TRIM PIPE ISOL valve closes.
- The two AFT XFR valves close.
- The trim tank forward transfer pump starts.

Fuel transfers from the trim tank to the center tank.
Center tank overflow must be manually prevented, by releasing the pushbutton when the tank is full.
When the T. TANK pushbutton is released, the forward transfer stops.


CTR TK
INR TK
INR TK
AFT XFR VALVES
TO INR AND OUTR TANKS
INLET VALVE
TRIM PIPE ISOL VALVE
INLET VALVE
TO INR AND OUTR TANKS
AUX FWD XFR VALVE
TRIM TK ISOL VALVE
INLET VALVE
PWD XFR PUMP
FWD XFR
CTR TO INR XFR

FWD APU PUMP FEED

Ident.: DSC-28-10-100-00000359.0003001 / 14 FEB 11
Applicable to: ALL

The APU is fed from the Engine 1 collector cells (in the left inner tank) through the APU FWD pump and the APU ISOL valve when :
- On the ground after 2 min (except during trim tank refueling), or
- In flight below FL 255, or
- In flight above FL 255, when the trim tank is empty.

In this case, the AFT APU pump is not running.

AFT APU PUMP FEED

Ident.: DSC-28-10-100-00000765.0002001 / 14 FEB 11
Applicable to: ALL

The APU is fed from the trim pipe :
- The first two minutes when on the ground, or
- During trim tank refueling or,
- During an aft transfer.

The APU is fed from the trim tank :
- In flight above FL 255, as long as the trim tank is not empty, or
- During a forward transfer.

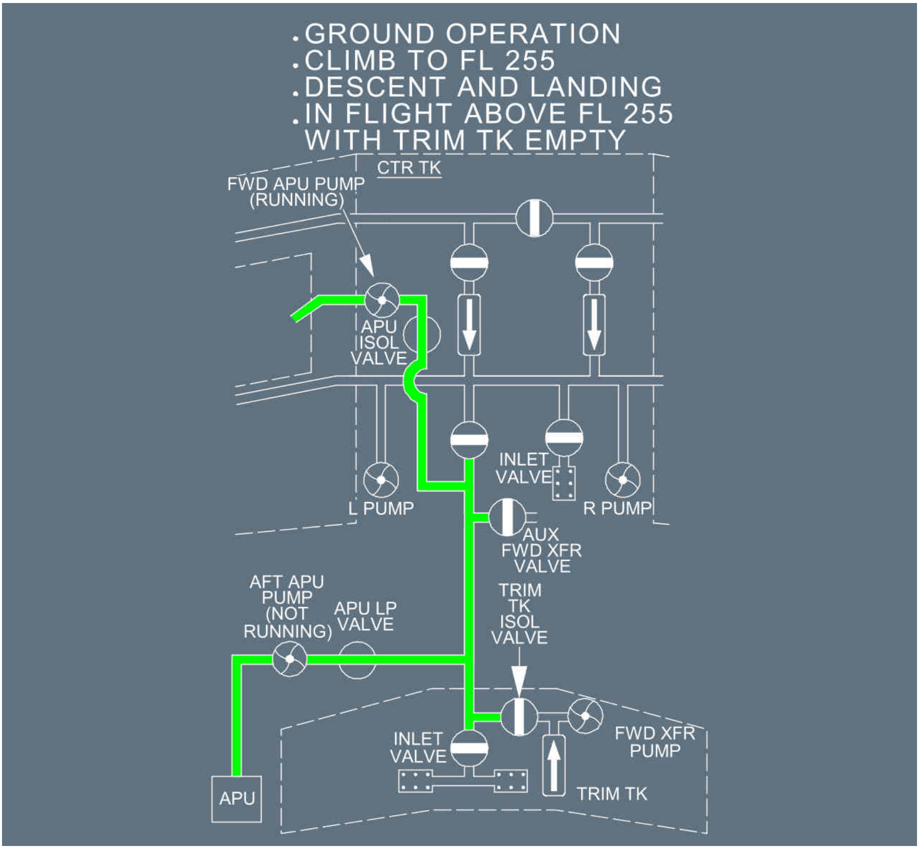
In the above cases, the :
- AFT APU pump is running.
- FWD APU pump is not running.
- APU ISOL valve is closed.

Note: *The AFT APU pump will automatically start, in the event of FWD APU pump failure.*

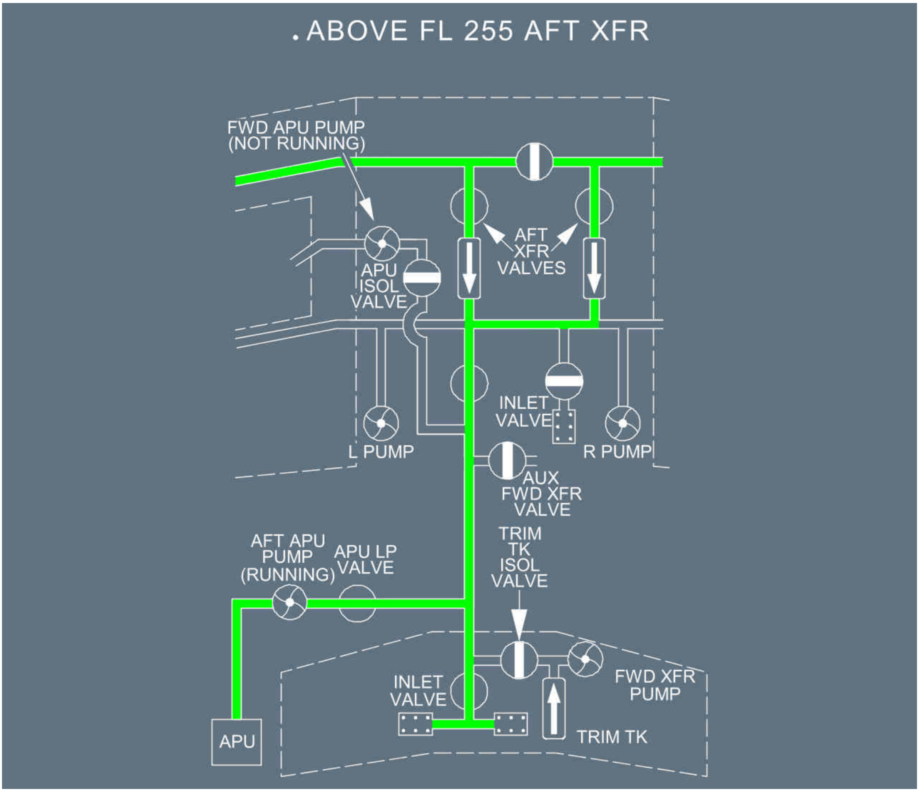
APU FEED

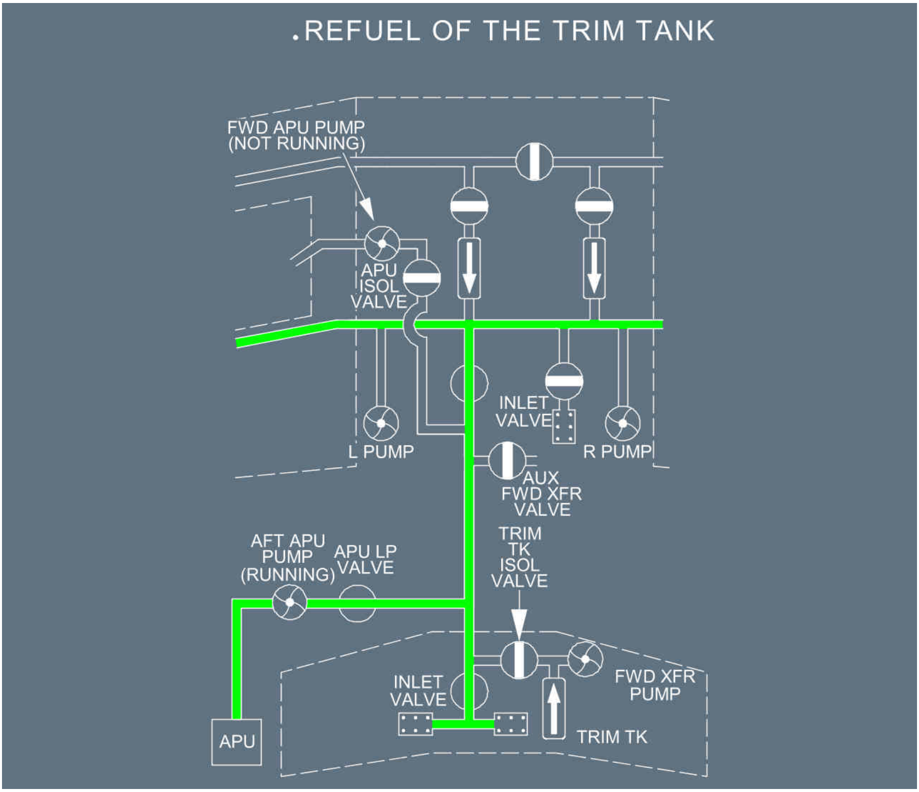
Ident.: DSC-28-10-100-00000772.0008001 / 22 MAY 12
Applicable to: ALL

LH INR TK

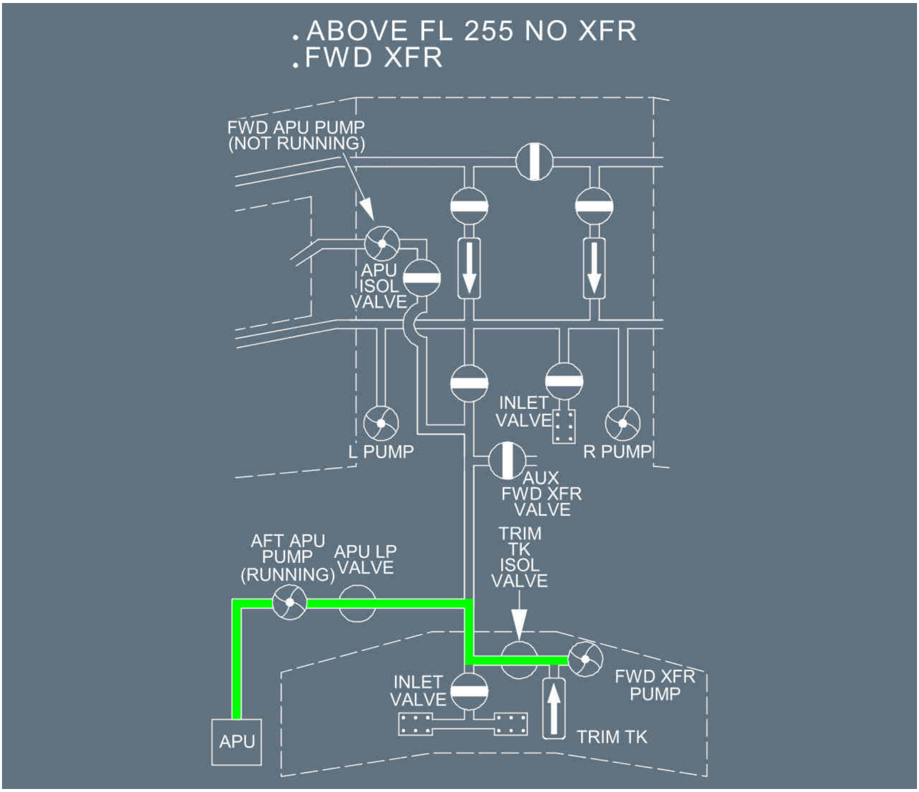

.GROUND OPERATION
.CLIMB TO FL 255
.DESCENT AND LANDING
.IN FLIGHT ABOVE FL 255
WITH TRIM TK EMPTY
CTR TK
FWD APU PUMP
(RUNNING)
APU
ISOL
VALVE
INLET
VALVE
L PUMP
R PUMP
AUX
FWD XFR
VALVE
TRIM
TK
ISOL
VALVE
AFT APU
PUMP
(NOT
RUNNING)
APU LP
VALVE
INLET
VALVE
FWD XFR
PUMP
TRIM TK
APU

TRIM PIPE


. ABOVE FL 255 AFT XFR
FWD APU PUMP
(NOT RUNNING)
AFT
XFR
VALVES
APU
ISOL
VALVE
INLET
VALVE
L PUMP
R PUMP
AUX
FWD XFR
VALVE
TRIM
TK
ISOL
VALVE
AFT APU
PUMP
(RUNNING)
APU LP
VALVE
FWD XFR
PUMP
INLET
VALVE
APU
TRIM TK


.REFUEL OF THE TRIM TANK
FWD APU PUMP
(NOT RUNNING)
APU
ISOL
VALVE
INLET
VALVE
L PUMP
R PUMP
AUX
FWD XFR
VALVE
TRIM
TK
ISOL
VALVE
AFT APU
PUMP
(RUNNING)
APU LP
VALVE
INLET
VALVE
FWD XFR
PUMP
TRIM TK
APU

TRIM TANK

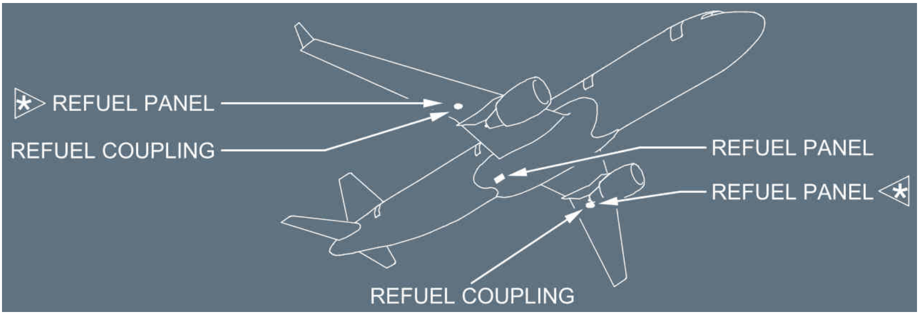

.ABOVE FL 255 NO XFR
.FWD XFR
FWD APU PUMP
(NOT RUNNING)
APU
ISOL
VALVE
INLET
VALVE
L PUMP
R PUMP
AUX
FWD XFR
VALVE
TRIM
TK
ISOL
VALVE
AFT APU
PUMP
(RUNNING)
APU LP
VALVE
FWD XFR
PUMP
INLET
VALVE
APU
TRIM TK

Intentionally left blank

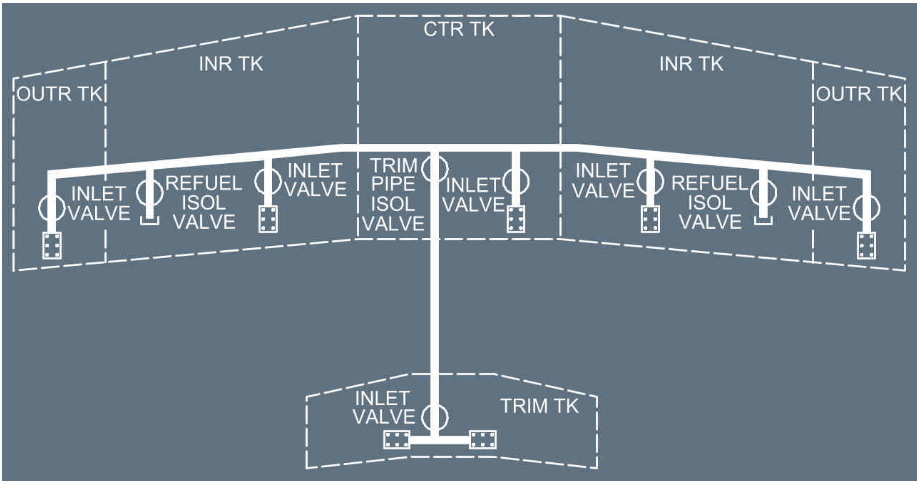
REFUELING-DEFUELING

Ident.: DSC-28-10-110-00000776.0005001 / 20 MAR 17
Applicable to: ALL

During automatic refueling, the trim tank is filled when the preselected fuel quantity is greater than 36 500 kg, whatever the density.
Two refuel couplings are installed under the wings. These couplings allow refueling from both the right and left sides of the aircraft.
A refuel panel is located on the fuselage side, beneath the right wing.
A second and/or third panel ◁✳ is installed close to the refuel couplings.
A gallery connects the refueling coupling to the fuel inlet valve of each tank.



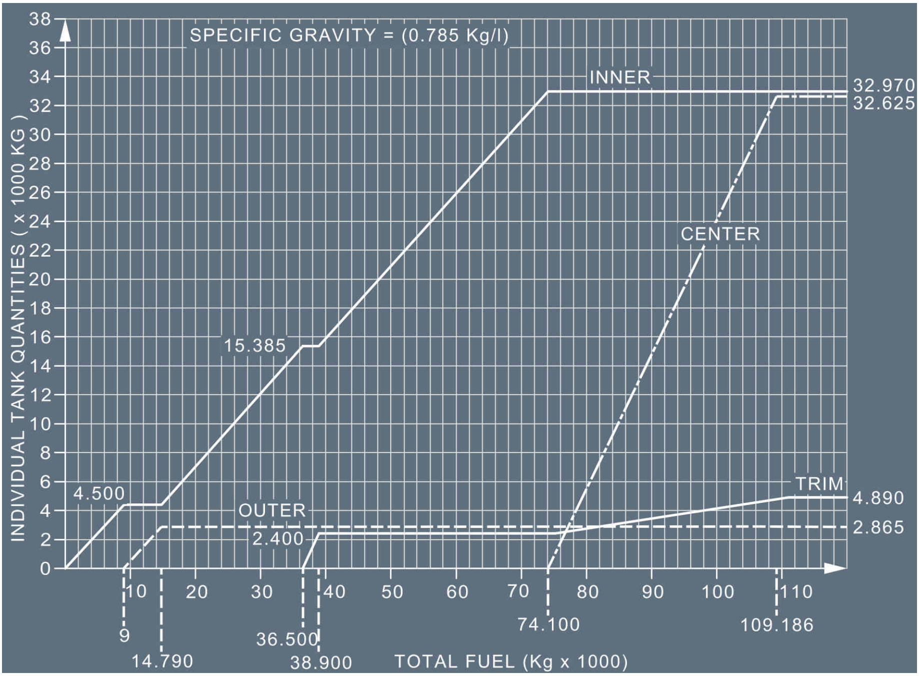
From the cockpit, refueling can be controlled with the refuel pushbutton ◁✳ . Although manual control is possible, it is normally automatic when the required fuel load is set on the preselector. In addition, it is possible to refuel by battery power only.
Any tanks that require refueling, start to be refueled simultaneously. Refuel valves automatically close, either when the required quantity is reached, or when high level is detected.
Wing tank gravity refueling is achieved via overwing refueling points. If the FCMC is powered, transfer is possible from any tank (with inner or center pumps) to outer, inner or center tanks. When both side couplings are used, the refueling time at nominal pressure (50 PSI) is approximately 33 min for all tanks.


CTR TK
INR TK
INR TK
OUTR TK
OUTR TK
INLET VALVE
REFUEL ISOL VALVE
INLET VALVE
TRIM PIPE ISOL VALVE
INLET VALVE
INLET VALVE
REFUEL ISOL VALVE
INLET VALVE
INLET VALVE
TRIM TK

GENERAL - REFUEL DISTRIBUTION

Ident.: DSC-28-10-110-00001467.0023001 / 12 SEP 17
Applicable to: ALL

REFUEL DISTRIBUTION



The required FOB is 100 000 kg

Post refuel distribution :
OUTERS (each) 2 865 kg
INNERS (each) 32 970 kg
CENTER 24 230 kg
TRIM 4 100 kg

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GENERAL

Ident.: DSC-28-10-120-00000838.0015001 / 14 FEB 11
Applicable to: LV-KAN, LV-KAO

The Jettison system:
- Makes it possible to jettison fuel in flight.
- Output rate is approximate 1 000 kg (2 200 lb) per minute, excluding fuel burn.
- Is manually activated by two JETTISON pushbuttons, located on the overhead panel. Both pushbuttons must be pressed to select the jettison.

Fuel is simultaneously jettisoned from the inner and the center tanks.

When the crew starts the jettison operation:
- The crossfeed valve opens.
- All main and standby pumps run.

An automatic forward transfer into the center tank is initiated, even if the slats are out, the landing gear is down, and whatever the altitude.
An automatic fuel transfer from the outer tank to the inner tank is also initiated to enable the fuel in the outer tank to be jettisoned.

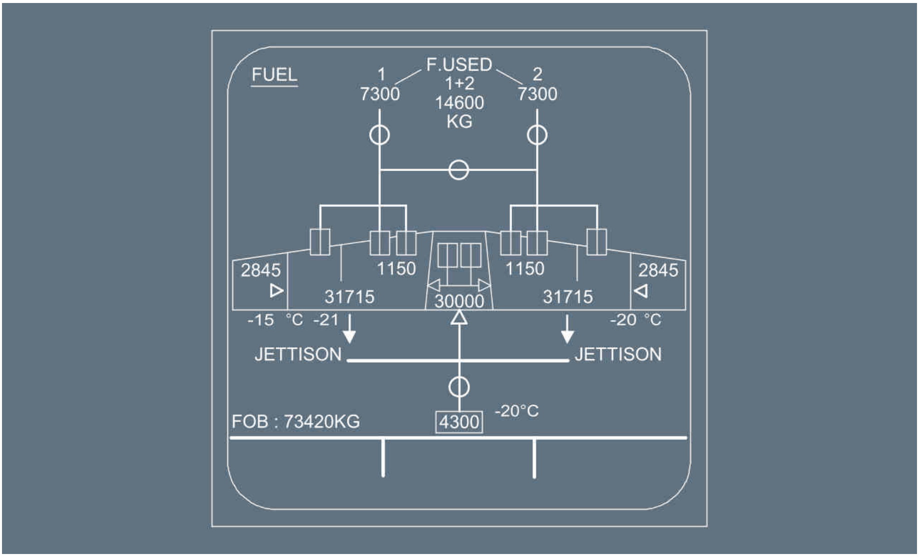
Note: *In case of the trim tank pump failure, forward transfer is by gravity, as long as the pitch attitude is below 3 °.*

The jettison operation continues, until one of the following occurs:
- The crew stops the operation.
- Both inner fuel tank low level sensor on one side become dry.
- The Fuel Control and Monitoring System (FCMS) stops the operation at a fuel content level preset on the FMGES MCDU.
- The combined inner tank fuel quantity is less than 10 000 kg (22 000 lb).

Note: *The standby pumps continue to run, as long as both JETTISON pushbuttons are selected ON.*

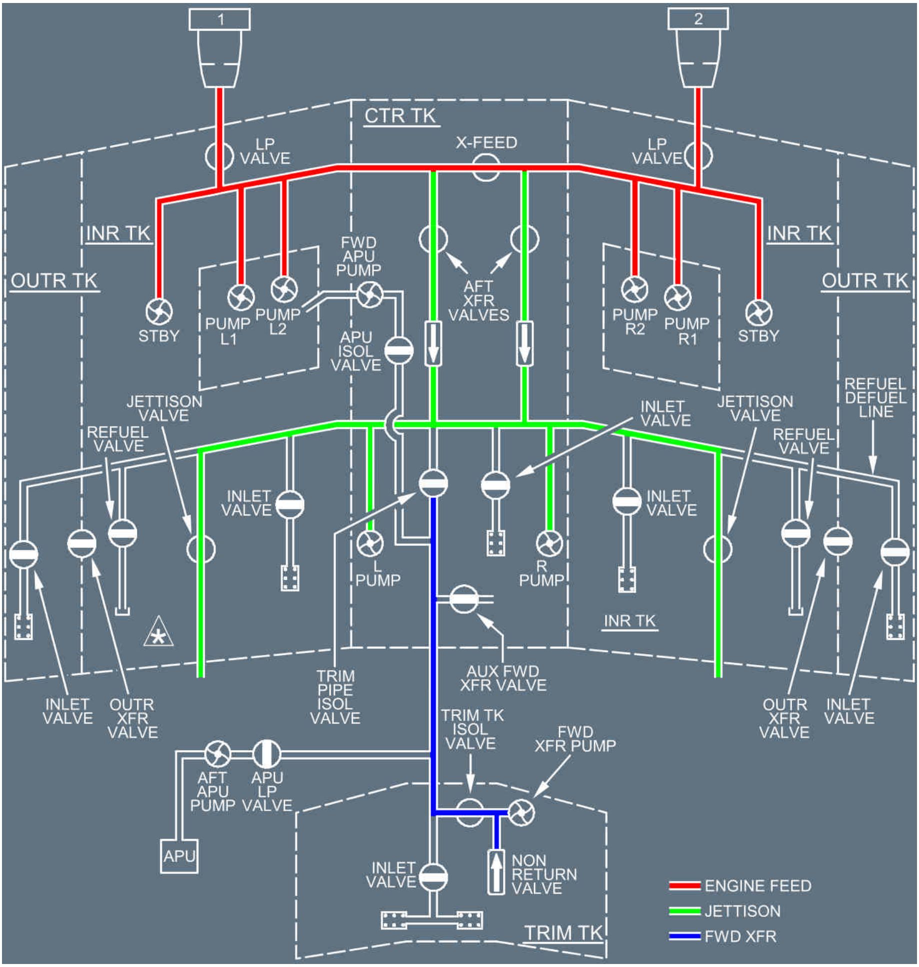
ECAM INDICATION

Ident.: DSC-28-10-120-00000842.0023001 / 09 OCT 12
Applicable to: LV-KAN, LV-KAO


FUEL
1
7300
F.USED
1+2
14600
KG
2
7300
2845
1150
31715
30000
1150
31715
2845
-15 °C -21
-20 °C
JETTISON
JETTISON
FOB : 73420KG
4300
-20°C

SCHEMATIC

Ident.: DSC-28-10-120-00000847.0010001 / 09 OCT 12
Applicable to: LV-KAN, LV-KAO


1
2
CTR TK
LP VALVE
X-FEED
LP VALVE
INR TK
INR TK
FWD APU PUMP
OUTR TK
OUTR TK
AFT XFR VALVES
STBY
PUMP L1
PUMP L2
PUMP R2
PUMP R1
STBY
APU ISOL VALVE
JETTISON VALVE
INLET VALVE
JETTISON VALVE
REFUEL DEFUEL LINE
REFUEL VALVE
REFUEL VALVE
INLET VALVE
INLET VALVE
L PUMP
R PUMP
INR TK
AUX FWD XFR VALVE
TRIM PIPE ISOL VALVE
INLET VALVE
OUTR XFR VALVE
OUTR XFR VALVE
INLET VALVE
TRIM TK ISOL VALVE
FWD XFR PUMP
AFT APU PUMP
APU LP VALVE
APU
INLET VALVE
NON RETURN VALVE
TRIM TK
ENGINE FEED
JETTISON
FWD XFR

Intentionally left blank

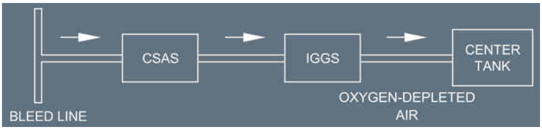
FUEL TANK INERTING SYSTEM

Ident.: DSC-28-10-140-00013685.0003001 / 21 AUG 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

The A330 and A340 aircraft are equipped with a Fuel Inerting System.
The aim of this system is to reduce the flammability in the fuel tanks than have a high flammability exposure.
The fuel center tank is the only one that has a high flammability exposure. Therefore, the Fuel Inerting System only needs to be installed for the center tank. All other tanks do not need Fuel Inerting System installation.
To reduce the flammability in the center tank, the Fuel Inerting System produces an oxygen-depleted air that goes in the center tank to replace the ambient air.

The system is installed in the belly fairing of the aircraft, and is composed by:
- A conditioned Service Air System (CSAS)
- An Inert Gas Generation System (IGGS).

The CSAS extracts and conditions some engine bleed air to adequate pressure and temperature. Then, the air goes through the IGGS where an Air Separation Module taps the nitrogen molecules. Therefore, an oxygen-depleted air is produced (with less than 12 % of oxygen) and replaces the ambient air of the center tank.



The Fuel Inerting System does not require any flight crew action. It works independently as soon as the engines started and until they stop.

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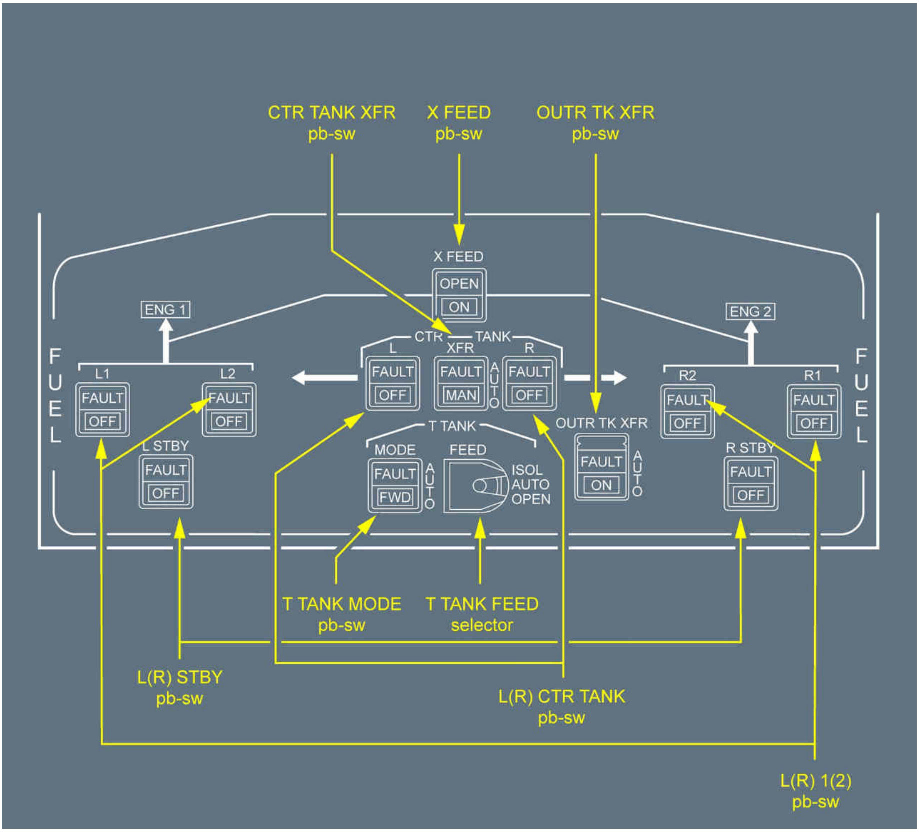
OVERHEAD PANEL

Applicable to: ALL

Ident.: DSC-28-20-H-00020032.0009001 / 17 MAR 17


CTR TANK XFR pb-sw
X FEED pb-sw
OUTR TK XFR pb-sw
X FEED
OPEN
ON
ENG 1
ENG 2
F U E L
L1
L2
FAULT
OFF
CTR TANK
L
XFR
R
FAULT
MAN
AUTO
R2
R1
OUTR TK XFR
FAULT
ON
AUTO
L STBY
R STBY
T TANK
MODE
FEED
FWD
ISOL
AUTO
OPEN
T TANK MODE pb-sw
T TANK FEED selector
L(R) STBY pb-sw
L(R) CTR TANK pb-sw
L(R) 1(2) pb-sw

Ident.: DSC-28-20-H-00020050.0001001 / 17 MAR 17

L(R) 1(2) pb-sw

On	:	Pump is on.
OFF	:	Pump is off.
FAULT light	:	The amber light and the ECAM caution come on, when the delivered pressure drops. It is inhibited when OFF is selected.

Ident.: DSC-28-20-H-00020051.0001001 / 17 MAR 17

L(R) STBY pb-sw

On : Standby pump runs when associated main pump is failed or off.

OFF : Pump is off.

FAULT light : The amber light and the ECAM caution come on, when the delivered pressure drops. It is inhibited when OFF is selected, or the main pump is running.

Ident.: DSC-28-20-H-00020061.0001001 / 17 MAR 17

L(R) CTR TK pb-sw

On : The center tank pump runs permanently. Appropriate valves control the transfer. The pump stops automatically, when the tank is empty.

OFF : The pump is off.

FAULT light : The amber light and the ECAM caution come on, when:
- The delivery pressure drops, or
- The trim pipe ISOL valve is failed open, or
- A manual transfer from the center tank is required (failure of automatic transfer) and both inner tank quantities are above 17 000 kg (37 520 lb), or
- One outer or inner inlet valve is failed open and both inner tank quantities are above 17 000 kg (37 520 lb).

It is inhibited when OFF position is selected.

Ident.: DSC-28-20-H-00020052.0001001 / 17 MAR 17

T TANK MODE pb-sw

AUTO : The FCMC controls the CG.

FWD : Initiates a manual forward transfer to the center tank, by opening:
- The trim tank ISOL valve,
- The auxiliary forward transfer valve.

And by closing:
- The trim pipe ISOL valve,
- The aft transfer valves.
  And, by operating the trim tank forward transfer pump ◁✻ .

Center tank overflow must be manually prevented.

FAULT light : The amber light and the ECAM caution come on when:
- The FMGS detects an excess aft CG, based on the THS position (independent of fuel quantity), or
- The FCMC is unable to carry out the forward transfer, or
- The FUEL LO TEMP warning is triggered.

Ident.: DSC-28-20-H-00020053.0001001 / 21 MAR 17

T TANK FEED selector

AUTO	:	Stops the forward transfer when the trim tank is at low level, to maintain the transfer line full.
ISOL	:	The transfer line is isolated as the following valves close: - Trim tank ISOL valve, - Trim tank inlet valve, - Auxiliary forward transfer valve, - Trim pipe isolation valve. The trim tank forward transfer pump stops.
OPEN	:	The valves used during a manual forward transfer, and the trim tank inlet valve open. The valves remain open, until 3 min after the trim tank is low, to allow drainage of the transfer pipe.

Note: APU supply is not possible, when the pipe is drained.

Ident.: DSC-28-20-H-00020054.0001001 / 09 MAR 18

OUTR TK XFR pb-sw (GUARDED)

ON	:	Initiates the outer to inner tank transfer by opening: - The outer transfer valves, - The outer inlet valves, - The inner inlet valves.
AUTO	:	The FCMC controls the outer to inner tank transfer.
FAULT light	:	The amber light, and the ECAM caution come on, when: - The inner tank low level is reached and the outer tanks are not empty, or - The FCMC is unable to carry out the transfer to the inner tanks, or - The FUEL LO TEMP warning is triggered.

Ident.: DSC-28-20-H-00020057.0003001 / 17 MAR 17

X FEED pb-sw

ON	:	The valve opens.
AUTO	:	The valve automatically opens in electrical emergency configuration.
OPEN light	:	The green light comes on when the valve is fully open.

Ident.: DSC-28-20-H-00020060.0005001 / 17 MAR 17

CTR TANK XFR pb-sw

AUTO	:	The FCMC controls the center to inner tank transfer.

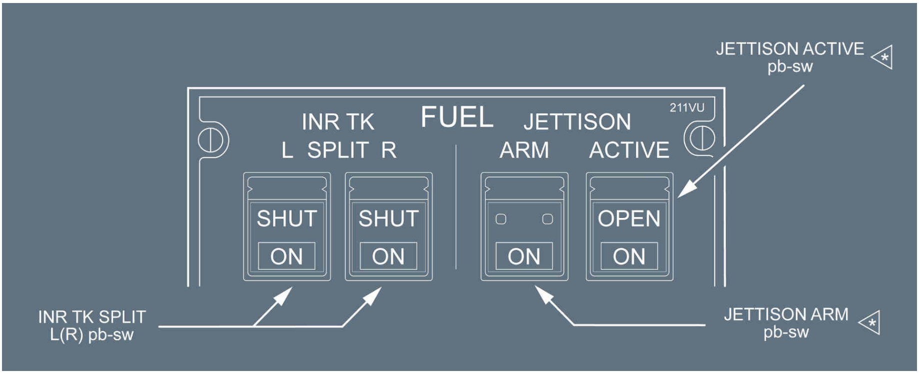
MAN : Initiates the center to inner tank transfer by opening the inner tank inlet valves.
To avoid inner tank overflow, the center tank pumps may be selected off.

FAULT light : The amber light and the ECAM caution come on when:
- The inner tank low level is reached and the center tank is not empty, or
- The FCMC is unable to carry out the transfer to the inner tanks.

OVERHEAD PANEL (CONT'D)

Applicable to: ALL

Ident.: DSC-28-20-I-00020033.0001001 / 17 MAR 17


JETTISON ACTIVE ◁
pb-sw
211VU
INR TK
L SPLIT R
FUEL
JETTISON
ARM
ACTIVE
SHUT
ON
SHUT
ON
ON
OPEN
ON
INR TK SPLIT
L(R) pb-sw
JETTISON ARM ◁
pb-sw

Ident.: DSC-28-20-I-00020069.0001001 / 21 MAR 17

INR TK SPLIT L(R) pb-sw (GUARDED)

ON : The valve closes and the inner tank is split into two parts.
- The fuel may be used from either inner tank division.

The light comes on amber.

Off : The split valve (inner tank division) is open.
The inner tank is used as a single tank.

SHUT : The light comes on blue, when the valve is shut.

Ident.: DSC-28-20-I-00020070.0001001 / 21 MAR 17

JETTISON ARM pb-sw ◁ (GUARDED IN OFF)

ON : Jettison is armed, and can be activated with the ACTIVE pb-sw.

Off : Jettison is disarmed.

Ident.: DSC-28-20-I-00020077.0001001 / 21 MAR 17

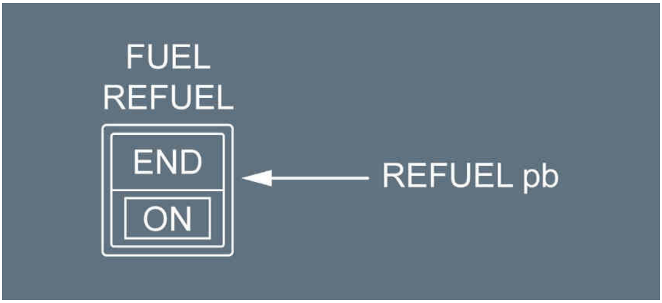
JETTISON ACTIVE pb-sw ◁ (GUARDED IN OFF)

ON : Jettison is activated, provided that the ARM pb-sw is set to ON.
Off : Jettison is not active.
OPEN light : Comes on, when the jettison valves are open.

MAINTENANCE PANEL

Applicable to: LV-KAN, LV-KAO

Ident.: DSC-28-20-C-00020034.0001001 / 17 MAR 17



Ident.: DSC-28-20-C-00020078.0001001 / 17 MAR 17

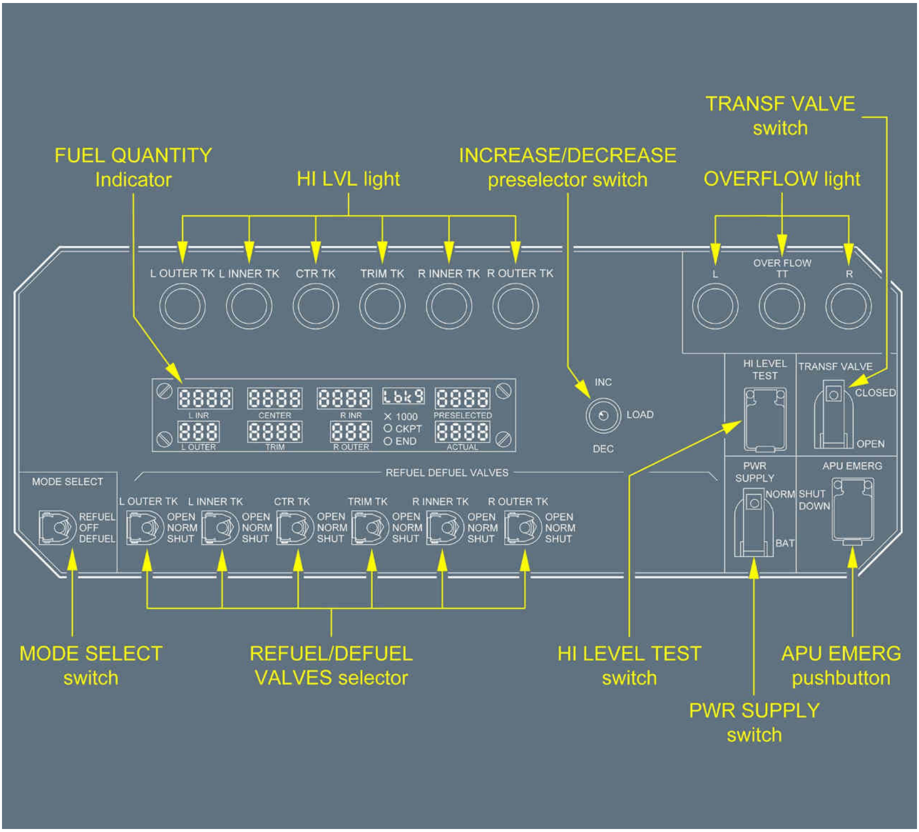
FUEL/REFUEL pb

ON : Refueling starts, depending on the BLOCK FUEL quantity displayed on the FMGS MCDU INIT B page.
END light : Indicates that refueling is completed.
Flashes when refueling is aborted, when the high level test is negative, or when there is an imbalance of greater than 3 000 kg (6 620 lb) after refueling.

REFUELING CONTROL PANEL

Applicable to: ALL

Ident.: DSC-28-20-D-00020049.0001001 / 17 MAR 17


TRANSF VALVE switch
FUEL QUANTITY Indicator
HI LVL light
INCREASE/DECREASE preselector switch
OVERFLOW light
L OUTER TK
L INNER TK
CTR TK
TRIM TK
R INNER TK
R OUTER TK
OVER FLOW
L
TT
R
8888
8888
8888
Lbk9
8888
L INR
CENTER
R INR
× 1000
PRESELECTED
888
8888
888
8888
L OUTER
TRIM
R OUTER
○ CKPT
○ END
ACTUAL
INC
LOAD
DEC
HI LEVEL TEST
TRANSF VALVE
CLOSED
OPEN
MODE SELECT
REFUEL
OFF
DEFUEL
REFUEL DEFUEL VALVES
L OUTER TK
L INNER TK
CTR TK
TRIM TK
R INNER TK
R OUTER TK
OPEN
NORM
SHUT
PWR SUPPLY
NORM
BAT
APU EMERG
SHUT DOWN
MODE SELECT switch
REFUEL/DEFUEL VALVES selector
HI LEVEL TEST switch
APU EMERG pushbutton
PWR SUPPLY switch

Ident.: DSC-28-20-D-00020080.0001001 / 21 MAR 17

FUEL QUANTITY INDICATOR

Displays, in kg (or lbs) × 1000 :

- The fuel quantity of each tank.
- The pre-selected total quantity. At electrical power up (or FCMC reset), the display shows the ACTUAL value minus 500 kg (1 100 lb). Otherwise, the last pre-selected value is displayed.
- The actual total fuel on board.

- The applicable units (kg or lbs).
- The CKPT light : Comes on when a BLOCK FUEL value has been entered and confirmed on the cockpit MCDU.
- The END light, which flashes when :
  - There is an imbalance greater than 3 000 kg (6 620 lb), after refueling.
  - A failure is detected during a high level test.
  - Refueling is aborted.

  Once refueling is finished, the END light stays on.

Ident.: DSC-28-20-D-00020081.0001001 / 21 MAR 17

HI LVL light

Comes on blue, when high level is detected (i.e. both high level sensors are wet).
The corresponding refuel valve automatically closes.

Ident.: DSC-28-20-D-00020082.0001001 / 21 MAR 17

OVERFLOW light

Comes on amber, when the associated vent tank overflow sensor is covered with fuel.

Ident.: DSC-28-20-D-00020083.0001001 / 17 MAR 17

INCREASE/DECREASE preselector sw

Pressing either side of the switch increases or decreases the preselected quantity.

Ident.: DSC-28-20-D-00020084.0001001 / 21 MAR 17

TRANSF VALVE sw (GUARDED IN CLOSED)

CLOSED : Transfer valves are closed.
OPEN : If the inner tank pumps are on for ground transfer, the aft transfer valves open. The trim tank inlet valve closes.

Ident.: DSC-28-20-D-00020085.0001001 / 21 MAR 17

APU EMERG pb (GUARDED)

When pressed, it initiates the APU shutdown sequence.

Ident.: DSC-28-20-D-00020086.0001001 / 21 MAR 17

POWER SUPPLY sw (GUARDED IN NORM)

NORM : Refueling / Defueling can be supplied either by external power or with the APU generator on line.
BAT : Refueling / Defueling is battery-powered.

Ident.: DSC-28-20-D-00020087.0001001 / 21 MAR 17

HIGH LEVEL TEST sw (GUARDED)

During the test :
- Refueling stops.
- HI LEVEL and OVERFLOW lights come on, if their circuits are serviceable.
- CKPT and END lights come on.
- The PRESELECTED and ACTUAL fuel quantity display all 8 s.

If a failure occurs during the high level test :
- The END light flashes and remains flashing after completion.
- The affected HI LVL light remains on.

Ident.: DSC-28-20-D-00020088.0001001 / 21 MAR 17

REFUEL/DEFUEL VALVES selector (GUARDED IN NORM)

NORM : Refuel / Defuel valves are automatically controlled.

OPEN : Valves open when the MODE SELECT switch is set to the REFUEL or DEFUEL position. In the REFUEL position, each refuel/defuel valve closes when high level is detected in the associated tank.

SHUT : Valves close.

Ident.: DSC-28-20-D-00020098.0001001 / 21 MAR 17

MODE SELECT sw (GUARDED AT OFF)

OFF : Refueling system is off.
Refuel valves close.
APU emergency shutdown and high level test remain available.

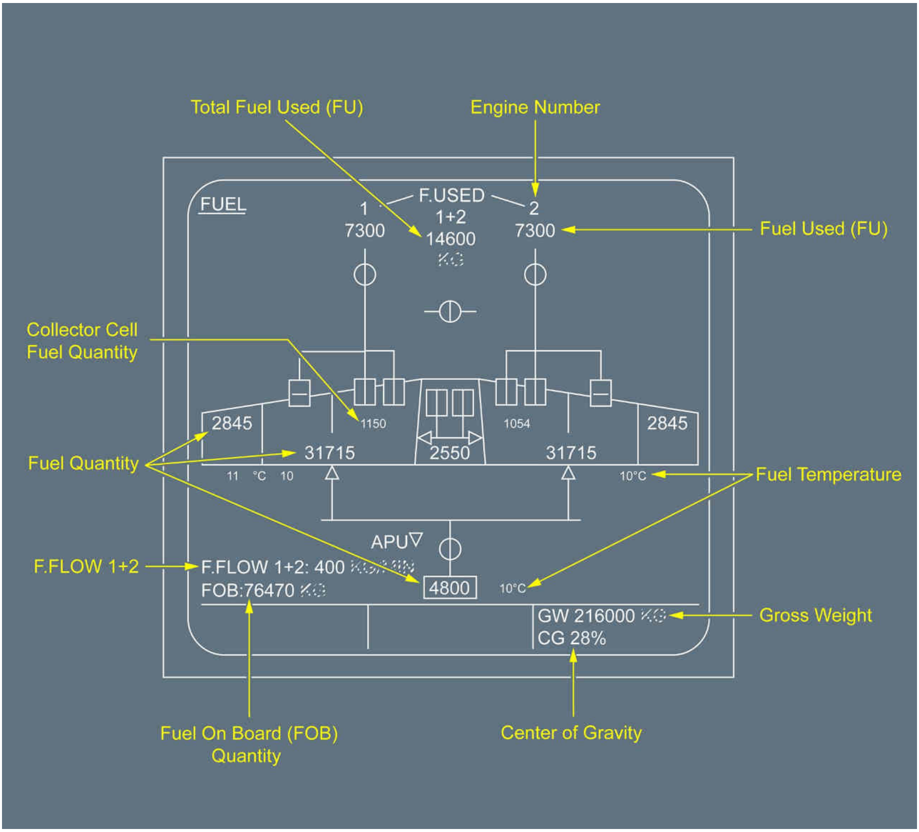
REFUEL : Refuel valves operate in automatic or manual mode, depending on the REFUEL / DEFUEL VALVES switch position.

DEFUEL : Refuel valves are open.

FUEL QTY, TEMP, GW AND CG INDICATIONS

Applicable to: ALL

Ident.: DSC-28-20-F-00020036.0025001 / 21 MAR 17


Total Fuel Used (FU)
Engine Number
FUEL
F.USED
1+2
14600
KG
1
7300
2
7300
Fuel Used (FU)
Collector Cell Fuel Quantity
2845
1150
1054
2845
Fuel Quantity
31715
2550
31715
11 °C 10
10°C
Fuel Temperature
APU
F.FLOW 1+2
F.FLOW 1+2: 400 KG/MIN
FOB:76470 KG
4800
10°C
GW 216000 KG
CG 28%
Gross Weight
Fuel On Board (FOB) Quantity
Center of Gravity

Ident.: DSC-28-20-F-00020106.0001001 / 21 MAR 17

FUEL USED (FU) INDICATION (PER ENGINE)

- It is normally green.
- If the fuel flow detection system fails, the FADEC computes a synthetic FU value.

- When this computed value is considered erroneous by more than 136 kg (300 lb), the displayed value is crossed out with two amber bars.
- Units may either be in KG or LB, depending on the DMC pin program.

Ident.: DSC-28-20-F-00020107.0001001 / 17 MAR 17

TOTAL FUEL USED (FU) INDICATION

- It is normally green.
- When either “engine fuel used” is crossed, two amber bars appear across the value.
- Units may either be in KG or LB, depending on the DMC pin program.

Ident.: DSC-28-20-F-00020108.0001001 / 17 MAR 17

FUEL QUANTITY INDICATION

- It is normally green.
- When the fuel quantity indication is not accurate, two amber bars appear across the last two digits.
- If the fuel is unusable (trim or outer tanks only), the quantity indication is displayed in an amber box.
- A partial amber box appears, if 15 t of the center tank fuel is unusable.
- The fuel quantity indication of the inner tanks becomes amber, in case of low level or overflow.
- In the case of imbalance of more than 3 000 kg (6 622 lb) between the left wing tank and right wing tanks, the fuel quantity pulses in the inner and outer tanks.
- Units may either be in KG or LB, depending on the DMC pin program.

Ident.: DSC-28-20-F-00020109.0001001 / 17 MAR 17

COLLECTOR CELL FUEL QUANTITY INDICATION

- It is normally green.
- When the fuel quantity indication is not accurate, two amber bars appear across the last two digits.
- Units may either be in KG or LB, depending on the DMC pin program.

Ident.: DSC-28-20-F-00020110.0001001 / 17 MAR 17

FUEL ON BOARD (FOB) QUANTITY INDICATION

- It is normally green.
- In case of degraded accuracy, the last two digits are dashed.
- Units may either be in KG or LB, depending on the DMC pin program.

Note: *In case any tank’s fuel is partially not usable, the quantity indication is displayed in a partial amber box.*

Ident.: DSC-28-20-F-00020111.0001001 / 17 MAR 17

GROSS WEIGHT INDICATION

- It is normally green.
- When the fuel quantity indication is not accurate, two amber bars appear across the last two digits.
- When the gross weight is not computed on ground, blue dashes appear.
- Units may either be in KG or LB, depending on the DMC pin program.

Ident.: DSC-28-20-F-00020112.0001001 / 17 MAR 17

CENTER OF GRAVITY (CG) INDICATION

- It is normally green.
- When the FMGEC (FE part) detects an excess aft CG, it comes on red.
- When the CG is not computed on ground, blue dashes appear.

Ident.: DSC-28-20-F-00020113.0001001 / 17 MAR 17

FUEL TEMPERATURE INDICATION

- It is normally green.
- It is amber in the following cases:
  - Inner tanks: Above 49 °C in flight, or 45 °C on ground.
  - Outer or trim tanks: Below -40 °C.
  - Inner tanks: Below -37 °C.
- It disappears, when the tank quantity is below:
  - 1 000 kg (2 200 lb) for the trim tank.
  - 1 100 kg (2 420 lb) for the outer tank.

Note: *Fuel temperature is not indicated for the right outer tank.*

Ident.: DSC-28-20-F-00020114.0001001 / 17 MAR 17

ENGINE (ENG) NUMBER

- It is white, when the ENG is running.
- It is amber, when the ENG is not running.

Ident.: DSC-28-20-F-00020115.0003001 / 17 MAR 17

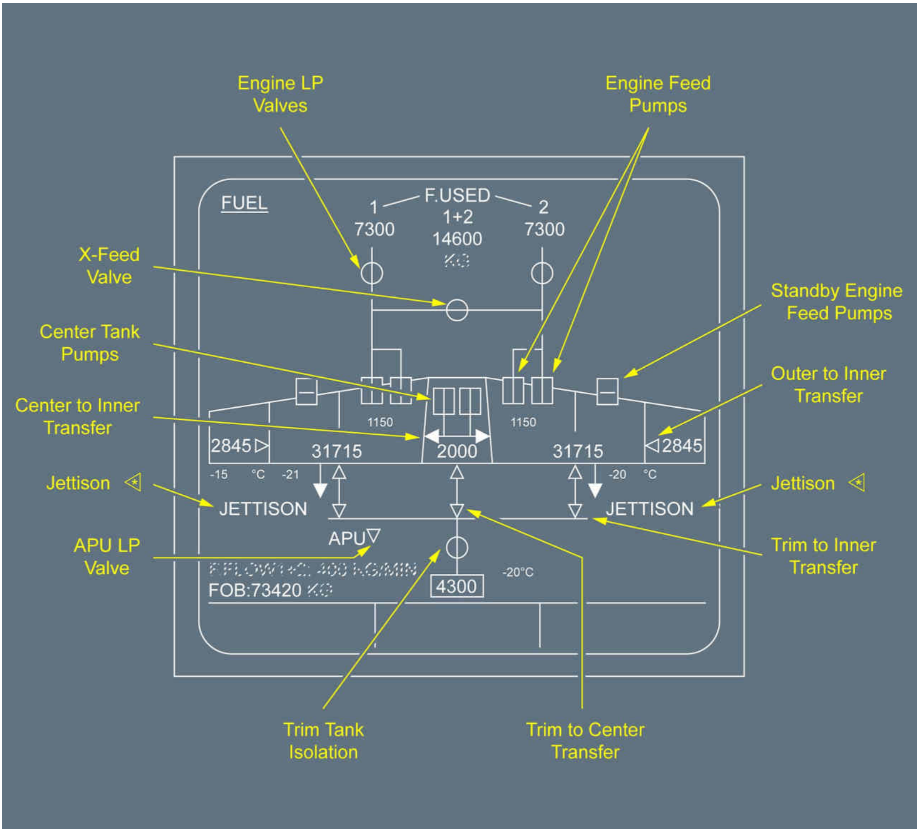
F. FLOW 1+2 INDICATION

- It is in green.
- It is displayed using ECU or EEC indications.
- Units may either be in KG/MIN or LB/MIN, depending on the DMC pin program.

FUEL FEED, TRANSFER AND JETTISON (IF-INSTALLED) INDICATIONS

Applicable to: ALL

Ident.: DSC-28-20-G-00020041.0010001 / 21 MAR 17


Engine LP Valves
Engine Feed Pumps
FUEL
F.USED
1
2
1+2
7300
14600
7300
KG
X-Feed Valve
Standby Engine Feed Pumps
Center Tank Pumps
Outer to Inner Transfer
Center to Inner Transfer
1150
1150
2845
31715
2000
31715
2845
-15 °C -21
-20 °C
Jettison
Jettison
JETTISON
JETTISON
APU LP Valve
Trim to Inner Transfer
APU
F.FLOW 1+2: 400 KG/MIN
FOB:73420 KG
-20°C
4300
Trim Tank Isolation
Trim to Center Transfer

Ident.: DSC-28-20-G-00020117.0001001 / 17 MAR 17

ENGINE LP VALVES INDICATION

In line - Green	:	Valve is open.
In line - Amber	:	Valve is abnormally open.
Cross line - Amber	:	Valve is closed.
Transit - Amber	:	Valve is in transit.

Ident.: DSC-28-20-G-00020118.0001001 / 17 MAR 17

ENGINE FEED PUMPS INDICATION

In line - Green : Pump is running.
In line - Amber : Pump abnormally running.
Cross line - Amber : Pump not running.
"LO" - Amber : Pump pressure is low. Pump is on.

Ident.: DSC-28-20-G-00020119.0001001 / 17 MAR 17

STANDBY PUMPS INDICATION

Identical to the normal pump, except when pump is not running.

Cross line - Green : Pump not running.
Cross line - Amber : Pump abnormally not running.

Ident.: DSC-28-20-G-00020120.0001001 / 17 MAR 17

OUTER TO INNER TRANSFER INDICATION

▷ Green : Normal transfer (auto).
▶ Green : Manual transfer.
▶ Amber : Abnormal transfer.
No display : No transfer.

Ident.: DSC-28-20-G-00020121.0001001 / 17 MAR 17

CENTER TO INNER TRANSFER INDICATION

Identical to the transfer from outer to inner.

Ident.: DSC-28-20-G-00020122.0001001 / 17 MAR 17

CENTER TANK PUMPS INDICATION

Identical to the standby pumps.

Ident.: DSC-28-20-G-00020123.0001001 / 17 MAR 17

TRIM TANK ISOLATION INDICATION

This valve represents the trim tank isolation valve and the trim tank inlet valve.

In line - Green : One valve is open.
Cross line - Green : Both valves are closed.
In line - Amber : One valve is abnormally open.
Cross line - Amber : Both valves are abnormally closed.

Ident.: DSC-28-20-G-00020124.0001001 / 17 MAR 17

TRIM TO CENTER TRANSFER INDICATION

No display : No transfer.
Green : Manual forward (↑) transfer.
Green : Normal aft (↓) or forward (↑) transfer (auto).
Amber : Abnormal aft (↓) or forward (↑) transfer.

Ident.: DSC-28-20-G-00020125.0003001 / 17 MAR 17

TRIM TO INNER TRANSFER INDICATION

No display : No transfer.
Green : Normal aft (↓) or forward (↑) transfer.
Amber : Abnormal aft (↓) or forward (↑) transfer.

If fuel transfers to/from only one inner tank due to a fuel imbalance, (inner tanks are imbalanced by more than 500 kg/1 100 lb) only one arrow is displayed in green.

Ident.: DSC-28-20-G-00020126.0001001 / 17 MAR 17

APU LP VALVE INDICATION

APU (White) ▿ (White) : Valve is closed.
APU (White) ▿ (Green) : Fuel provided to the APU.
APU (Amber) ▾ (Amber) : Failed open.
APU (amber) : Failed closed.

Ident.: DSC-28-20-G-00020127.0001001 / 17 MAR 17

JETTISON ◁ INDICATION

No display : No jettison.
↓ JETTISON (Green) : Jettison normally active.
↓ JETTISON (Amber) : Abnormal jettison (valve abnormally open).
JETTISON (Amber) : Valve abnormally closed.

Ident.: DSC-28-20-G-00020128.0001001 / 17 MAR 17

X-FEED VALVE

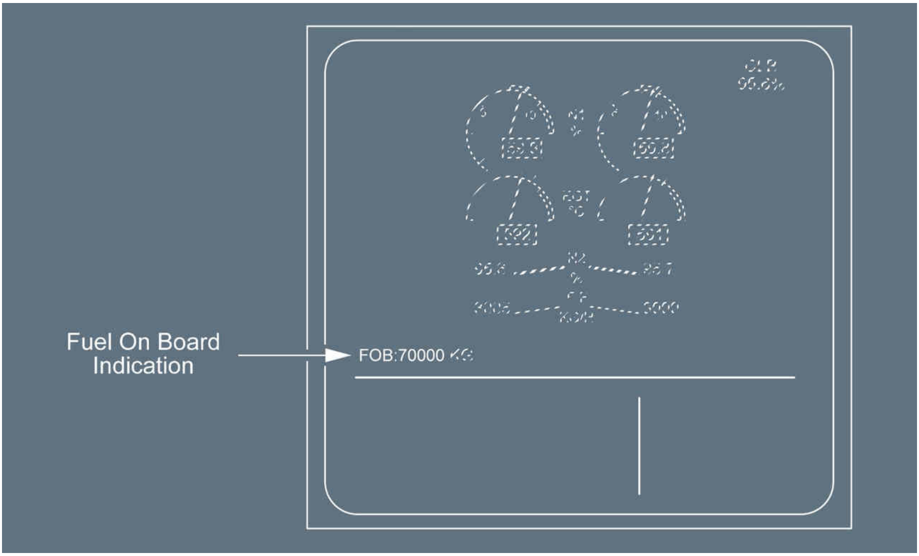
Cross line - Green : Valve is closed.
In line - Green : Valve is open.
Cross line - Amber : Valve is abnormally closed.

In line - Amber : Valve is abnormally open.
Transit - Amber : Valve is in transit.

ECAM UPPER DISPLAY

Applicable to: ALL

Ident.: DSC-28-20-E-00020035.0001001 / 17 MAR 17



Ident.: DSC-28-20-E-00020100.0001001 / 17 MAR 17

FOB - FUEL ON BOARD INDICATION

- It is normally green.
- An amber half box appears around FOB, when the indicated quantity is not fully usable.
- When the fuel quantity indication is inaccurate, two amber lines appear across the last two digits.
- Units may be indicated in kg or lbs.

MEMO DISPLAY

Ident.: DSC-28-20-B-00017172.0001001 / 21 MAR 16
Applicable to: ALL

FUEL X FEED : This memo appears in green when the crossfeed valve is open (automatically or manually). It becomes amber during takeoff (flight phases 3, 4 and 5).

Ident.: DSC-28-20-B-00017174.0002001 / 21 MAR 16
Applicable to: LV-KAN, LV-KAO

JETTISON : This memo appears in green when the jettison valve is open.

Ident.: DSC-28-20-B-00017171.0001001 / 21 MAR 16
Applicable to: ALL

OUTR TK XFR : This memo appears in green during fuel transfer from outer tank into the inner tank.

Ident.: DSC-28-20-B-00017167.0001001 / 21 MAR 16
Applicable to: ALL

OUTR TK XFRD : This memo appears in green when the outer tank has been emptied following a transfer into the inner tank.

Ident.: DSC-28-20-B-00017158.0001001 / 21 MAR 16
Applicable to: ALL

REFUEL IN PROCESS : This memo appears in green, in flight phases 1 and 10, if the refuel panel switches are not set in the appropriate position for flight.

Ident.: DSC-28-20-B-00017163.0002001 / 21 MAR 16
Applicable to: ALL

REFUEL PNL : This memo appears in amber in flight phase 2 (after engine start), if the refuel panel or the cockpit refuel pb ◁ are not set in the appropriate position for flight.

Ident.: DSC-28-20-B-00017165.0001001 / 21 MAR 16
Applicable to: ALL

T TK XFRD : This memo appears in green in flight phases 6, 7, 8 and 9 when the trim tank has been emptied following a forward transfer.

Ident.: DSC-28-20-B-00017166.0001001 / 21 MAR 16
Applicable to: ALL

TRIM TK XFR : This memo appears in green during trim tank transfer.

ERRONEOUS AFT XFR FAULT TRIGGERING DURING REFUELLING

Ident.: DSC-28-100-00025739.0001001 / 10 MAY 22
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

DESCRIPTION

The FUEL AFT XFR FAULT alert may spuriously trigger during the refuelling when the fuel pumps are ON.

OPERATIONAL RECOMMENDATION

At the end of the refuelling, when the refuel mode is selected OFF, the ECAM alert should clear by itself.
If the alert is still displayed, set all the fuel pumps to OFF then ON again to clear the ECAM alert.
If the alert does not clear, it has to be considered as a real alert and reported in the logbook.

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AIRCRAFT SYSTEMS

HYDRAULIC

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DSC-29-10 Description

DSC-29-10-10 General

General.....A

DSC-29-10-20 Generation

Green System Pumps.....A
Blue System Pumps.....B
Yellow System Pumps.....C
Ram Air Turbine (RAT).....D
System Accumulators.....E
Fire Shutoff Valves.....F
Filters.....G
Hydraulic System Monitoring Unit (HSMU).....H
Hydraulic Generation.....I
Reservoir Pressurization.....J
Indications.....K

DSC-29-10-30 Distribution

Distribution.....A
Leak Measurement Valves.....B
Priority Function.....C

DSC-29-20 Controls and Indicators

Overhead Panel.....A
Overhead Panel (Cont'd).....B
ECAM HYD Page.....C
Memo Display.....D

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GENERAL

Ident.: DSC-29-10-10-00000265.0001001 / 21 MAR 16
Applicable to: ALL

The aircraft has three, independent, continuously-operating hydraulic systems : GREEN, BLUE, and YELLOW. Each system is supplied from its own hydraulic reservoir. Normal system operating pressure is 3 000 PSI (2 500 PSI for RAT). There is no possibility to transfer hydraulic fluid from one system to another.
The system is monitored by a Hydraulic System Monitoring Unit (HSMU).

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GREEN SYSTEM PUMPS

Ident.: DSC-29-10-20-00000266.0003001 / 21 MAR 16
Applicable to: ALL

Two pumps, respectively driven by each engine pressurize the green system.
In addition, an electric pump which can be manually or automatically controlled can also pressurize the green system.
If one engine fails, the electric pump runs automatically in flight, for 25 s, when the landing gear lever is selected up (to ensure gear retraction in a proper time).
A pump, driven by a Ram Air Turbine (RAT), pressurizes the green system in the event of an emergency.
When the RAT pressurizes the green system, the aileron, elevator, and spoiler servo control operating speeds are reduced.

BLUE SYSTEM PUMPS

Ident.: DSC-29-10-20-00000272.0003001 / 21 MAR 16
Applicable to: ALL

A pump, driven by Engine 1, pressurizes the blue system.
A manually-controlled electric pump can also pressurize the system.
In the event of an Engine 1 failure, in addition to a PRIM 1 or PRIM 3 loss : The BLUE ELEC PUMP runs automatically in flight to ensure sufficient authority on the electrical rudder, thereby counteracting the yaw sideslip induced by asymetrical thrust.

YELLOW SYSTEM PUMPS

Ident.: DSC-29-10-20-00000277.0002001 / 21 MAR 16
Applicable to: ALL

A pump, driven by Engine 2 pressurizes the yellow system.
In addition, an electric pump which can be manually or automatically controlled can also pressurize the yellow system. This enables ground operations, when the engines are stopped.

The electric pump runs automatically :
- in flight, in the event of Engine 2 failure, if the FLAPS lever is not at 0 (to ensure flap retraction in a proper time at takeoff).
- on the ground during cargo door operation.

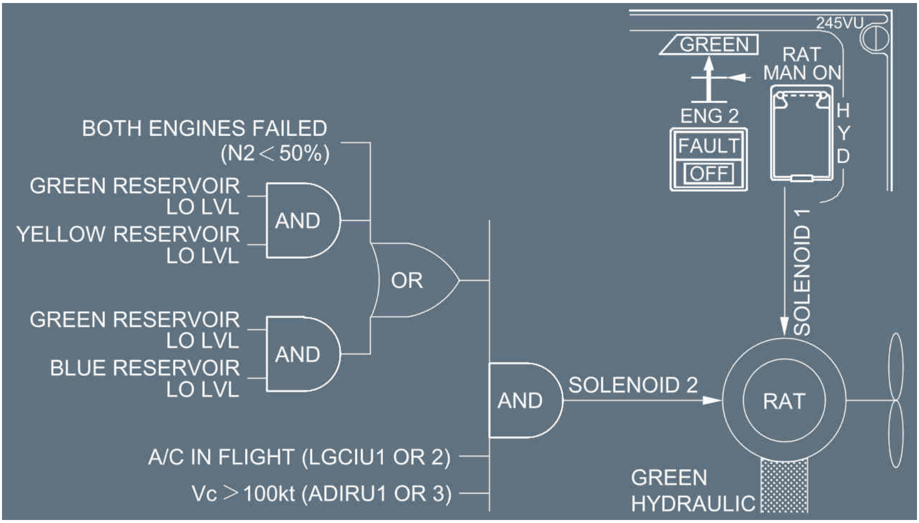
Crewmembers can also use a hand pump to pressurize the yellow system, in order to operate the cargo doors when no electrical power is available.

Note: *On each system, the electric pump flow is about 18 % of the engine-driven pump flow capacity. It can be used to retract the surfaces, but should not be used to replace the engine-driven pumps.*

RAM AIR TURBINE (RAT)

Ident.: DSC-29-10-20-00000285.0003001 / 23 SEP 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

A drop-out RAT, coupled to a hydraulic pump, allows the green system to function.
The RAT may be extended at any time by pressing the RAT MAN ON pushbutton.
The RAT deploys automatically in the event of both engine failure or a low level in the green and yellow or green and blue reservoirs. It can be manually deployed from the overhead panel. It can only be stowed when the aircraft is on the ground.


245VU
GREEN
RAT
MAN ON
ENG 2
FAULT
OFF
H
Y
D
BOTH ENGINES FAILED
(N2 < 50%)
GREEN RESERVOIR
LO LVL
YELLOW RESERVOIR
LO LVL
AND
OR
GREEN RESERVOIR
LO LVL
BLUE RESERVOIR
LO LVL
AND
SOLENOID 1
AND
SOLENOID 2
RAT
A/C IN FLIGHT (LGCIU1 OR 2)
Vc > 100kt (ADIRU1 OR 3)
GREEN
HYDRAULIC

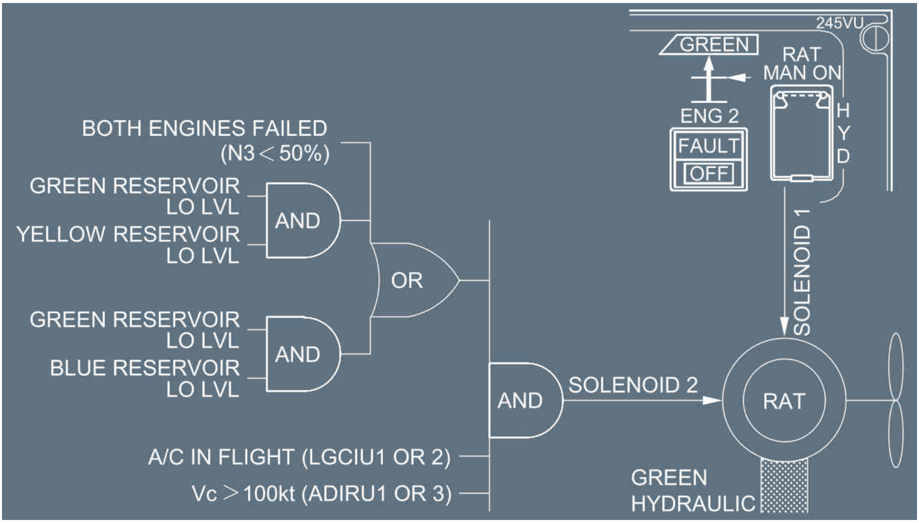
Note: *The RAT flow varies between 15 % and 45 % of an engine-driven pump flow capability, depending on the aircraft's speed.*

RAM AIR TURBINE (RAT)

Ident.: DSC-29-10-20-00000285.0004001 / 23 SEP 15
Applicable to: LV-KHT, LV-KHU

A drop-out RAT, coupled to a hydraulic pump, allows the green system to function.
The RAT may be extended at any time by pressing the RAT MAN ON pushbutton.

The RAT deploys automatically in the event of both engine failure or a low level in the green and yellow or green and blue reservoirs. It can be manually deployed from the overhead panel. It can only be stowed when the aircraft is on the ground.


245VU
GREEN
RAT MAN ON
ENG 2
FAULT
OFF
H
Y
D
BOTH ENGINES FAILED (N3 < 50%)
GREEN RESERVOIR LO LVL
YELLOW RESERVOIR LO LVL
AND
OR
GREEN RESERVOIR LO LVL
BLUE RESERVOIR LO LVL
AND
SOLENOID 1
AND
SOLENOID 2
RAT
A/C IN FLIGHT (LGCIU1 OR 2)
Vc > 100kt (ADIRU1 OR 3)
GREEN HYDRAULIC

Note: *The RAT flow varies between 15 % and 45 % of an engine-driven pump flow capability, depending on the aircraft's speed.*

SYSTEM ACCUMULATORS

Ident.: DSC-29-10-20-00000288.0001001 / 21 MAR 16
Applicable to: ALL

An accumulator in each system helps maintain constant pressure by covering transient demands during normal operation.

FIRE SHUTOFF VALVES

Ident.: DSC-29-10-20-00000293.0005001 / 21 MAR 16
Applicable to: ALL

A fire shutoff valve is positioned upstream of each engine driven pump. The flight crew can close the valve by pushing the FIRE pushbutton.
Both engine green hydraulic fire shut-off valves are automatically closed by the HSMU, in the event of a green reservoir low level. If the blue and yellow reservoir levels are normal, 150 s after the initial closure of the fire shut-off valves, the green engine-driven pumps are automatically depressurized and the fire shut-off valves are reopened to lubricate and avoid damage to the engine-driven pumps.

In case of a further blue or yellow reservoir low level, the green fire shut-off valves remain closed, enabling the green system to be restored by using the RAT. The flight crew cannot re-open the fire shut-off valves in flight, once they have been automatically closed.

FILTERS

Ident.: DSC-29-10-20-00000295.0002001 / 21 MAR 16
Applicable to: ALL

L3 The hydraulic fluid is maintained clean by filters:
- Two HP filters on green system
- One HP filter on blue system and one on yellow system
- One on the reservoir filling system
- One on the braking system
- One return line filter on each system (LP filters)
- One case drain filter on engine pump permits the monitoring of wear by detection of metallic particles in the filters.

HYDRAULIC SYSTEM MONITORING UNIT (HSMU)

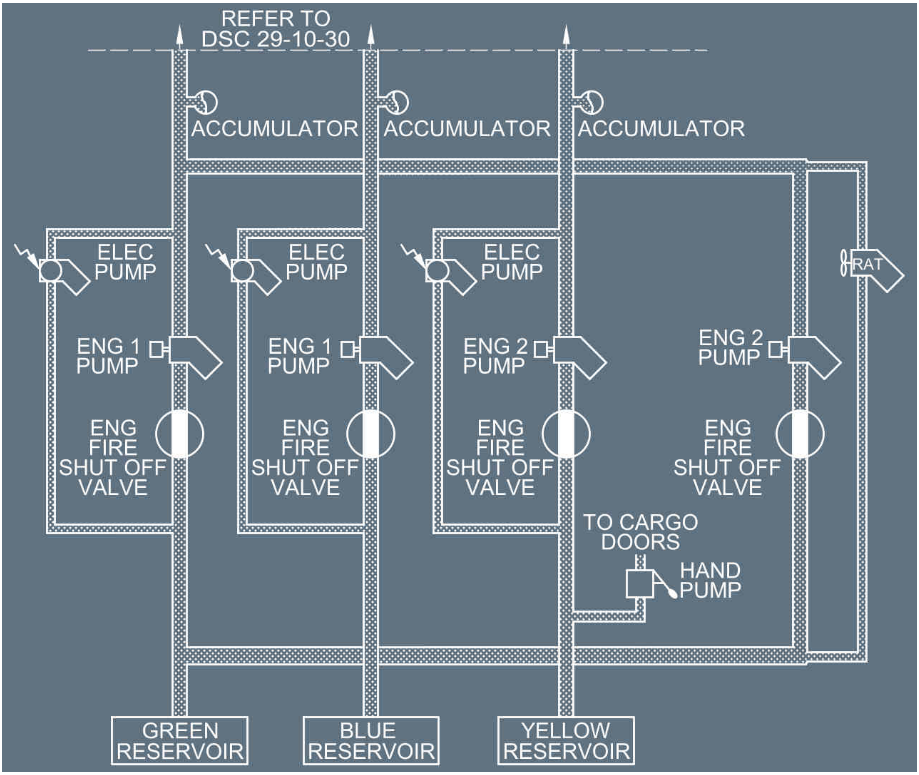
Ident.: DSC-29-10-20-00000296.0002001 / 21 MAR 16
Applicable to: ALL

The HSMU monitors the hydraulic system.

It processes :
- Control of electric pumps
- RAT extension
- Both engine green hydraulic fire shutoff valve closure in case of green reservoir low level
- Hydraulic quantity indication correction for fluid temperature
- Reservoir overheat warning
- FAULT light illumination logic
- LEAK MEASUREMENT VALVE control (closure inhibited in flight, closure of yellow valve during cargo door operation).

HYDRAULIC GENERATION

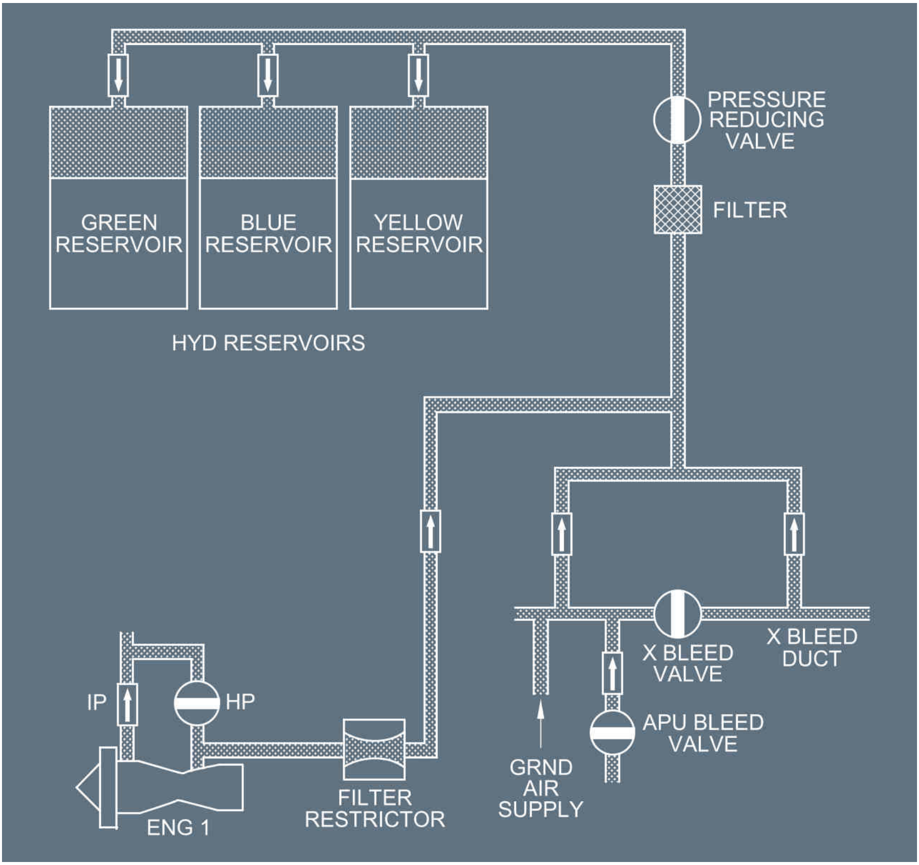
Ident.: DSC-29-10-20-00000298.0002001 / 04 MAR 13
Applicable to: ALL


REFER TO
DSC 29-10-30
ACCUMULATOR
ACCUMULATOR
ACCUMULATOR
ELEC PUMP
ELEC PUMP
ELEC PUMP
RAT
ENG 1 PUMP
ENG 1 PUMP
ENG 2 PUMP
ENG 2 PUMP
ENG FIRE SHUT OFF VALVE
ENG FIRE SHUT OFF VALVE
ENG FIRE SHUT OFF VALVE
ENG FIRE SHUT OFF VALVE
TO CARGO DOORS
HAND PUMP
GREEN RESERVOIR
BLUE RESERVOIR
YELLOW RESERVOIR

RESERVOIR PRESSURIZATION

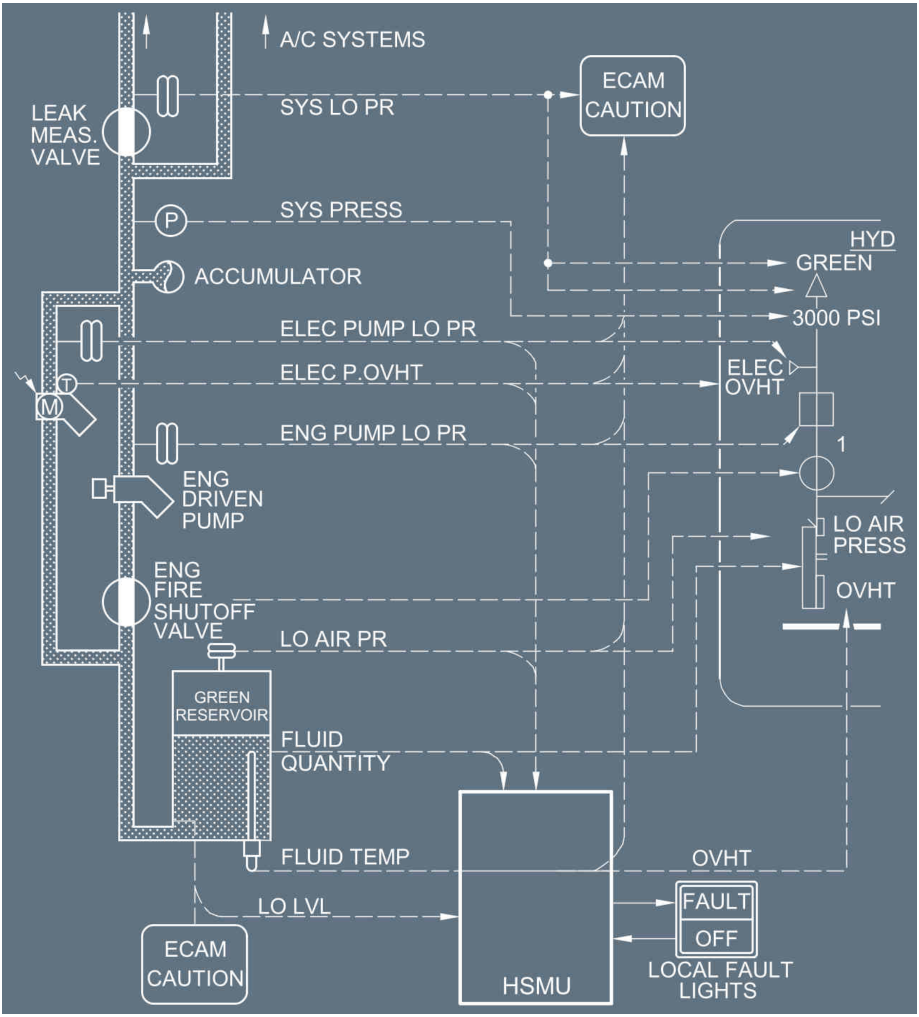
Ident.: DSC-29-10-20-00000300.0002001 / 04 MAR 13
Applicable to: ALL

Normally, HP bleed air from engine 1 pressurizes the hydraulic reservoirs automatically. If the bleed air pressure is too low, the system takes bleed air pressure from the crossbleed duct.
The system maintains a high enough pressure to prevent their pumps from cavitating.


PRESSURE REDUCING VALVE
FILTER
GREEN RESERVOIR
BLUE RESERVOIR
YELLOW RESERVOIR
HYD RESERVOIRS
X BLEED DUCT
X BLEED VALVE
IP
HP
APU BLEED VALVE
GRND AIR SUPPLY
FILTER RESTRICTOR
ENG 1

INDICATIONS

Ident.: DSC-29-10-20-00000301.0001001 / 04 MAR 13
Applicable to: ALL


A/C SYSTEMS
ECAM
CAUTION
LEAK
MEAS.
VALVE
SYS LO PR
SYS PRESS
P
ACCUMULATOR
HYD
GREEN
3000 PSI
ELEC PUMP LO PR
ELEC P.OVHT
ELEC
OVHT
T
M
ENG PUMP LO PR
1
ENG
DRIVEN
PUMP
LO AIR
PRESS
OVHT
ENG
FIRE
SHUTOFF
VALVE
LO AIR PR
GREEN
RESERVOIR
FLUID
QUANTITY
FLUID TEMP
OVHT
LO LVL
FAULT
OFF
LOCAL FAULT
LIGHTS
ECAM
CAUTION
HSMU

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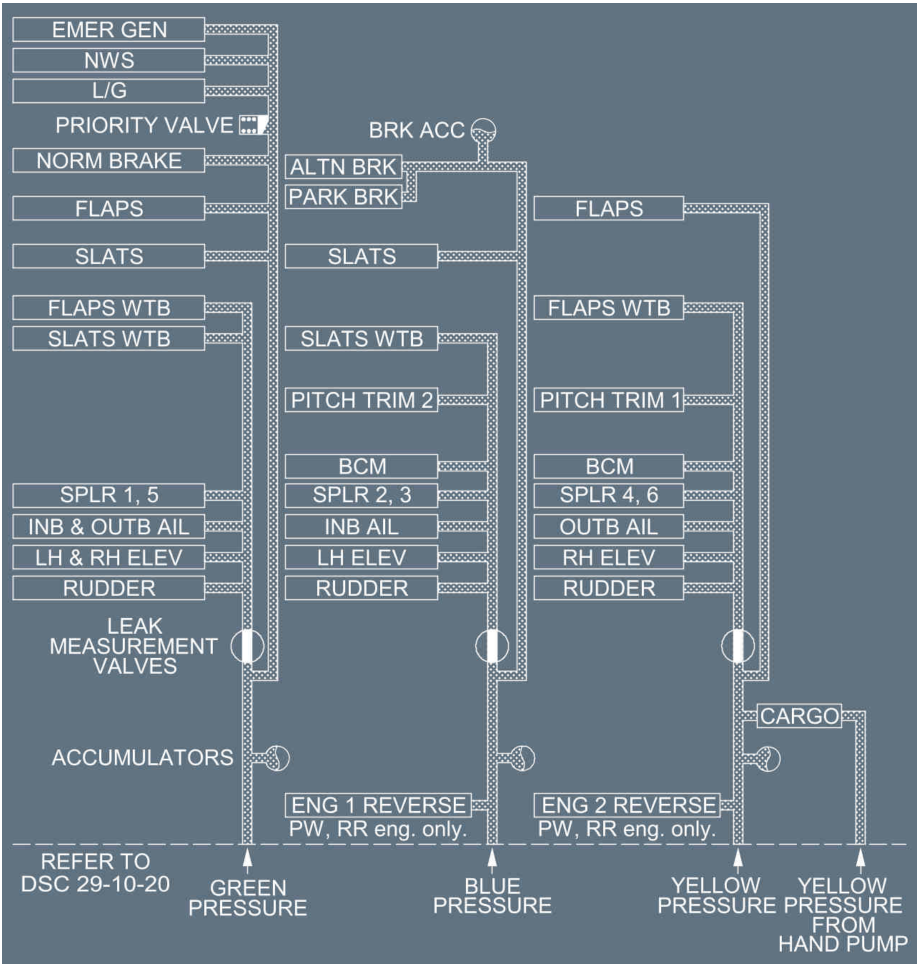
DISTRIBUTION

Ident.: DSC-29-10-30-00000303.0006001 / 04 MAR 13
Applicable to: ALL


EMER GEN
NWS
L/G
PRIORITY VALVE
NORM BRAKE
FLAPS
SLATS
FLAPS WTB
SLATS WTB
SPLR 1, 5
INB & OUTB AIL
LH & RH ELEV
RUDDER
LEAK MEASUREMENT VALVES
ACCUMULATORS
REFER TO DSC 29-10-20
GREEN PRESSURE
BRK ACC
ALTN BRK
PARK BRK
SLATS
SLATS WTB
PITCH TRIM 2
BCM
SPLR 2, 3
INB AIL
LH ELEV
RUDDER
ENG 1 REVERSE
PW, RR eng. only.
BLUE PRESSURE
FLAPS
FLAPS WTB
PITCH TRIM 1
BCM
SPLR 4, 6
OUTB AIL
RH ELEV
RUDDER
CARGO
ENG 2 REVERSE
PW, RR eng. only.
YELLOW PRESSURE
YELLOW PRESSURE FROM HAND PUMP

LEAK MEASUREMENT VALVES

Ident.: DSC-29-10-30-00000306.0001001 / 21 MAR 16
Applicable to: ALL

Used only on ground.
Leak measurement valves are positioned upstream of the primary flight controls. They are used for the leak measurement of each system and may only be closed on ground, by using the LEAK MEASUREMENT VALVES pushbutton on the maintenance panel. The yellow valve is automatically closed during cargo door operation.
The HSMU inhibits the closure of the green, blue and yellow hydraulic leak measurement valves in flight.

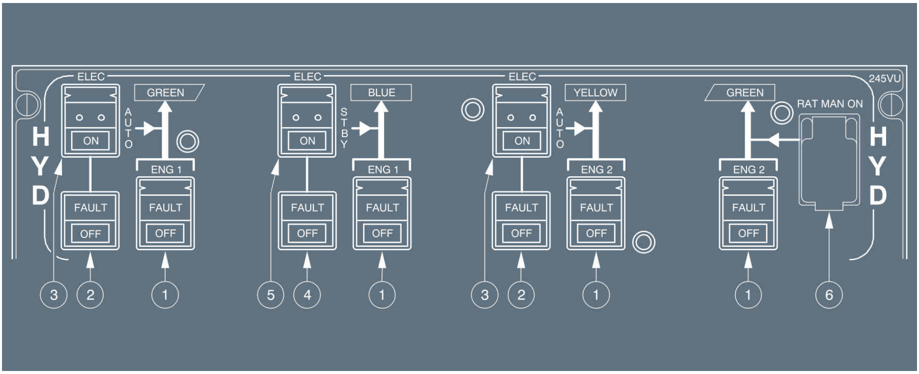
PRIORITY FUNCTION

Ident.: DSC-29-10-30-00000308.0001001 / 22 MAR 16
Applicable to: ALL

In the event of low hydraulic pressure, a priority valve cuts off hydraulic power to heavy load users (emergency generator, nosewheel steering, landing gear) in order to keep the pressure for normal braking and flight controls.
A Pressure-Off Brake system (installed on the flaps, slats, and THS actuator) ensures the same function.

OVERHEAD PANEL

Ident.: DSC-29-20-00000318.0008001 / 29 MAR 12
Applicable to: ALL


ELEC
GREEN
ON
AUTO
ENG 1
FAULT
OFF
ELEC
BLUE
ON
STBY
ENG 1
FAULT
OFF
ELEC
YELLOW
ON
AUTO
ENG 2
FAULT
OFF
GREEN
RAT MAN ON
245VU
ENG 2
FAULT
OFF
HYD
HYD
3
2
1
5
4
1
3
2
1
1
6

(1) ENG 1 (or 2) PUMP pb sw (guarded)

On	:	The pump pressurizes the system, when the engine is running.
OFF	:	The pump is depressurized. Hydraulic power generation stops.
FAULT light	:	This amber light and an associated ECAM caution come on, if: - The reservoir level is low - The reservoir overheats - Reservoir air pressure in the reservoir is low - The pump pressure is low (inhibited on ground, when the engine is stopped). This light goes off, when the crew selects OFF, except during an overheat. (The light stays on, for as long as the overheat lasts).

(2) GREEN (or YELLOW) ELEC PUMP pb

AUTO : The HSMU automatically controls the pump:
- The green electric pump runs:
  - For 25 s, in the event of a one-engine failure, when the landing selector lever is selected up and the aircraft speed is above 100 kt.
- The yellow electric pump runs:
  - In the event of an Engine 2 failure, if the FLAPS lever is not at zero and the aircraft speed is above 100 kt, provided the green electric pump is not running for landing gear retraction. It remains running until the last engine shutdown.
  - On ground, when the lever of the cargo door manual selector valve is set to the OPEN or CLOSE position. In this case, the yellow leak measurement valve closes, and yellow flap motor operation is inhibited.

OFF : The pump is off.

FAULT light : This amber light, and an associated ECAM caution come on, if:
- The reservoir level is low, or
- The reservoir overheats, or
- Air pressure in the reservoir is low, or
- The pump delivers low pressure (inhibited when the pump is not controlled on), or
- The pump overheats.

The light goes off when the crew selects OFF, except during an overheat. In the case of a reservoir or an electrical pump overheat, the fault light stays on, until the overheat stops.

Note: *If the yellow/green electric pump overheats, the pump automatically shuts down.*

(3) GREEN (or YELLOW) ELEC PUMP ON pb (springloaded-guarded)

AUTO : The electric pump is controlled by the applicable ELEC PUMP pb's.

ON : The electric pump is on, provided the ELEC PUMP pb's is not selected OFF. After an electrical power interruption, the pump does not restart (ON light stays off).
The ON light comes on blue, when the pump is manually or automatically supplied.

(4) BLUE ELEC PUMP pb

Standby : The HSMU automatically controls the electric pump, in the event of an engine 1 failure in addition to a PRIM 1 or 3 loss.

OFF : The pump is off.

FAULT light : The amber fault light comes on (provided the blue electrical pump is running), along with an associated ECAM caution, if:
- The reservoir level is low, or
- Air pressure in the reservoir or pump pressure is low, or
- The reservoir or the pump overheat.

The light goes off when the crew selects OFF, except during an overheat. In the case of a reservoir or an electrical pump overheat, the fault light stays on, until the overheat stops.

Note: If the blue electric pump overheats, the pump automatically shuts down.

(5) BLUE ELEC PUMP ON pb (springloaded-guarded)

ON : The electric pump is on, provided the ELEC PUMP pb is not selected OFF. If the electrical power supply is removed, the pump remains off when electrical power is applied again.

STBY : The electric pump is controlled by the applicable ELEC PUMP pb’s.

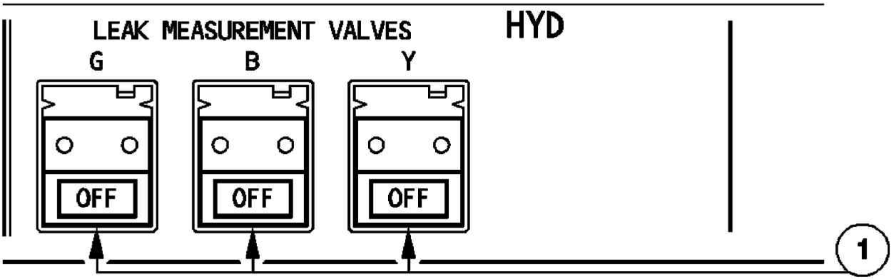
(6) RAT MAN ON pb

The RAT may be extended at any time by pressing the RAT MAN ON pb.

Note: The RAT automatically extends in flight, if:
Both engines fail, or GREEN + BLUE LO LVL, or GREEN + YELLOW LO LVL.

OVERHEAD PANEL (CONT'D)

Ident.: DSC-29-20-00000333.0002001 / 21 MAR 16
Applicable to: ALL



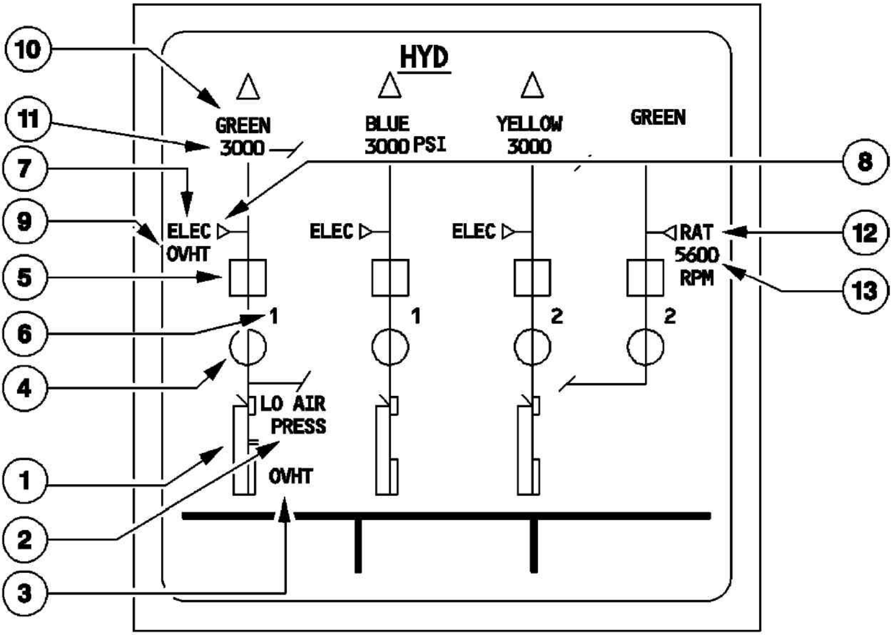
(1) LEAK MEASUREMENT VALVES pushbutton (guarded) (to be used on ground only)

OFF : The corresponding electrohydraulic valve closes, and shuts off hydraulic supply to the primary flight controls. This function is inhibited, when the aircraft speed is greater than 100 kt.

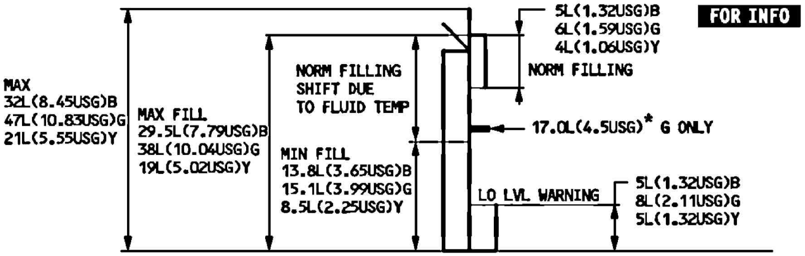
Note: 1. *Even if the function is inhibited in flight : If the flight crew inadvertently presses this pushbutton, the OFF light will still come on to advise the crew that the electrohydraulic valves will close at landing, when the aircraft speed is less than 100 kt.*
2. *On ground, the yellow valve automatically closes, when the cargo door is activated (to avoid inadvertent movement of the flight control surfaces).*
The OFF light comes on.

ECAM HYD PAGE

Ident.: DSC-29-20-00000337.0007001 / 16 FEB 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


HYD
GREEN
3000
BLUE
3000 PSI
YELLOW
3000
GREEN
ELEC
OVHT
ELEC
ELEC
RAT
5600
RPM
1
1
2
2
LO AIR
PRESS
OVHT
10
11
7
9
5
6
4
1
2
3
8
12
13

(1) Reservoir quantity
This indication is in green, unless the fluid level goes below the warning level, in which case it becomes amber.


FOR INFO
MAX
32L(8.45USG)B
47L(10.83USG)G
21L(5.55USG)Y
MAX FILL
29.5L(7.79USG)B
38L(10.04USG)G
19L(5.02USG)Y
NORM FILLING
SHIFT DUE
TO FLUID TEMP
MIN FILL
13.8L(3.65USG)B
15.1L(3.99USG)G
8.5L(2.25USG)Y
5L(1.32USG)B
6L(1.59USG)G
4L(1.06USG)Y
NORM FILLING
17.0L(4.5USG)* G ONLY
LO LVL WARNING
5L(1.32USG)B
8L(2.11USG)G
5L(1.32USG)Y

* A SINGLE WHITE BAR IS DISPLAYED WHEN ACTUAL FLUID LEVEL IS ABOVE 17L (4.5USG) AND IS REPLACED BY TWO AMBER BARS WHEN BELOW 17L.

Note: *The nominal filling range indication is corrected for fluid temperature effect. It is normally green. When temperature information is unavailable, it is no longer corrected and the indication becomes white.*

(2) Reservoir LO AIR PRESS indication
It is amber, and an associated caution appears on the ECAM, if the air pressure for the indicated reservoir drops below normal.

(3) Reservoir OVHT indication
It is amber, and an associated caution appears on the ECAM, if the temperature of the returning hydraulic fluid, at the inlet to its reservoir, is above normal.

(4) FIRE SHUTOFF VALVE indication

Crossline - Amber	:	The valve is fully closed.
In line - Green	:	The valve is partially closed.

(5) ENG PUMPS control and low pressure indication

In line - Green	:	The designated PUMP's pushbutton is on, and hydraulic pressure is normal.
Crossline - Amber	:	The designated PUMP's pushbutton is off.
"LO" - Amber	:	The designated PUMP's pushbutton is on, and hydraulic pressure is low.

(6) PUMP identification
It is white, and becomes amber when the corresponding engine’s N2 is below idle.

(7) ELEC indication

It is normally white. It becomes amber, if the associated power supply fails, or if the pump is commanded on and does not provide normal pressure.

(8) ELEC PUMP control

▷ White : The electric pump is not commanded.
▷ Amber : The electric pump is off.
▶ Green : The electric pump is on.
▶ Amber : The electric pump is on and the system has low pressure.

(9) Electric pumps OVHT indication

It is amber, if the electric pump for that system overheats. This indication remains displayed on the ECAM, during the electrical pump overheat.

(10) System label (SYS LO PR sw)

	PRESS > 1 750 PSI (PRESS increasing)	**PRESS < 1 450 PSI (PRESS decreasing)**
GREEN	white	amber
△	green	amber

(11) System pressure

This legend, normally green, becomes amber when system pressure is below 1 450 PSI

(12) RAT control

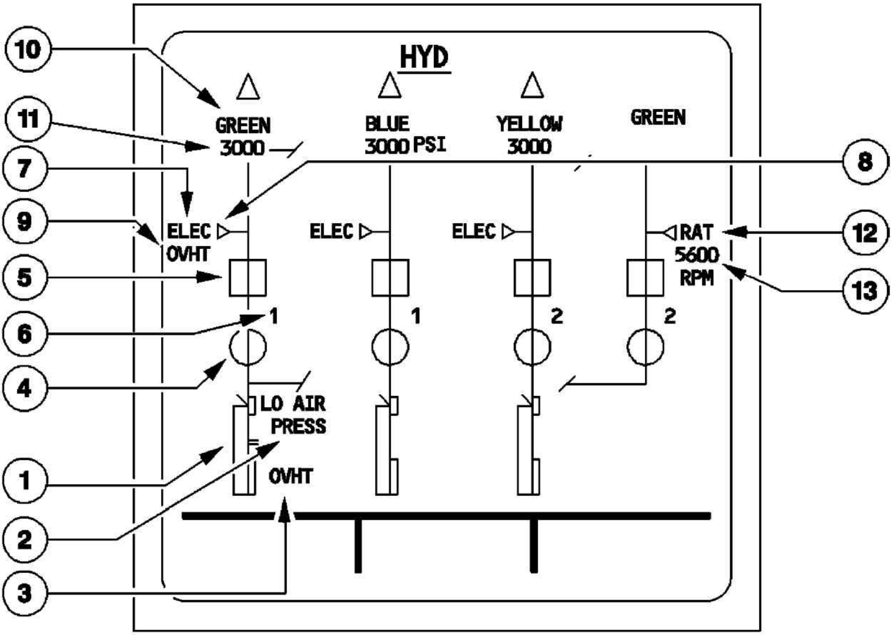
◁	**RAT**	**MEANING**
White	white	RAT stowed
Full green	white	RAT not stowed and RPM > 3 000
White	amber	RAT fully stowed and stowing pressure applied
Full amber	amber	RAT not stowed and RPM < 3 000

(13) RPM indication

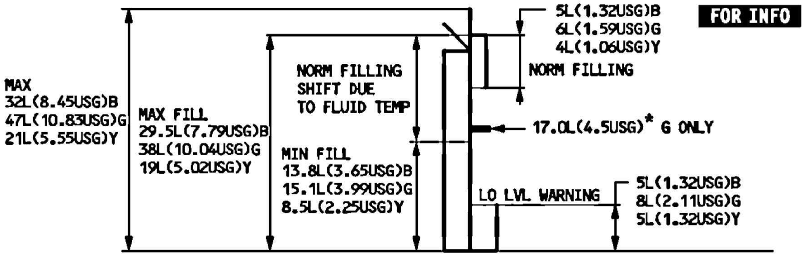
This appears green when the rotation speed of the RAT is above 100 rpm.

ECAM HYD PAGE

Ident.: DSC-29-20-00000337.0008001 / 16 FEB 11
Applicable to: LV-KHT, LV-KHU


HYD
GREEN
3000
BLUE
3000 PSI
YELLOW
3000
GREEN
ELEC
OVHT
ELEC
ELEC
RAT
5600
RPM
1
1
2
2
LO AIR
PRESS
OVHT
10
11
7
9
5
6
4
1
2
3
8
12
13

(1) Reservoir quantity
This indication is in green, unless the fluid level goes below the warning level, in which case it becomes amber.


FOR INFO
MAX
32L(8.45USG)B
47L(10.83USG)G
21L(5.55USG)Y
MAX FILL
29.5L(7.79USG)B
38L(10.04USG)G
19L(5.02USG)Y
NORM FILLING
SHIFT DUE
TO FLUID TEMP
MIN FILL
13.8L(3.65USG)B
15.1L(3.99USG)G
8.5L(2.25USG)Y
5L(1.32USG)B
6L(1.59USG)G
4L(1.06USG)Y
NORM FILLING
17.0L(4.5USG)* G ONLY
LO LVL WARNING
5L(1.32USG)B
8L(2.11USG)G
5L(1.32USG)Y

* A SINGLE WHITE BAR IS DISPLAYED WHEN ACTUAL FLUID LEVEL IS ABOVE 17L (4.5USG) AND IS REPLACED BY TWO AMBER BARS WHEN BELOW 17L.

Note: The nominal filling range indication is corrected for fluid temperature effect. It is normally green. When temperature information is unavailable, it is no longer corrected and the indication becomes white.

(2) Reservoir LO AIR PRESS indication

It is amber, and an associated caution appears on the ECAM, if the air pressure for the indicated reservoir drops below normal.

(3) Reservoir OVHT indication

It is amber, and an associated caution appears on the ECAM, if the temperature of the returning hydraulic fluid, at the inlet to its reservoir, is above normal.

(4) FIRE SHUTOFF VALVE indication

Crossline - Amber : The valve is fully closed.

In line - Green : The valve is partially closed.

(5) ENG PUMPS control and low pressure indication

In line - Green : The designated PUMP's pushbutton is on, and hydraulic pressure is normal.

Crossline - Amber : The designated PUMP's pushbutton is off.

"LO" - Amber : The designated PUMP's pushbutton is on, and hydraulic pressure is low.

(6) PUMP identification

It is white, and becomes amber when the corresponding engine's N3 is below idle.

(7) ELEC indication

It is normally white. It becomes amber if the associated power supply fails, or if the pump is commanded on and does not provide normal pressure.

(8) ELEC PUMP control

▷ White : The electric pump is not commanded.
▷ Amber : The electric pump is off.
▷— Green : The electric pump is on.
▷— Amber : The electric pump is on and the system has low pressure.

(9) Electric pumps OVHT indication

It is amber, if the electric pump for that system overheats. This indication remains displayed on the ECAM, during the electrical pump overheat.

(10) System label (SYS LO PR sw)

	PRESS > 1 750 PSI (PRESS increasing)	**PRESS < 1 450 PSI (PRESS decreasing)**
GREEN	white	amber
△	green	amber

(11) System pressure

This legend, normally green, becomes amber when system pressure is below 1 450 PSI

(12) RAT control

◁	**RAT**	**MEANING**
White	white	RAT stowed
Full green	white	RAT not stowed and RPM > 3 000
White	amber	RAT fully stowed and stowing pressure applied
Full amber	amber	RAT not stowed and RPM < 3 000

(13) RPM indication

This appears green when the rotation speed of the RAT is above 100 rpm.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-29-20-A-00017043.0001001 / 21 MAR 16

HYD ELEC PUMP : This memo appears in green when one of the three electric pumps is running (manually or automatic).

Ident.: DSC-29-20-A-00017042.0001001 / 21 MAR 16

RAT OUT : This memo appears in green, if the Ram Air Turbine is not fully stowed. The color changes to amber during flight phases 1 and 2.

AIRCRAFT SYSTEMS

ICE AND RAIN PROTECTION

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DSC-30-10 General

DSC-30-10-10 Description

General....A
Anti-Ice....B
Rain Removal....C

DSC-30-20 Wing Anti-Ice

DSC-30-20-10 Description

Description....A

DSC-30-20-20 Controls and Indicators

Overhead Panel....A
Ecam Bleed Page....B
Memo Display....C

DSC-30-30 Engine Anti-Ice

DSC-30-30-10 Description

Description....A

DSC-30-30-20 Controls and Indicators

Overhead Panel....A
Memo Display....B

DSC-30-40 Window Heat

DSC-30-40-10 Description

Description....A

DSC-30-40-20 Controls and Indicators

Overhead Panel....A

DSC-30-50 Probes Heat

DSC-30-50-10 Description

Description....A

DSC-30-50-20 Controls and Indicators

Overhead Panel....A

DSC-30-55 Water/Waste Anti-Ice

DSC-30-55-10 Description

Description....A

Continued on the following page

Continued from the previous page

DSC-30-55-20 System Operation

System Operation ..... A

DSC-30-60 Rain Removal

DSC-30-60-10 Description

Wipers ..... A
Rain Repellent System ◁ ..... B

DSC-30-60-20 Controls and Indicators

Overhead Panel ..... A
Rain Repellent System Indicators ◁ ..... B

DSC-30-70 Ice Detection System

DSC-30-70-10 Description

Visual Ice Indicator ..... A
Ice Detection System ..... B

GENERAL

Ident.: DSC-30-10-10-00000368.0001001 / 21 MAR 16
Applicable to: ALL

The ice and rain protection system allows unrestricted operation of the aircraft in icing conditions and heavy rain.

ANTI-ICE

Ident.: DSC-30-10-10-00000372.0003001 / 30 MAR 12
Applicable to: ALL

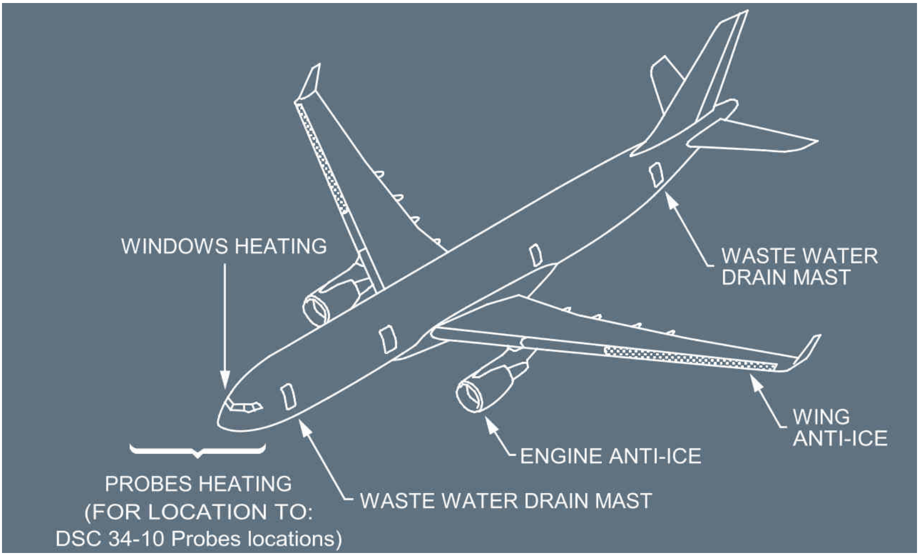
Either hot air or electrical heating protects critical areas of the aircraft as follows:

HOT AIR

- Four outboard leading-edge slats of each wing
- Engine air intakes.

ELECTRICAL HEATING

- Flight compartment windows
- Sensors, pitot probes, static ports, TAT probes and angle-of-attack probes
- Waste water drain mast.


WINDOWS HEATING
WASTE WATER DRAIN MAST
WING ANTI-ICE
ENGINE ANTI-ICE
WASTE WATER DRAIN MAST
PROBES HEATING
(FOR LOCATION TO:
DSC 34-10 Probes locations)

RAIN REMOVAL

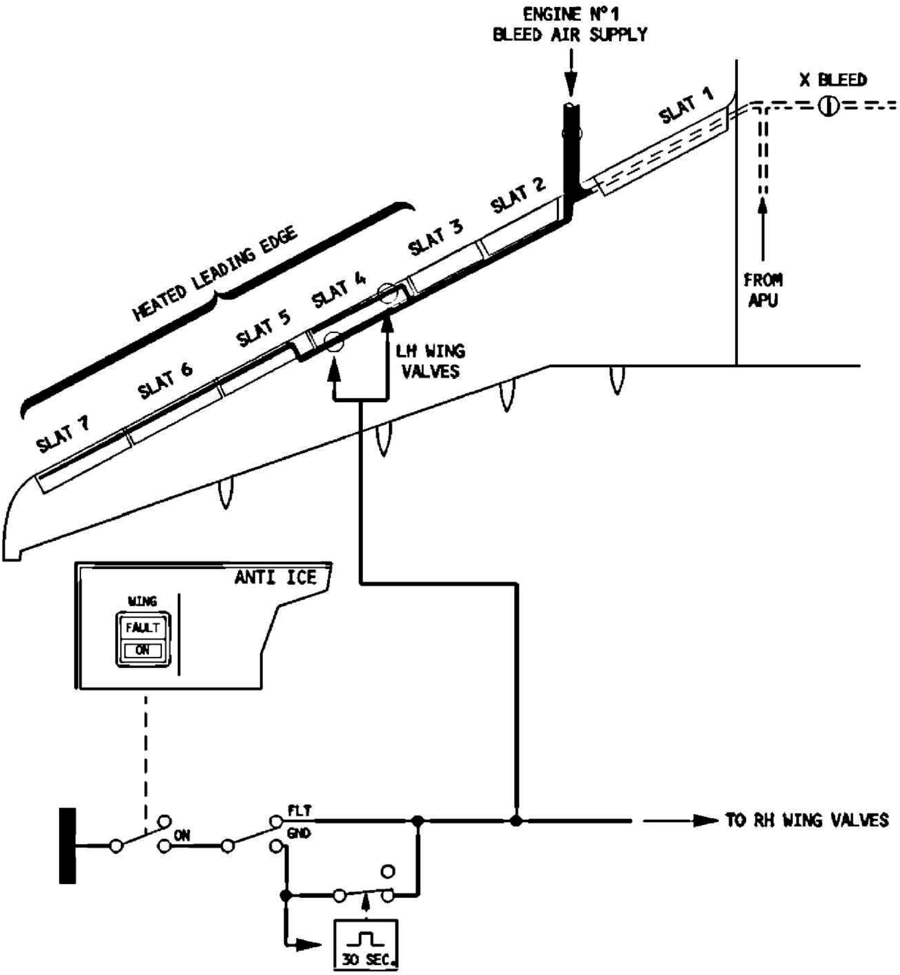
Ident.: DSC-30-10-10-00017819.0001001 / 21 MAR 16
Applicable to: ALL

Wipers and fluid rain repellent ◁ , remove rain from the front windshield panels.

DESCRIPTION

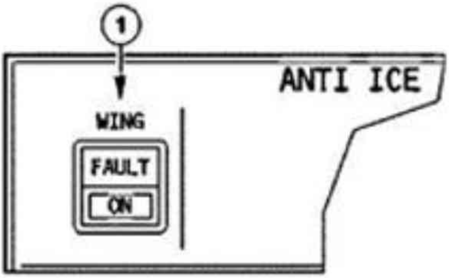
Ident.: DSC-30-20-10-00017822.0005001 / 21 MAR 16
Applicable to: ALL

Hot air from the pneumatic system heats the four outboard slats (4-5-6-7) of each wing in flight.
The WING pushbutton on the ANTI ICE panel controls the four valves.
When the aircraft is on ground, the flight crew can initiate a 30 s test sequence by turning the system ON.
If the system detects a leak during normal operation, the affected side's wing anti-ice valve automatically closes (*Refer to DSC-36-10-60 Leak Detection*).
When wing anti-ice is selected, the N1 or EPR limit is automatically reduced, and the idle N1 or EPR is automatically increased.
In the event of electrical power supply failure, the valves close.


ENGINE N°1
BLEED AIR SUPPLY
X BLEED
SLAT 1
SLAT 2
SLAT 3
SLAT 4
SLAT 5
SLAT 6
SLAT 7
HEATED LEADING EDGE
FROM
APU
LH WING
VALVES
ANTI ICE
WING
FAULT
ON
ON
FLT
GND
TO RH WING VALVES
30 SEC.

OVERHEAD PANEL

Ident.: DSC-30-20-20-00017826.0001001 / 21 MAR 16
Applicable to: ALL



(1) WING ANTI ICE pushbutton

This pushbutton simultaneously controls the wing anti-ice system on the left and right sides.

Off : The ON light goes off.
The wing anti-ice control valves close.

FAULT lt : Light comes on amber, and a caution appears on the ECAM, if :
- The position of the anti-ice control valve is not the required position, or
- Low pressure is detected.

Note: *The amber FAULT light comes on briefly during pressure built up, or when the valves open.*

ON : Light comes on blue.
The WING A.ICE indication appears on the ECAM MEMO page.
Wing anti-ice control valves open, if pneumatic supply is available.
On the ground, the wing anti-ice control valves open for only 30 s (test sequence).

ECAM BLEED PAGE

Ident.: DSC-30-20-20-00000414.0001001 / 21 MAR 16
Applicable to: ALL

(*Refer to DSC-36-20 BLEED SD Page*).

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-30-20-20-A-00017118.0003001 / 21 MAR 16

ICE NOT DET : This memo appears in green if ice is not detected for 130 s after the flight crew has set the WING ANTI ICE pb-sw to ON.

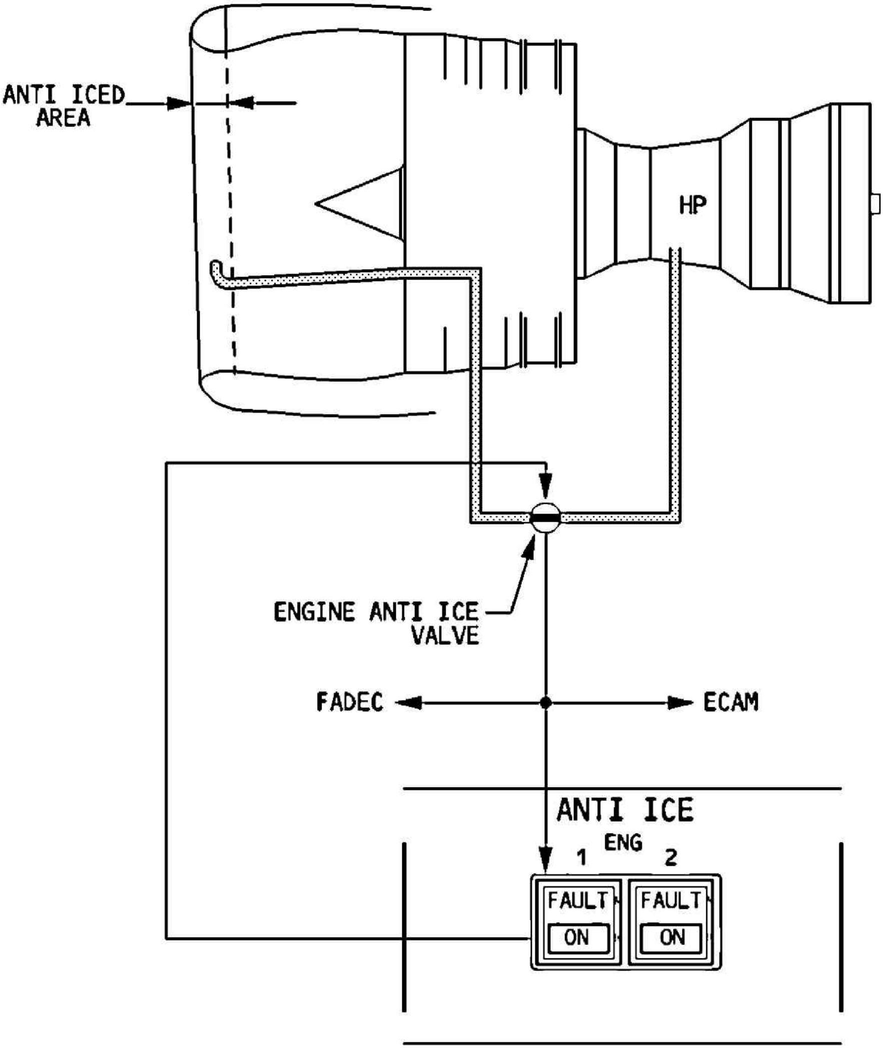
Ident.: DSC-30-20-20-A-00017117.0001001 / 21 MAR 16

WING A.ICE : This memo appears in green if the WING ANTI ICE pb-sw is ON.

DESCRIPTION

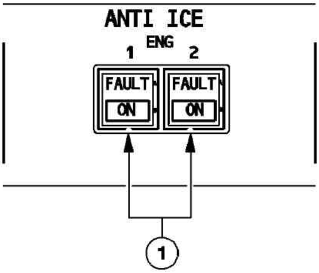
Ident.: DSC-30-30-10-00017827.0001001 / 21 MAR 16
Applicable to: ALL

An independent air bleed from the high pressure compressor protects each engine nacelle from ice.
The air is supplied through a two-position (open and closed) valve that the flight crew controls with pushbuttons : One for each engine.
The valve closes automatically if air is not available (engine not running).
When an engine anti-ice valve is open, the N1 or EPR limit for that engine is automatically reduced, and the idle N1 or EPR is automatically increased.
If electric power fails, the valves open.


ANTI ICED AREA
HP
ENGINE ANTI ICE VALVE
FADEC
ECAM
ANTI ICE
ENG
1
2
FAULT
ON
FAULT
ON

OVERHEAD PANEL

Ident.: DSC-30-30-20-00017829.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU



(1) ENG 1 (2) pb sw

OFF : ON light goes off.
The engine anti-ice valve closes.

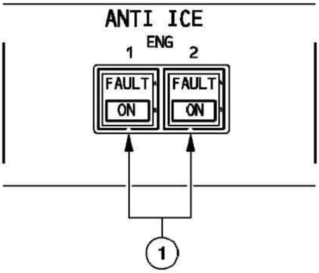
FAULT lt : Light comes on amber, with an ECAM caution, if the position of the anti-ice valve disagrees with the ENG pb sw selection.

Note: The amber FAULT light comes on briefly, while the valve transits.

ON : Light comes on blue.
The ENG A.ICE message appears on the ECAM MEMO display.
The engine anti-ice valve opens.
Continuous ignition is automatically activated if EIU is inoperative.

OVERHEAD PANEL

Ident.: DSC-30-30-20-00017829.0005001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO



(1) ENG 1 (2) pb sw

OFF : ON light goes off.
The engine anti-ice valve closes.

FAULT lt : Light comes on amber, with an ECAM caution, if the position of the anti-ice valve disagrees with the ENG pb sw selection.

ON : Light comes on blue.
The ENG A.ICE message appears on the ECAM MEMO display.
The engine anti-ice valve opens.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-30-30-20-A-00017119.0002001 / 21 MAR 16

ENG A.ICE : This memo appears in green if one ENG ANTI ICE pb-sw is ON, or if the nacelle anti-ice valve's electrical power is lost.

Ident.: DSC-30-30-20-A-00017120.0002001 / 21 MAR 16

ICE NOT DET : This memo appears in green if ice is not detected for 130 s after the flight crew has set the ENG ANTI ICE pb-sw to ON.

DESCRIPTION

Ident.: DSC-30-40-10-00017831.0001001 / 15 NOV 22
Applicable to: ALL

The aircraft uses electrical heating to anti-ice each windshield and defog the cockpit side windows. Two independent WHC, one on each side, automatically regulates the system, protects it against overheating, and indicates faults.

Window heating comes ON:
- Automatically when at least one engine is running, or when the aircraft is in flight
- Manually before engine start, when the flight crew switches ON the PROBE/WINDOW HEAT pb-sw.

The windshield heating operates at low power on ground and at normal power in flight.
Only one heating level exists for the windows.

Intentionally left blank

OVERHEAD PANEL

Ident.: DSC-30-40-20-00000461.0001001 / 21 MAR 16
Applicable to: ALL

(*Refer to DSC-30-50-20 Overhead Panel*)

Intentionally left blank

DESCRIPTION

Ident.: DSC-30-50-10-00017832.0001001 / 21 MAR 16
Applicable to: ALL

Electrical heating protects :
- Pitot probes
- Static ports
- Angle-Of-Attack (AOA) probes
- Total Air Temperature (TAT) probes.

Three independent Probe Heat Computers (PHC) automatically control and monitor :
- Captain probes
- F/O probes
- STBY probes.

They protect against overheating and indicate fault.

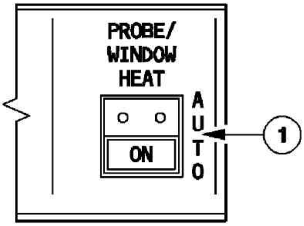
The probes are heated :
- automatically when at least one engine is running, or in flight
- manually, when the flight crew switches ON the PROBE/WINDOW HEAT pushbutton switch.

On the ground, the TAT probes are not heated and pitot heating operates at low level (the changeover to normal power in flight is automatic).

Intentionally left blank

OVERHEAD PANEL

Ident.: DSC-30-50-20-00017838.0001001 / 15 NOV 22
Applicable to: ALL



(1) PROBES/WINDOW HEAT pushbutton

AUTO	Probes/windows are automatically heated: - In flight, or - On ground (except TAT probes), provided one engine is running.
ON	The blue light indicates that the probes and windows are heated (except TAT probes on ground).

Note: *Ensure that the probe covers are removed before setting the PROBE/WINDOW HEAT pb-sw to ON.*

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DESCRIPTION

Ident.: DSC-30-55-10-00000525.0001001 / 21 MAR 16
Applicable to: ALL

An ice protection system is installed to prevent ice formation in the waste disposal system and the potable water system. Electrical heating elements in form of flexible tapes are attached to the waste/potable water lines which are installed in areas of possible icing conditions (in the vicinity of fuselage skin). Temperature sensors are installed to detect icing conditions. The fill/drain nipples on the water service/waste panel and the two drain masts are heated. The two Water Ice-Protection Control Units (WIPCU) installed operate independently : one controls the forward section of the ice protection system, the second one the aft section.

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SYSTEM OPERATION

Ident.: DSC-30-55-20-00000529.0001001 / 21 MAR 16
Applicable to: ALL

The temperature sensors measure permanently the water line temperature. In the WIPCU, the measured value is compared with a reference temperature for the related location. This threshold can be set individually for each area by maintenance action. If the temperature drops below the reference value the heating elements for the related area are turned on. A different (higher) threshold is used to turn the heating elements off.

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WIPERS

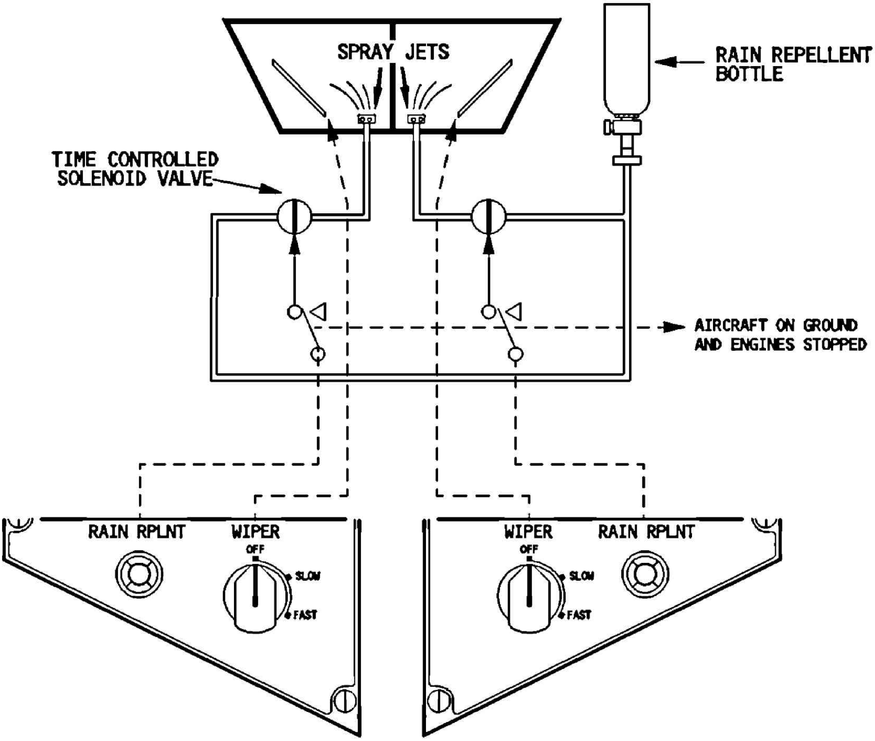
Ident.: DSC-30-60-10-00017842.0001001 / 21 MAR 16
Applicable to: ALL

Each front windshield has a two-speed electric wiper.
Each crewmember can control the speed of the wipers via a rotary selector.

RAIN REPELLENT SYSTEM

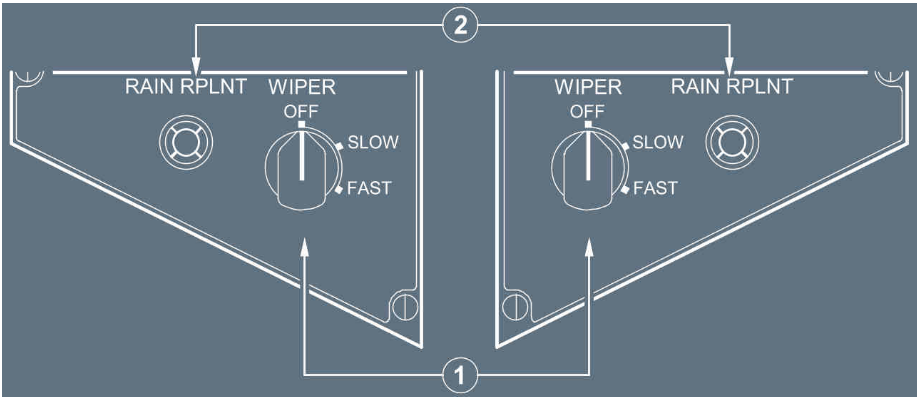
Ident.: DSC-30-60-10-00017950.0001001 / 21 MAR 16
Applicable to: ALL

In moderate to heavy rain, the flight crew can spray a rain repellent liquid on the windshield to improve visibility.
The window is covered by spray after about 30 s.
Separate pushbuttons control the rain repellent application on each side of the windshield.


SPRAY JETS
RAIN REPELLENT BOTTLE
TIME CONTROLLED SOLENOID VALVE
AIRCRAFT ON GROUND AND ENGINES STOPPED
RAIN RPLNT
WIPER
OFF
SLOW
FAST
WIPER
OFF
SLOW
FAST
RAIN RPLNT

OVERHEAD PANEL

Ident.: DSC-30-60-20-00000535.0001001 / 09 OCT 12
Applicable to: ALL

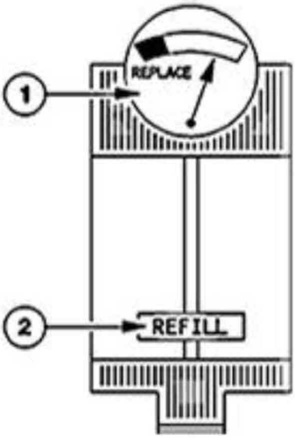


(1) WIPER sel
Each rotary selector controls its wiper at either low or high speed. When turned off the wiper stops out of view.

(2) RAIN RPLNT pb
Each of these button controls the application of rain repellent fluid to one side of the front windshield.
When the flight crew pushes the button, the timer applies a measured quantity of rain repellent to the windshield. To repeat the cycle the flight crew must push the button again.
This function is inhibited when the aircraft is on the ground, engines stopped.

RAIN REPELLENT SYSTEM INDICATORS ⩤

Ident.: DSC-30-60-20-00017979.0001001 / 21 MAR 16
Applicable to: ALL



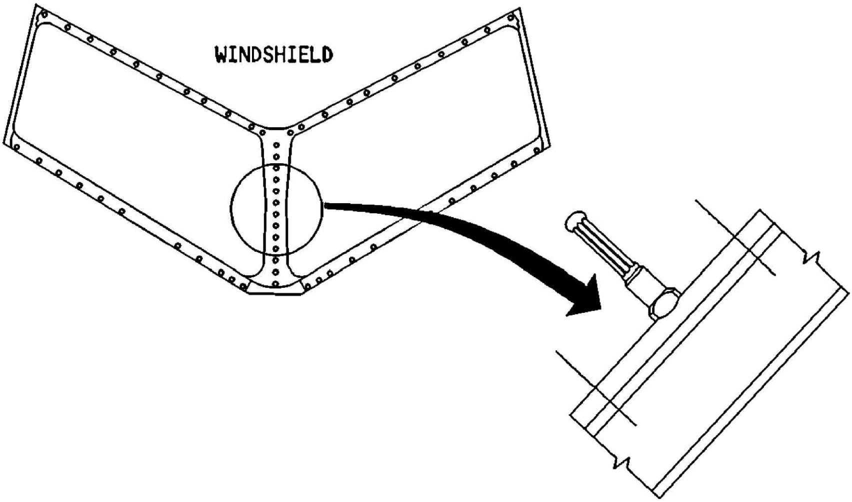
(1) Rain Repellent pressure indicator
This shows the nitrogen pressure and therefore the remaining fluid in the rain repellent bottle. When the needle is in the yellow sector the bottle should be replaced.

(2) Rain Repellent low level indicator (depending on aircraft configuration)
When REFILL float is in view, the bottle should be replaced.

VISUAL ICE INDICATOR

Ident.: DSC-30-70-10-00017846.0001001 / 21 MAR 16
Applicable to: ALL

An external visual ice indicator, which is visible to the crew, is installed between the two windshields. The indicator also has an external light ◁❄ .



ICE DETECTION SYSTEM

Ident.: DSC-30-70-10-00017849.0001001 / 21 MAR 16
Applicable to: ALL

The ice detection system has two separate ice detector probes on the forward lower section of the fuselage.
The system operates automatically and starts at electrical power up.
The probes detect ice accretion. They also indicate, through the MEMO display, that icing conditions have disappeared. The system logic generates ECAM messages according to ice detector signals and the flight crew's selection of engine or wing anti-ice systems.
The ice detection system does not control the ENG or WING anti-ice systems.

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AIRCRAFT SYSTEMS

INDICATING/RECORDING SYSTEMS

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DSC-31-05-10 Introduction

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DSC-31-05-20 Cockpit Arrangement

Cockpit Arrangement....A

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Display Management Computer (DMC)....B
System Data Acquisition Concentrator (SDAC)....C
Flight Warning Computer (FWC)....D
Attention-Getters....E
Loudspeaker....F
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DSC-31-05-60 Reconfiguring the DUS

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Amber dashes on the SD....F

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Altitude........F
Vertical Speed........G
Heading........H
Flight Path Vector........I
Guidance........J
Trajectory Deviation........K
Flight Mode Annunciator........L
Tail Strike Pitch Limit Indicator ....M
Altitude Alert........N
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Rose Modes........B
Rose LS Mode........C
Rose VOR Mode........D
ROSE NAV Mode/ARC Mode........E
Plan Mode........F
Weather Radar indication........G
Engine Standby Page........H
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DSC-31-50 EFIS Controls

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EFIS DMC Panel........B
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DSC-31-55 Clock

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General........A

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DSC-31-60-10 Flight Data Recording System

Description.... A

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DSC-31-60-30 Aircraft Condition Monitoring System (ACMS)

Description.... A
Controls on Pedestal.... B

INTRODUCTION

Ident.: DSC-31-05-10-00000367.0001001 / 22 MAR 16
Applicable to: ALL

The electronic instrument system (EIS) presents data on six identical display units (DUs):

- The electronic flight instrument system (EFIS) displays mostly flight parameters and navigation data on the primary flight displays (PFDs) and navigation displays (NDs)
- The electronic centralized aircraft monitor (ECAM) presents data on the engine/warning display (E/WD) and system display (SD) :
  - Primary engine indications, fuel quantity, flap and slat position
  - Warning and caution alerts or memos
  - Synoptic diagrams of aircraft systems, and status messages
  - Permanent flight data

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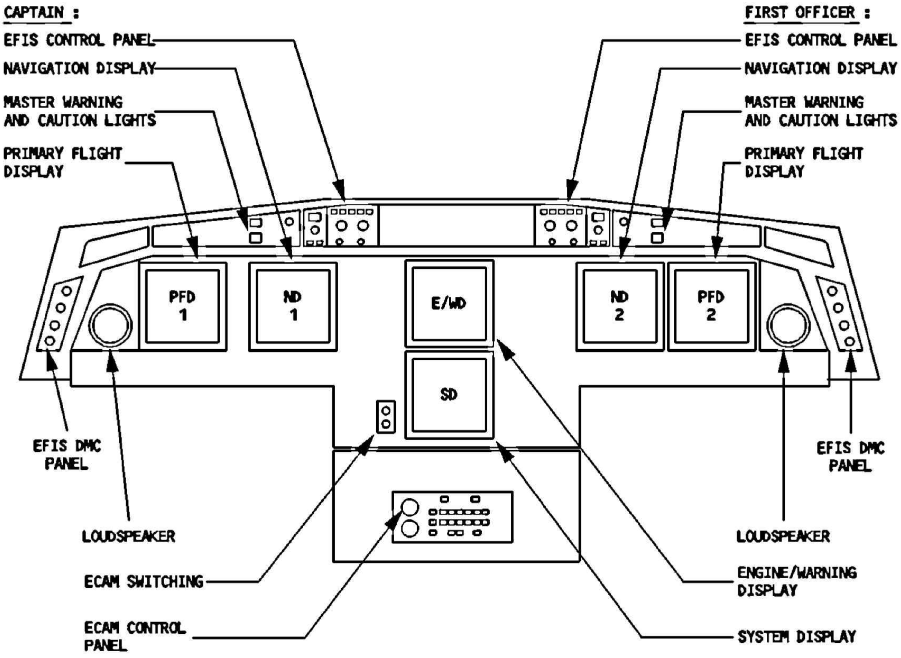
COCKPIT ARRANGEMENT

Ident.: DSC-31-05-20-00000370.0001001 / 22 MAR 16
Applicable to: ALL


CAPTAIN :
EFIS CONTROL PANEL
NAVIGATION DISPLAY
MASTER WARNING AND CAUTION LIGHTS
PRIMARY FLIGHT DISPLAY
FIRST OFFICER :
EFIS CONTROL PANEL
NAVIGATION DISPLAY
MASTER WARNING AND CAUTION LIGHTS
PRIMARY FLIGHT DISPLAY
PFD 1
ND 1
E/WD
ND 2
PFD 2
SD
EFIS DMC PANEL
LOUDSPEAKER
ECAM SWITCHING
ECAM CONTROL PANEL
EFIS DMC PANEL
LOUDSPEAKER
ENGINE/WARNING DISPLAY
SYSTEM DISPLAY

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DISPLAY UNIT(DU)

Ident.: DSC-31-05-30-00000377.0002001 / 21 MAR 16
Applicable to: ALL

The instrument panels have six identical units.
These DUs are full-color Liquid Crystal Displays (LCD).

DISPLAY MANAGEMENT COMPUTER (DMC)

Ident.: DSC-31-05-30-00000379.0002001 / 21 MAR 16
Applicable to: ALL

Three identical Display Management Computers (DMCs) obtain data from the different sensors and computers, and send it to the display units. The display units then generate and display the applicable images. Each DMC has a single DMC channel, and can simultaneously supply one PFD, one ND, and both ECAM display units (E/WD and SD).

SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC)

Ident.: DSC-31-05-30-00000383.0001001 / 22 MAR 16
Applicable to: ALL

The two identical SDACs acquire data, then generate signals. Some of these signals go to the three DMCs, which use them to generate displays of system pages and engines parameters. Others go to the flight warning computers which use them to generate ECAM messages and aural alerts.

FLIGHT WARNING COMPUTER (FWC)

Ident.: DSC-31-05-30-00000387.0001001 / 21 MAR 16
Applicable to: ALL

The two identical FWCs generate alert messages, memos, aural alerts, and synthetic voice messages. For this purpose they acquire data:
- directly from aircraft sensors or systems to generate red warnings
- through the SDACs to generate amber cautions.

The ECAM display units display the alert messages generated by the FWCs.

The FWCs also generate:
- radio height callouts
- decision height callouts
- landing speed increments.

ATTENTION-GETTERS

Ident.: DSC-31-05-30-00000391.0001001 / 21 MAR 16
Applicable to: ALL

The FWCs also drive the attention-getters. Each pilot has a set of these on the panel under the glareshield. They are :

- a master warning light that flashes “MASTER WARN” in red for red warnings
- a master caution light that illuminates “MASTER CAUT” in amber for amber cautions.

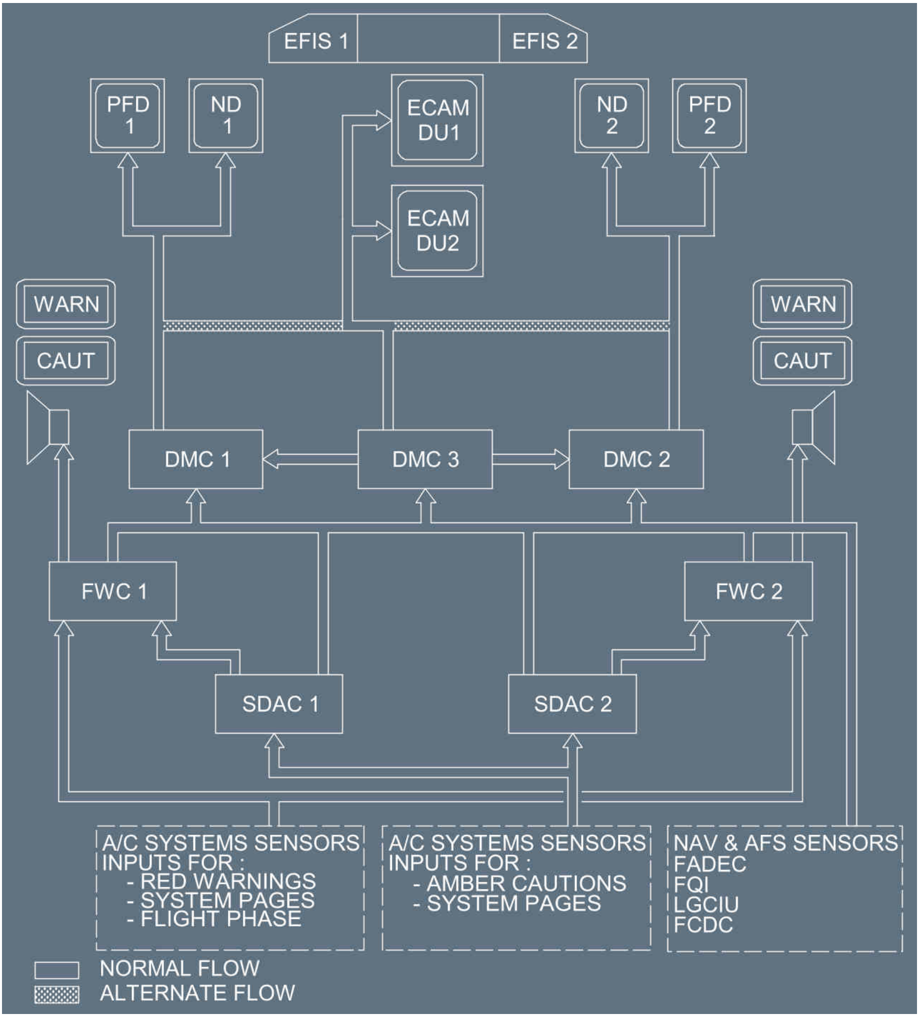
LOUDSPEAKER

Ident.: DSC-31-05-30-00000393.0001001 / 21 MAR 16
Applicable to: ALL

The communications loudspeakers announce aural alerts and voice messages, and do so even when they are turned off.

EIS BLOCK DIAGRAM

Ident.: DSC-31-05-30-00000397.0002001 / 09 OCT 12
Applicable to: ALL


EFIS 1
EFIS 2
PFD 1
ND 1
ECAM DU1
ECAM DU2
ND 2
PFD 2
WARN
CAUT
WARN
CAUT
DMC 1
DMC 3
DMC 2
FWC 1
FWC 2
SDAC 1
SDAC 2
A/C SYSTEMS SENSORS INPUTS FOR :
- RED WARNINGS
- SYSTEM PAGES
- FLIGHT PHASE
A/C SYSTEMS SENSORS INPUTS FOR :
- AMBER CAUTIONS
- SYSTEM PAGES
NAV & AFS SENSORS
FADEC
FQI
LGCIU
FCDC
NORMAL FLOW
ALTERNATE FLOW

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ECAM CONTROL PANEL (ECP)

Ident.: DSC-31-05-40-00000400.0001001 / 21 MAR 16
Applicable to: ALL

This panel allows the pilot to have the ECAM display units display either warning and caution messages or system and system status images.

ECAM DMC SWITCHING

Ident.: DSC-31-05-40-00000402.0001001 / 21 MAR 16
Applicable to: ALL

A switch on the ECAM SWITCHING panel which is on the main instrument panel allows the flight crew to replace the DMC 3 with DMC 1 or DMC 2.

ECAM/ND SWITCHING

Ident.: DSC-31-05-40-00000405.0001001 / 21 MAR 16
Applicable to: ALL

A switch on the ECAM SWITCHING panel allows the flight crew to transfer the ECAM system display to either the captain's or the first officer's navigation display.

PFD/ND SWITCHING

Ident.: DSC-31-05-40-00000406.0001001 / 21 MAR 16
Applicable to: ALL

A PFD/ND XFR pushbutton on each side console allows the pilot to swap displays on respective onside DUs.

EFIS DMC SWITCHING

Ident.: DSC-31-05-40-00000408.0001001 / 21 MAR 16
Applicable to: ALL

A switch on each side console allows the pilot to manually select the DMC 3 or the opposite DMC for supply of data to the onside PFD/ND.

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RECONFIGURING THE DISPLAY MANAGEMENT COMPUTER (DMC)

Ident.: DSC-31-05-50-00000409.0002001 / 21 MAR 16
Applicable to: ALL

In normal operation :
- DMC 1 supplies data to the Captain's PFD and ND.
- DMC 2 supplies data to the First Officer's PFD and ND.
- DMC 3 supplies data to the upper and lower ECAM DU.

If a DMC fails, the corresponding DU displays the INVALID DATA message. The flight crew can replace DMC 1 or 2 with DMC 3 by turning the EFIS DMC selector, on the EFIS DMC panel, to 3.
In case of DMC 3 failure, DMC 1 automatically takes over and supplies the ECAM DUs, provided the ECAM SWITCHING selector is in the AUTO position.

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FAILURE OF UPPER ECAM DU (OR CTL/BRIGHTNESS KNOB TURNED TO OFF)

Ident.: DSC-31-05-60-00000411.0001001 / 21 MAR 16
Applicable to: ALL

If the upper ECAM display fails, or is switched off :
- The engine/warning page automatically replaces the system/status page on the lower ECAM DU.

The flight crew can display the system/status page by :
- Using the “ECAM/ND XFR” switch, on the ECAM SWITCHING panel, to move it to a navigation display unit (NDU), or
- Pushing and holding (for a maximum of 3 min) the related system page pushbutton, on the ECAM control panel, to temporarily display it on the lower ECAM DU (instead of the engine/warning page).

FAILURE OF LOWER ECAM DU (OR CTL/BRIGHTNESS KNOB TURNED TO OFF)

Ident.: DSC-31-05-60-00000415.0001001 / 21 MAR 16
Applicable to: ALL

If the lower ECAM display fails, or is switched off, the flight crew can display the system/status page by :
- Using the “ECAM/ND XFR” switch, on the ECAM SWITCHING panel, to display it on the NDU, or
- Pushing and holding (for a maximum of 3 min) the related system page pushbutton on the ECAM control panel, to temporarily display it on the upper ECAM DU (instead of the engine/warning page).

FAILURE OF BOTH ECAM DUS

Ident.: DSC-31-05-60-00000418.0001001 / 21 MAR 16
Applicable to: ALL

If both ECAM displays fail, the flight crew may :
- Use the “ECAM/ND XFR”, on the ECAM SWITCHING panel, to display the engine/warning page on a navigation display and, if needed,
- Push and hold (for a maximum of 3 min) the related system page pushbutton, on the ECAM control panel, to temporarily display the system/status page on an ND.

PFD/NDU RECONFIGURATION

Ident.: DSC-31-05-60-00000423.0001001 / 21 MAR 16
Applicable to: ALL

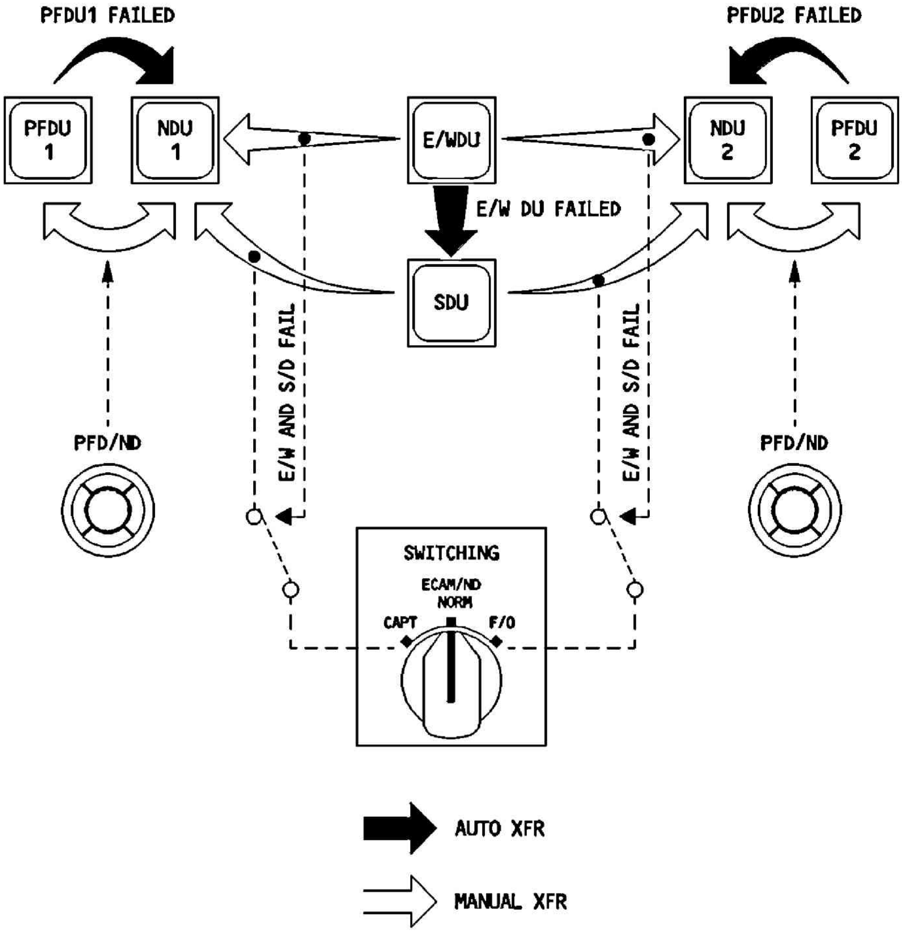
If a PFDU fails, the system automatically transfers the PFD to the NDU.

The pilot can also make this transfer manually by :
- turning the PFD ON-OFF/brightness control OFF, or
- pressing the PFD/ND/XFR pushbutton, which cross-changes the images between the PFDU and the NDU.

If an NDU fails, the pilot can use the PFD/ND/XFR pushbutton to transfer the ND image to the PFDU.

DU RECONFIGURATION

Ident.: DSC-31-05-60-00000425.0001001 / 21 MAR 16
Applicable to: ALL


PFDU1 FAILED
PFDU2 FAILED
PFDU 1
NDU 1
E/WDU
NDU 2
PFDU 2
E/W DU FAILED
SDU
E/W AND S/D FAIL
E/W AND S/D FAIL
PFD/ND
PFD/ND
SWITCHING
ECAM/ND
NORM
CAPT
F/O
AUTO XFR
MANUAL XFR

MESSAGES ON THE DISPLAY UNIT (DUS)

Applicable to: ALL

Ident.: DSC-31-05-60-A-00012970.0001001 / 14 FEB 11

These messages are displayed on either the EFIS or the ECAM Display Unit (DU) depending on the current EFIS or ECAM configuration.

Ident.: DSC-31-05-60-A-00012972.0001001 / 14 AUG 12

FAILURE OF A DU

If a DU fails, the flight crew may find one of the following displays:

- A blank screen with a “F” letter in amber, or
- A distorted display, or
- A blank screen with the “INVALID DISPLAY UNIT” message in amber.

Ident.: DSC-31-05-60-A-00012974.0001001 / 14 FEB 11

FEEDBACK MESSAGES

The DU displays the following messages in amber when the Display Management Computer (DMC) detects a discrepancy between the parameters obtained by the DMC and the operational parameters displayed on the DU:

- ”CHECK CAPT PFD” (“CHECK F/O PFD”) if the discrepancy concerns the PFD parameters
- ”CHECK CAPT ND” (“CHECK F/O ND”) if the discrepancy concerns the ND parameters
- ”CHECK EWD” if the discrepancy concerns the E/WD parameters
- ”CHECK SD” if the discrepancy concerns the SD parameters.

In addition, if the aircraft is on ground, the “DU NOT MONITORED” message is displayed in amber when there is only one DMC, instead of two DMCs, that provides the affected DU with feedback information. This message means that there is either a DMC test in progress or that there is an EIS failure. In the case of an EIS failure, a maintenance action is necessary.

Ident.: DSC-31-05-60-A-00012975.0001001 / 04 NOV 21

The DU displays the following messages along with a caution on the ECAM E/WD.

CHECK ATT	Attitude data displayed on both PFDs differ by more than 5 ° in pitch and/or roll.

CHECK ALT	Altitude data displayed on both PFDs differ by: - More than 250 ft when the flight crew selects a QNH different from STD, or - More than 500 ft when the flight crew selects a QNH STD. *Note:* *The caution and the CHECK ALT message disappear, when the CAPT EFIS and the F/O EFIS barometer references disagree.*
CHECK HDG	Heading data displayed on both PFDs and NDs differ by more than 5 °. *Note:* - *The CHECK HDG message flashes for a few seconds on the NDs, and then remains steady.* - *If the flight crew selects the PLAN mode on the NDs, the message is not displayed.*

Ident.: DSC-31-05-60-A-00012977.0001001 / 14 FEB 11

DU RESET

In the case of a DU reset, the message “SELF TEST IN PROGRESS” can be displayed in green and/or the message “WAITING FOR DATA” may be displayed in green during the EIS initialization.

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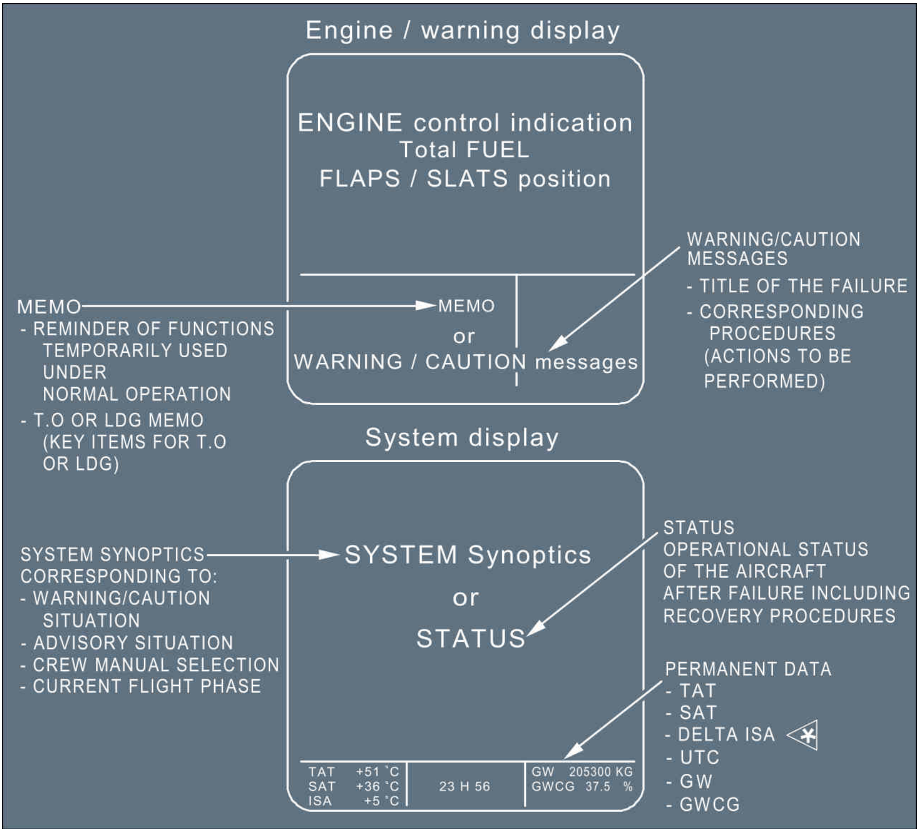
ECAM DU ARRANGEMENT

Ident.: DSC-31-10-00017660.0001001 / 21 MAR 16
Applicable to: ALL

The ECAM has two display units:
- One for the engine/warning display (E/WD).
- One for the system/status display (SD).


Engine / warning display
ENGINE control indication
Total FUEL
FLAPS / SLATS position
MEMO
or
WARNING / CAUTION messages
MEMO
- REMINDER OF FUNCTIONS TEMPORARILY USED UNDER NORMAL OPERATION
- T.O OR LDG MEMO (KEY ITEMS FOR T.O OR LDG)
WARNING/CAUTION MESSAGES
- TITLE OF THE FAILURE
- CORRESPONDING PROCEDURES (ACTIONS TO BE PERFORMED)
System display
SYSTEM Synoptics
or
STATUS
SYSTEM SYNOPTICS CORRESPONDING TO:
- WARNING/CAUTION SITUATION
- ADVISORY SITUATION
- CREW MANUAL SELECTION
- CURRENT FLIGHT PHASE
STATUS
OPERATIONAL STATUS OF THE AIRCRAFT AFTER FAILURE INCLUDING RECOVERY PROCEDURES
PERMANENT DATA
- TAT
- SAT
- DELTA ISA
- UTC
- GW
- GWCG
TAT +51 °C
SAT +36 °C
ISA +5 °C
23 H 56
GW 205300 KG
GWCG 37.5 %

COLOR CODE

Ident.: DSC-31-10-00000431.0001001 / 21 MAR 16
Applicable to: ALL

The ECAM display uses a color code that indicates the importance of the failure or the indication.

RED : The configuration or failure requires immediate action.
AMBER : The flight crew should be aware of the configuration or failure, but needs not take immediate action.
GREEN : The item is operating normally.
WHITE : These titles and remarks guide the flight crew as it executes various procedures.
BLUE : These are actions to be carried out, or limitations.
MAGENTA : These are particular messages that apply to particular pieces of equipment or situations (inhibition messages, for example).

WARNING/CAUTION CLASSIFICATION

Ident.: DSC-31-10-00000436.0001001 / 21 MAR 16
Applicable to: ALL

	LEVEL	SIGNIFICATION	AURAL	VISUAL
FAILURE MODE	Level 3	Red warning: The configuration or failure requires immediate action : - Aircraft in dangerous configuration or limit flight conditions (eg: stall, o/speed) - System failure altering flight safety (eg : Eng fire, excess cab alt)	Continuous Repetitive Chime (CRC) or specific sound or synthetic voice	- MASTER WARN light red flashing or specific red light - Warning message (red) on E/WD - Automatic call of the relevant system page on the S/D (1)

	Level 2	Amber caution:
		The flight crew should be aware of the configuration or failure, but does not need to take any immediate action. However, time and situation permitting, these cautions should be considered without delay to prevent any further degradation of the affected system :
		- System failure without any direct consequence on the flight safety (eg : HYD B SYS LO PR).
			Single Chime (SC)	- MASTER CAUT light, amber steady :
				  - Caution message (amber) on E/WD
				  - Automatic call of the relevant system page on the S/D (1).

	Level 1	Amber caution : Requires crew monitoring : - Failures leading to a loss of redundancy or system degradation (eg : FCDC fault)	NONE	- Caution message (amber) on E/WD, generally without procedure.

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	LEVEL	SIGNIFICATION	AURAL	VISUAL
INFORMATION	ADVISORY	System parameters' monitoring	NONE	- Automatic call of the relevant system page on the S/D. The affected parameter pulses green.
	MEMO	Information : Recalls normal or automatic selection of functions which are temporarily used.	NONE	- Green, Amber, or Magenta message on E/WD

(1) *except in some cases*

PRIORITY RULES

Ident.: DSC-31-10-00000445.0001001 / 17 MAR 17
Applicable to: ALL

There are three priority levels for warnings and cautions :
A level 3 warning has priority over a level 2 caution which has priority over a level 1 caution.
The FWC observes these priorities.

INFORMATION PROVIDED WHEN NEEDED

One of the main advantages of the ECAM is that it displays applicable information to the flight crew, on an "as needed" basis.

The following outlines the ECAM's operating modes:

- **Normal Mode**:
  Automatically displays systems and memos, in accordance with the flight phase.
- **Failure Mode**:
  Automatically displays the appropriate emergency/abnormal procedures, in addition to their associated system synoptic.
- **Advisory Mode**:
  Automatically displays the appropriate system synoptic, associated with a drifting parameter.
- **Manual Mode**:
  Enables the flight crew to manually select any system synoptic via the ECAM Control Panel (ECP).

Most warnings and cautions are inhibited during critical phases of flight (T/O INHIBIT – LDG INHIBIT), because most system failures will not affect the aircraft's ability to continue a takeoff or landing.

TYPES OF FAILURES

Ident.: DSC-31-10-00000447.0001001 / 09 MAY 17
Applicable to: ALL

Independent :	a failure that affects an isolated system or item of equipment without degrading the performance of others in the aircraft.
Primary :	a failure of a system or an item of equipment that costs the aircraft the use of other systems or items of equipment.
Secondary :	the loss of a system or an item of equipment resulting from a primary failure.

AUDIO INDICATORS

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION(a)
Ident.: DSC-31-10-A-00015300.0001001 / 22 JUL 16			
CONTINUOUS REPETITIVE CHIME	RED WARNINGS	PERMANENT	Press MASTER WARN lt
Ident.: DSC-31-10-A-00015301.0001001 / 22 JUL 16			
SINGLE CHIME	AMBER CAUTION	0.5 s	
Ident.: DSC-31-10-A-00015302.0001001 / 14 OCT 15			
CALVARY CHARGE	AP DISCONNECTION BY TAKEOVER pb	1.5 s	Second press of TAKEOVER pb
	AP DISCONNECTION DUE TO FAILURE	PERMANENT	Press MASTER WARN lt or TAKEOVER pb
Ident.: DSC-31-10-A-00015303.0006001 / 22 JUL 16			
TRIPLE CLICK	LANDING CAPABILITY CHANGE or in case of mode reversion	0.5 s (3 pulses)	
Ident.: DSC-31-10-A-00015305.0001001 / 14 OCT 15			
“STALL, STALL” synthetic voice then cricket	STALL	PERMANENT	NIL
Ident.: DSC-31-10-A-00015306.0001001 / 14 OCT 15			
INTERMITTENT BUZZER	SELCAL CALL	PERMANENT	Press RESET key on ACP
Ident.: DSC-31-10-A-00015307.0001001 / 14 OCT 15			
BUZZER	CABIN CALL	3 s	NIL
	EMER CABIN CALL	3 s REPEATED 3 times	NIL
	MECH CALL	As long as outside pb is pressed	NIL
	ACARS ◁✻ CALL or ALERT	PERMANENT	Read message on MCDU, or press MASTER CAUT pb
Ident.: DSC-31-10-A-00015308.0001001 / 14 OCT 15			
C CHORD	ALTITUDE ALERT (*Refer to DSC-31-40 Altitude Alert*)	1.5 s or PERMANENT	New ALTITUDE selection, or press MASTER WARN pb

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AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION[(a)]
Ident.: DSC-31-10-A-00015309.0001001 / 21 MAR 16			
AUTO CALL OUT (synthetic voice)	HEIGHT ANNOUNCEMENT BELOW 2 500 ft (*Refer to DSC-34-10-40-10 Automatic Callout*)	PERMANENT	NIL
Ident.: DSC-31-10-A-00015310.0001001 / 21 MAR 17			
GROUND PROXIMITY WARNING (synthetic voice)	(*Refer to DSC-34-20-40-10 Overview*)	PERMANENT	NIL
Ident.: DSC-31-10-A-00015311.0001001 / 14 OCT 15			
“WINDSHEAR” (synthetic voice)	WINDSHEAR	REPEATED 3 times	NIL
Ident.: DSC-31-10-A-00015312.0001001 / 14 OCT 15			
“PRIORITY LEFT” “PRIORITY RIGHT” (synthetic voice)	AP TAKEOVER pb	1 s	NIL
Ident.: DSC-31-10-A-00015313.0001001 / 14 OCT 15			
“V1” (synthetic voice)	V1 speed during takeoff	1 time	NIL
Ident.: DSC-31-10-A-00015314.0001001 / 07 JUN 16			
“RETARD” (Synthetic voice)	Thrust levers not in IDLE position for landing	ONE TIME at 20 ft (10 ft in autoland with A/THR ON), then PERMANENT until thrust levers are set to IDLE	NIL
Ident.: DSC-31-10-A-00015315.0001001 / 21 MAR 17			
TCAS (Synthetic voice)	(*Refer to DSC-34-20-60-20 Aural Messages*)	PERMANENT	NIL
Ident.: DSC-31-10-A-00015316.0001001 / 14 OCT 15			
″SPEED, SPEED, SPEED ″ (Synthetic voice)	Current thrust is not sufficient to recover a positive flight through pitch control	Every 5 s until thrust is increased	THRUST LEVER(s)
Ident.: DSC-31-10-A-00015317.0001001 / 14 OCT 15			
"DUAL INPUT" (synthetic voice)	Both sidesticks are moved simultaneously	Every 5 s	One sidestick deactivated

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Ident.: DSC-31-10-A-00015318.0001001 / 14 OCT 15

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION[a]
"PITCH, PITCH" (synthetic voice)	The aircraft pitch attitude is becoming excessive during flare and landing.	one time	NIL

[a] *All audio indicators may be cancelled by pressing either:*
- *The EMER CANC pushbutton on the ECAM control panel, or*
- *The MASTER WARN light (except for some warnings like OVERSPEED, or L/G NOT DOWN).*

AUDIO INDICATORS

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION[(a)]

Ident.: DSC-31-10-A-00015300.0001001 / 22 JUL 16

CONTINUOUS REPETITIVE CHIME	RED WARNINGS	PERMANENT	Press MASTER WARN lt

Ident.: DSC-31-10-A-00015301.0001001 / 22 JUL 16

SINGLE CHIME	AMBER CAUTION	0.5 s	

Ident.: DSC-31-10-A-00015302.0001001 / 14 OCT 15

CALVARY CHARGE	AP DISCONNECTION BY TAKEOVER pb	1.5 s	Second press of TAKEOVER pb
	AP DISCONNECTION DUE TO FAILURE	PERMANENT	Press MASTER WARN lt or TAKEOVER pb

Ident.: DSC-31-10-A-00015303.0006001 / 22 JUL 16

TRIPLE CLICK	LANDING CAPABILITY CHANGE or in case of mode reversion	0.5 s (3 pulses)	

Ident.: DSC-31-10-A-00015305.0001001 / 14 OCT 15

“STALL, STALL” synthetic voice then cricket	STALL	PERMANENT	NIL

Ident.: DSC-31-10-A-00015306.0001001 / 14 OCT 15

INTERMITTENT BUZZER	SELCAL CALL	PERMANENT	Press RESET key on ACP

Ident.: DSC-31-10-A-00015307.0001001 / 14 OCT 15

BUZZER	CABIN CALL	3 s	NIL
	EMER CABIN CALL	3 s REPEATED 3 times	NIL
	MECH CALL	As long as outside pb is pressed	NIL
	ACARS ◁ CALL or ALERT	PERMANENT	Read message on MCDU, or press MASTER CAUT pb

Ident.: DSC-31-10-A-00015308.0001001 / 14 OCT 15

C CHORD	ALTITUDE ALERT (*Refer to DSC-31-40 Altitude Alert*)	1.5 s or PERMANENT	New ALTITUDE selection, or press MASTER WARN pb

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Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION(a)
Ident.: DSC-31-10-A-00015309.0001001 / 21 MAR 16			
AUTO CALL OUT (synthetic voice)	HEIGHT ANNOUNCEMENT BELOW 2 500 ft (*Refer to DSC-34-10-40-10 Automatic Callout*)	PERMANENT	NIL
Ident.: DSC-31-10-A-00015310.0001001 / 21 MAR 17			
GROUND PROXIMITY WARNING (synthetic voice)	(*Refer to DSC-34-20-40-10 Overview*)	PERMANENT	NIL
Ident.: DSC-31-10-A-00015311.0001001 / 14 OCT 15			
"WINDSHEAR" (synthetic voice)	WINDSHEAR	REPEATED 3 times	NIL
Ident.: DSC-31-10-A-00015312.0001001 / 14 OCT 15			
"PRIORITY LEFT" "PRIORITY RIGHT" (synthetic voice)	AP TAKEOVER pb	1 s	NIL
Ident.: DSC-31-10-A-00015313.0001001 / 14 OCT 15			
"V1" (synthetic voice)	V1 speed during takeoff	1 time	NIL
Ident.: DSC-31-10-A-00015314.0001001 / 07 JUN 16			
"RETARD" (Synthetic voice)	Thrust levers not in IDLE position for landing	ONE TIME at 20 ft (10 ft in autoland with A/THR ON), then PERMANENT until thrust levers are set to IDLE	NIL
Ident.: DSC-31-10-A-00015315.0001001 / 21 MAR 17			
TCAS (Synthetic voice)	(*Refer to DSC-34-20-60-20 Aural Messages*)	PERMANENT	NIL
Ident.: DSC-31-10-A-00015316.0001001 / 14 OCT 15			
″SPEED, SPEED, SPEED ″ (Synthetic voice)	Current thrust is not sufficient to recover a positive flight through pitch control	Every 5 s until thrust is increased	THRUST LEVER(s)

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Continued from the previous page

AUDIO INDICATORS	MEANING	DURATION	AUDIO INDICATOR CANCELLATION[a]
Ident.: DSC-31-10-A-00015317.0001001 / 14 OCT 15			
"DUAL INPUT" (synthetic voice)	Both sidesticks are moved simultaneously	Every 5 s	One sidestick deactivated

[a] *All audio indicators may be cancelled by pressing either:*
- *The EMER CANC pushbutton on the ECAM control panel, or*
- *The MASTER WARN light (except for some warnings like OVERSPEED, or L/G NOT DOWN).*

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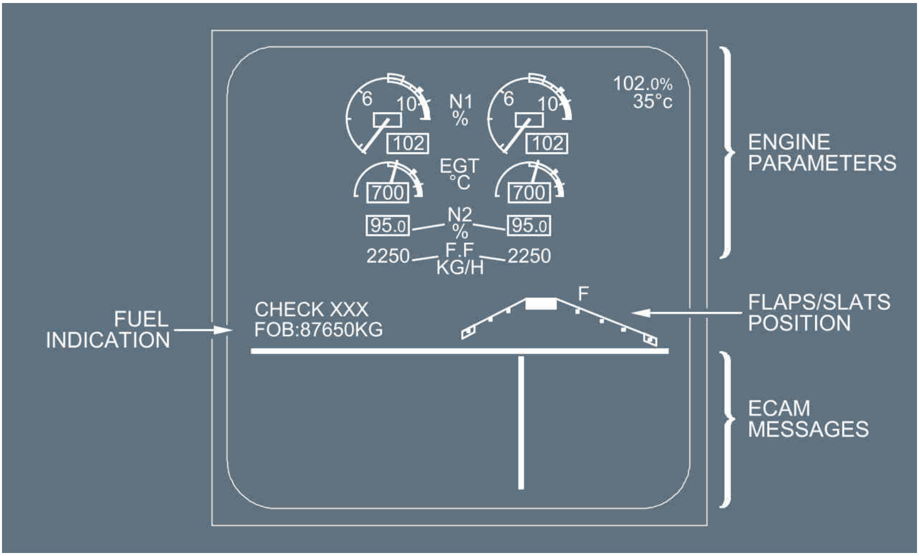
GENERAL

Ident.: DSC-31-15-00000467.0008001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The Engine Warning Display (E/WD) appears on the upper ECAM Display Unit (DU).

- The upper part of this DU displays:
  - Engine parameters (Controls and Indicators)
  - Feedback messages (*Refer to DSC-31-05-60 Messages on the Display Units (DUs) - Feedback Messages*)
  - Fuel on board (FOB) (*Refer to DSC-28-20 ECAM Upper Display*)
  - Position of slats and flaps (*Refer to DSC-27-20-30 ECAM F/CTL Page*)
- The lower part of this DU displays messages generated by the FWC:
  - Warning and caution messages when a failure occurs,
  - Memos when there is no failure.


102.0%
35°c
6
10
N1
%
102
102
EGT
°C
700
700
N2
%
95.0
95.0
F.F
KG/H
2250
2250
ENGINE
PARAMETERS
FUEL
INDICATION
CHECK XXX
FOB:87650KG
F
FLAPS/SLATS
POSITION
ECAM
MESSAGES

The lower part of the DU dedicated to ECAM messages, is divided into two sections that have several lines each.

Left part : - Primary or independent warnings and cautions, or
- Memo information.

Right part : - Title of system affected by a primary or independent warning, or caution, in the case of overflow on the left part, or
- Secondary failure, or
- Memo, or
- Special lines (e.g as “AP OFF”, “LAND ASAP”).

As soon as the FWC detects a failure, and if no flight phase inhibition is active, the E/WD displays the title of the failure and the actions that the flight crew must perform.
The action line automatically clears when the flight crew performs the necessary action.

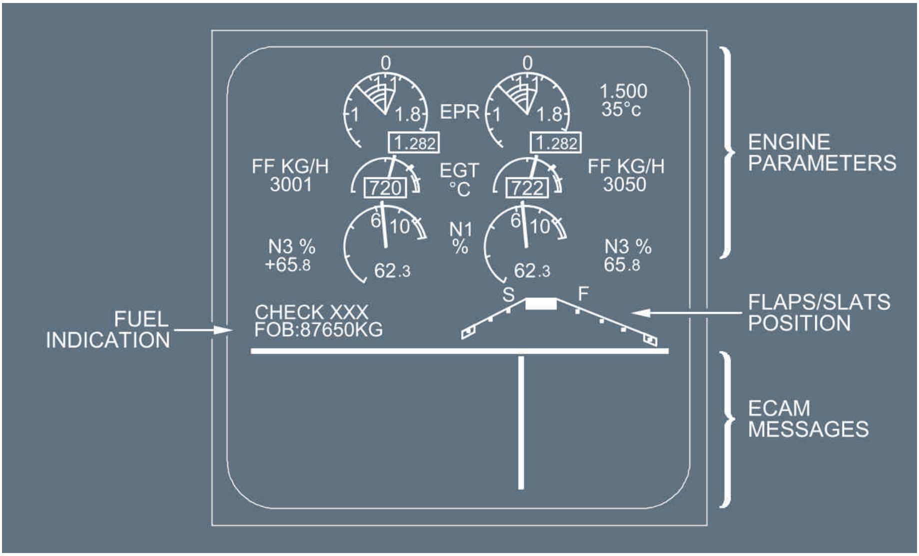
Note: *Some action lines do not disappear from the E/WD even after the flight crew performs the necessary action.*

GENERAL

Ident.: DSC-31-15-00000467.0010001 / 21 MAR 17
Applicable to: LV-KHT, LV-KHU

The Engine Warning Display (E/WD) appears on the upper ECAM Display Unit (DU).

- The upper part of this DU displays:
  - Engine parameters (*Refer to DSC-70-90-40 Engine/Warning Display*)
  - Feedback messages (*Refer to DSC-31-05-60 Messages on the Display Units (DUs) - Feedback Messages*)
  - Fuel on board (FOB) (*Refer to DSC-28-20 ECAM Upper Display*)
  - Position of slats and flaps (*Refer to DSC-27-20-30 ECAM F/CTL Page*)
- The lower part of this DU displays messages generated by the FWC:
  - Warning and caution messages when a failure occurs,
  - Memos when there is no failure.


0
0
1
1.8
EPR
1
1.8
1.500
35°c
1.282
1.282
FF KG/H
3001
EGT
°C
FF KG/H
3050
720
722
6
10
N1
%
6
10
N3 %
+65.8
62.3
62.3
N3 %
65.8
S
F
CHECK XXX
FOB:87650KG
FUEL
INDICATION
ENGINE
PARAMETERS
FLAPS/SLATS
POSITION
ECAM
MESSAGES

The lower part of the DU dedicated to ECAM messages, is divided into two sections that have several lines each.

Left part :
- Primary or independent warnings and cautions, or
- Memo information.

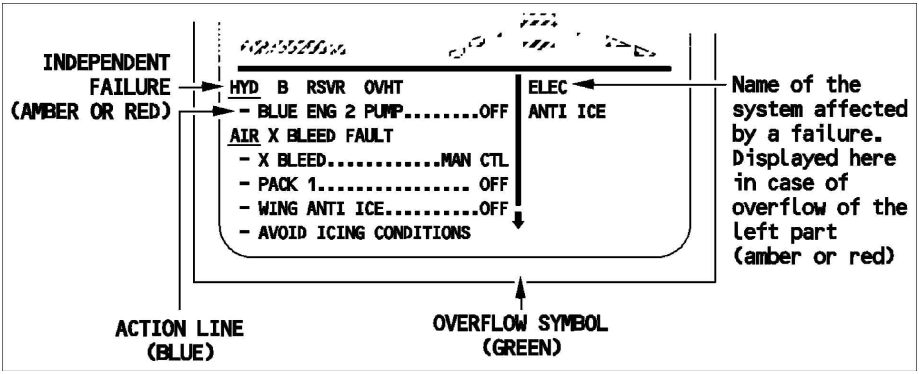
Right part :
- Title of system affected by a primary or independent warning, or caution, in the case of overflow on the left part, or
- Secondary failure, or
- Memo, or
- Special lines (e.g as “AP OFF”, “LAND ASAP”).

As soon as the FWC detects a failure, and if no flight phase inhibition is active, the E/WD displays the title of the failure and the actions that the flight crew must perform.
The action line automatically clears when the flight crew performs the necessary action.

Note: *Some action lines do not disappear from the E/WD even after the flight crew performs the necessary action.*

INDEPENDENT FAILURE

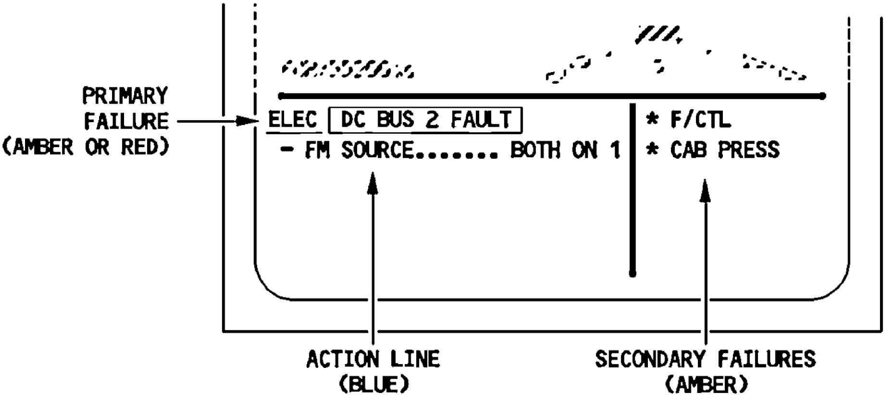
Ident.: DSC-31-15-00000471.0001001 / 21 MAR 16
Applicable to: ALL


INDEPENDENT FAILURE (AMBER OR RED)
HYD B RSVR OVHT
- BLUE ENG 2 PUMP........OFF
AIR X BLEED FAULT
- X BLEED...........MAN CTL
- PACK 1................ OFF
- WING ANTI ICE..........OFF
- AVOID ICING CONDITIONS
ELEC
ANTI ICE
Name of the system affected by a failure. Displayed here in case of overflow of the left part (amber or red)
ACTION LINE (BLUE)
OVERFLOW SYMBOL (GREEN)

If there are too many ECAM messages for the amount of space available in the lower part of the E/WD, a green arrow appears at the bottom of the display, pointing down to show that the information has overflowed off the screen. The pilot can scroll down to view additional messages by pushing the CLR pushbutton on the ECAM control panel (on the pedestal, just below the lower ECAM DU).

PRIMARY AND SECONDARY FAILURES

Ident.: DSC-31-15-00000474.0001001 / 21 MAR 16
Applicable to: ALL


PRIMARY
FAILURE
(AMBER OR RED)
ELEC
DC BUS 2 FAULT
- FM SOURCE....... BOTH ON 1
* F/CTL
* CAB PRESS
ACTION LINE
(BLUE)
SECONDARY FAILURES
(AMBER)

The ECAM DU displays a primary failure as a boxed title.
It identifies a secondary failure by putting a star in front of the title of the affected system.

Note: *The DU displays the overflow symbol, if primary or secondary failures overflow. In case of ECAM SINGLE DISPLAY, the secondary failures are inhibited.*

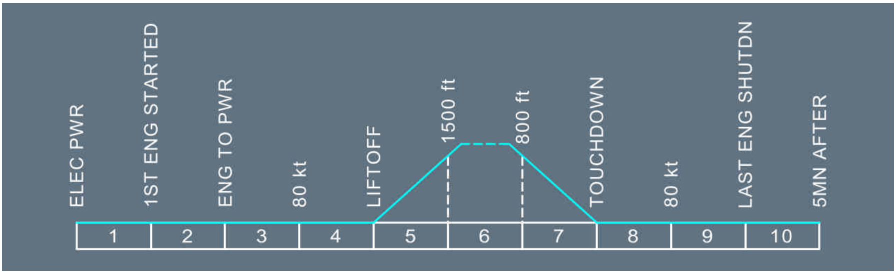
FLIGHT PHASES

Applicable to: ALL

Ident.: DSC-31-15-B-00000484.0001001 / 21 MAR 16

GENERAL

The FWC divides its functions according to these ten flight phases:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

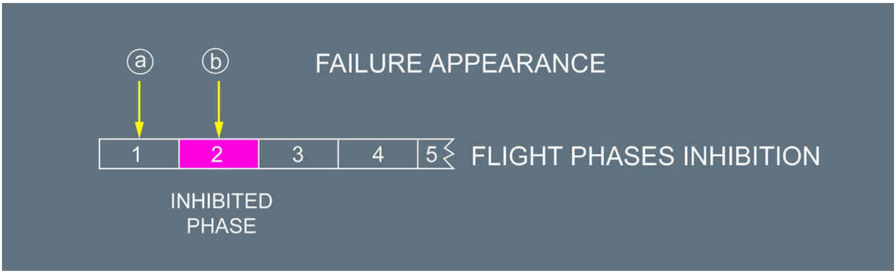
To improve its operational efficiency, the computer inhibits some warnings and cautions for certain flight phases. It does so to avoid unnecessarily alerting the pilots at times when they have high workloads (such as takeoff or landing). In these two phases, the DU displays magenta memos: “T.O. INHIBIT” (flight phases 3, 4, and 5), and “LDG INHIBIT” (flight phases 7 and 8).

Note: *These flight phases are different from, and independent of, the ones used by FMGEC.*

Ident.: DSC-31-15-B-00004743.0001001 / 21 MAR 16

FLIGHT PHASE INHIBITION

Two cases are possible (for instance) :


ⓐ
ⓑ
FAILURE APPEARANCE
1
2
3
4
5
FLIGHT PHASES INHIBITION
INHIBITED PHASE

Effect on E/WD :

(a) The failure occurs during Phase 1. The E/WD immediately displays the warning and continues to display it as long as the failure is present, even in Phase 2.

(b) The failure occurs during Phase 2. The E/WD only displays the warning once the aircraft has entered Phase 3, where it is not inhibited. Then, the warning remains displayed as long as the failure is present.

MEMO

Ident.: DSC-31-15-A-00000505.0001001 / 21 MAR 16
Applicable to: ALL

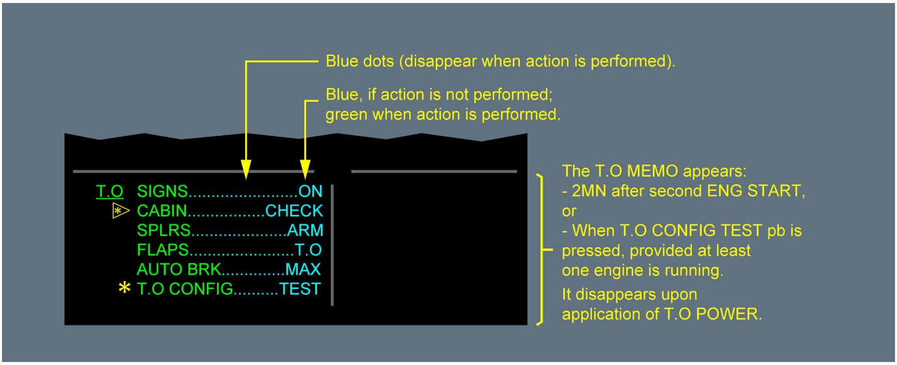
MEMO DISPLAY

Memos appear in the lower part of the E/WD.
They are normally in green. But, in abnormal situations, they may be amber.
Memos list functions or systems that are temporarily used in normal operations.

Ident.: DSC-31-15-A-00000523.0001001 / 04 JUN 19
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

T.O. AND LDG MEMOS

During the takeoff and landing phases, the right-hand side of the memo area displays specific T.O. INHIBIT or LDG INHIBIT memos.
Takeoff and landing memos are displayed, as follows, during the related flight phases :


T.O
SIGNS........................ON
CABIN.................CHECK
SPLRS.....................ARM
FLAPS.......................T.O
AUTO BRK..............MAX
* T.O CONFIG..........TEST

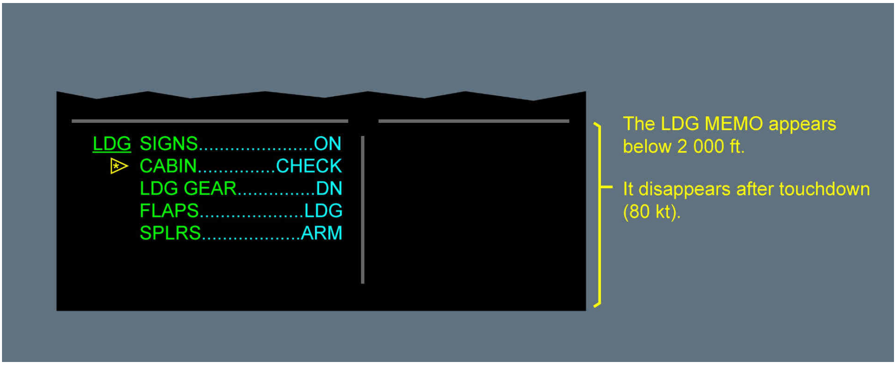
Blue dots (disappear when action is performed).

Blue, if action is not performed; green when action is performed.

The T.O MEMO appears:
- 2MN after second ENG START, or
- When T.O CONFIG TEST pb is pressed, provided at least one engine is running.

It disappears upon application of T.O POWER.

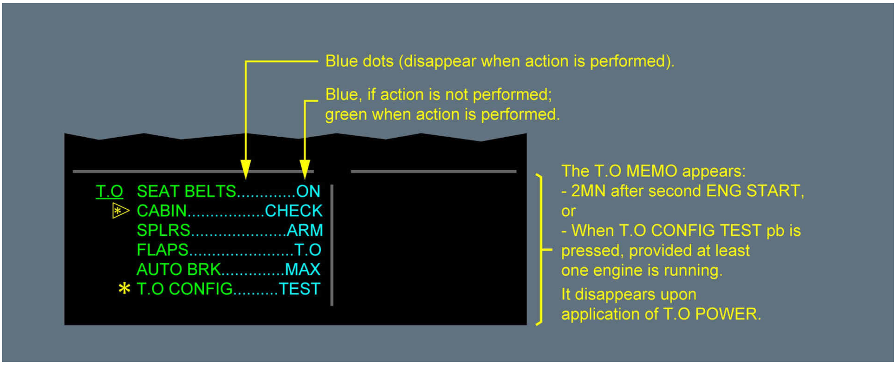
Note: ** This line disappears, when the test is completed. It is replaced by "T.O. CONFIG NORMAL", if the aircraft configuration is correct.*
The test is requested again, if the configuration becomes abnormal.


LDG SIGNS.....................ON
CABIN...............CHECK
LDG GEAR...............DN
FLAPS...................LDG
SPLRS..................ARM
The LDG MEMO appears below 2 000 ft.
It disappears after touchdown (80 kt).

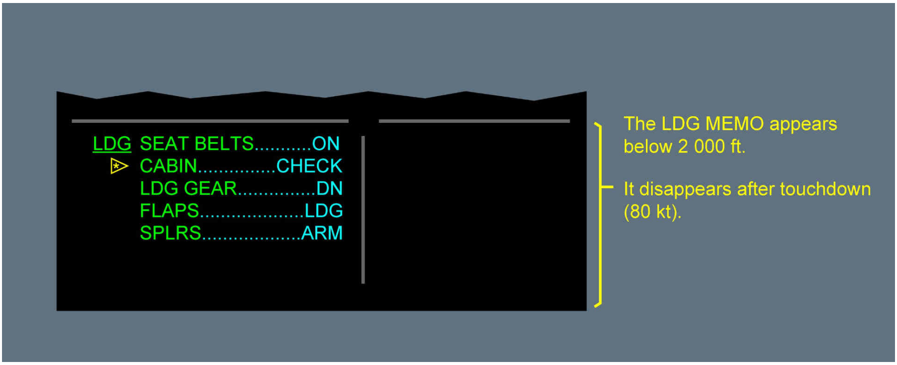
Ident.: DSC-31-15-A-00000523.0006001 / 04 JUN 19
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

T.O. AND LDG MEMOS

During the takeoff and landing phases, the right-hand side of the memo area displays specific T.O. INHIBIT or LDG INHIBIT memos.
Takeoff and landing memos are displayed, as follows, during the related flight phases:


Blue dots (disappear when action is performed).
Blue, if action is not performed;
green when action is performed.
T.O SEAT BELTS.............ON
CABIN.................CHECK
SPLRS.....................ARM
FLAPS.......................T.O
AUTO BRK..............MAX
* T.O CONFIG..........TEST
The T.O MEMO appears:
- 2MN after second ENG START,
or
- When T.O CONFIG TEST pb is pressed, provided at least one engine is running.
It disappears upon application of T.O POWER.

Note: ** This line disappears, when the test is completed. It is replaced by "T.O CONFIG NORMAL", if the aircraft configuration is correct.*
The test is requested again, if the configuration becomes abnormal.


LDG
SEAT BELTS...........ON
CABIN...............CHECK
LDG GEAR...............DN
FLAPS....................LDG
SPLRS...................ARM

The LDG MEMO appears below 2 000 ft.

It disappears after touchdown (80 kt).

CONFIGURATION WARNINGS

Ident.: DSC-31-15-00000528.0034001 / 05 MAR 19

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The following warnings and cautions appear in the lower part of the E/WD if the aircraft is not in takeoff configuration when the flight crew presses the T.O. CONFIG pb on the ECAM control panel or applies takeoff power.

WARNINGS / CAUTIONS	T.O. CONFIG TEST	T.O. POWER
CONFIG RUD TRIM NOT IN T.O RANGE (1)	TRIGGERED	TRIGGERED
CONFIG PITCH TRIM NOT IN T.O RANGE (1)		
F/CTL PITCH TRIM/MCDU/CG DISAGREE (2)		
CONFIG FLAPS NOT IN T.O CONFIG (1)		
F/CTL FLAP/MCDU DISAGREE (2)		
T.O SPEEDS TOO LOW (2)		
T.O V1/VR/V2 DISAGREE (2)		
T.O SPEEDS NOT INSERTED (2)		
CONFIG SPD BRK NOT RETRACTED (1)		
CONFIG SLATS NOT IN T.O CONFIG (1)		
CONFIG L SIDESTICK FAULT (BY TAKE OVER) (1)		
CONFIG R SIDESTICK FAULT (BY TAKE OVER) (1)		
DOOR (2)		
BRAKES HOT (2)		
FUEL L(R) WING PUMPS LO PR (2)		
ELEC IDG 1(2) DISCONNECTED (2)		
ELEC GEN 1(2) FAULT (2)		
ELEC GEN 1(2) OFF (2)		
ENG 1 OIL LO TEMP (2)		
ENG 2 OIL LO TEMP (2)		
HYD G(B)(Y) SYS LO PR (2)		
CONFIG PARK BRK ON (1)	NOT TRIGGERED	
ENG THR LEVERS NOT SET (2)		

(1) *(R) Red warning*

(2) *(A) Amber caution*

CONFIGURATION WARNINGS

Ident.: DSC-31-15-00000528.0021001 / 06 SEP 16
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

The following warnings and cautions appear in the lower part of the E/WD if the aircraft is not in takeoff configuration when the flight crew presses the T.O. CONFIG pb on the ECAM control panel or applies takeoff power.

WARNINGS / CAUTIONS	T.O. CONFIG TEST	T.O. POWER
CONFIG RUD TRIM NOT IN T.O RANGE (1)	TRIGGERED	TRIGGERED
CONFIG PITCH TRIM NOT IN T.O RANGE (1)		
F/CTL PITCH TRIM/MCDU/CG DISAGREE (2)		
CONFIG FLAPS NOT IN T.O CONFIG (1)		
F/CTL FLAP/MCDU DISAGREE (2)		
CONFIG SPD BRK NOT RETRACTED (1)		
CONFIG SLATS NOT IN T.O CONFIG (1)		
CONFIG L SIDESTICK FAULT (BY TAKE OVER) (1)		
CONFIG R SIDESTICK FAULT (BY TAKE OVER) (1)		
DOOR (2)		
BRAKES HOT (2)		
FUEL L(R) WING PUMPS LO PR (2)		
ELEC IDG 1(2) DISCONNECTED (2)		
ELEC GEN 1(2) FAULT (2)		
ELEC GEN 1(2) OFF (2)		
ENG 1 OIL LO TEMP (2)		
ENG 2 OIL LO TEMP (2)		
HYD G(B)(Y) SYS LO PR (2)		
CONFIG PARK BRK ON (1)	NOT TRIGGERED	
ENG THR LEVERS NOT SET (2)		

(1) *(R) Red warning*

(2) *(A) Amber caution*

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GENERAL

Ident.: DSC-31-20-00000538.0001001 / 21 MAR 16
Applicable to: ALL

The system/status Display (SD) uses the lower ECAM DU to display :
- either an aircraft system synoptic diagram page
- or the STATUS page.

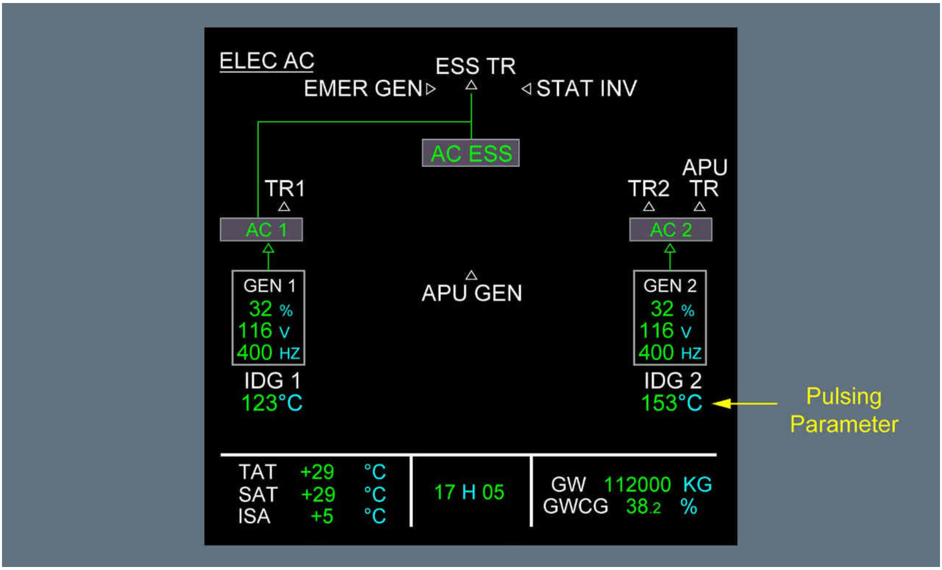
SYSTEM PAGES

Ident.: DSC-31-20-00000539.0005001 / 10 MAY 21
Applicable to: ALL

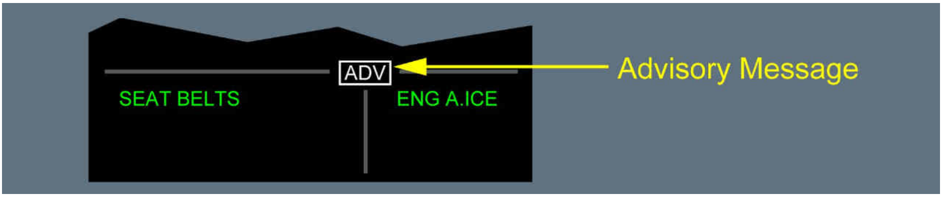
The lower ECAM DU can display 14 system pages (for description see relevant FCOM chapter):
- ENGINE (Secondary engine parameters)
- BLEED (Air bleed)
- CAB PRESS (Cabin pressurization)
- ELEC AC (AC Electrical power)
- ELEC DC (DC Electrical power)
- HYD (Hydraulic)
- C/B (Circuit Breakers)
- APU (Auxiliary Power Unit)
- COND (Air conditioning)
- DOOR/OXY (Doors/oxygen)
- WHEEL (Landing Gear, Braking, ground spoilers, etc.)
- F/CTL (Flight Controls)
- FUEL (Fuel)
- CRUISE (Cruise).

The flight crew may manually call up a system page for display on the lower ECAM DU, or the system may automatically display a page.
- Manually:
  - The flight crew can use the pushbutton on the ECAM control panel to call up any system page, except the CRUISE page, for display at any time
  - The corresponding pushbutton on the ECAM control panel lights up
  - A failure-related display automatically replaces a page the flight crew has manually called up.
- Automatically, related to a failure:
  - The relevant system page automatically appears, as soon as any fault or malfunction triggers a caution or warning message.

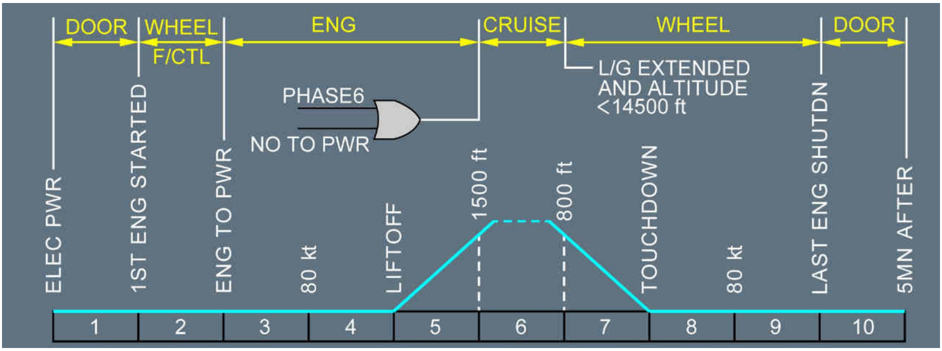
- Automatically, related to an advisory:
  - The relevant system page automatically appears, when a parameter drifts out of its normal range
  - The value (shown in green) pulses, as long as it is outside its limits
  - The advisory mode is inhibited in some flight phases.


ELEC AC
ESS TR
EMER GEN
STAT INV
AC ESS
TR1
TR2
APU TR
AC 1
AC 2
APU GEN
GEN 1
32 %
116 V
400 HZ
IDG 1
123°C
GEN 2
32 %
116 V
400 HZ
IDG 2
153°C
Pulsing Parameter
TAT +29 °C
SAT +29 °C
ISA +5 °C
17 H 05
GW 112000 KG
GWCG 38.2 %

Note: *If an advisory is triggered when the ECAM is in the single-display configuration, an advisory message appears on the upper part of the E/WD, and the associated key on ECAM control panel flashes to identify the appropriate system page.*

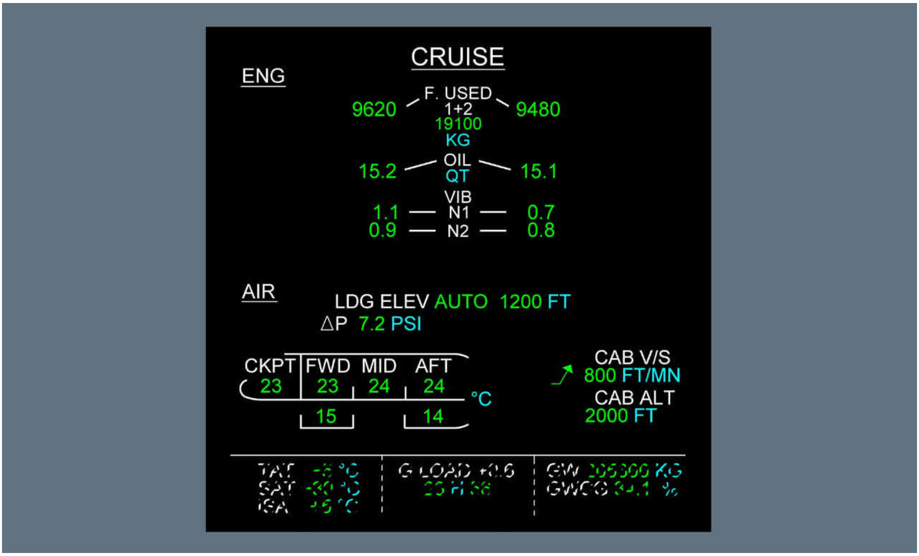

ADV
Advisory Message
SEAT BELTS
ENG A.ICE

- Automatically, related to flight phase mode:
  - If no other mode is engaged, the SD displays the system page related to the present flight phase, as shown in the following diagram.


DOOR
WHEEL
F/CTL
ENG
CRUISE
WHEEL
DOOR
L/G EXTENDED AND ALTITUDE <14500 ft
PHASE6
NO TO PWR
ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

- Phase 2: The F/CTL SD page replaces the WHEEL SD page for 20 s, when either flight crew moves the sidestick (more than 3 ° in pitch or roll), or when the rudder pedal deflection is more than 22 °
- The APU SD page appears, when the APU MASTER SW pb-swis ON. It disappears when APU RPM has been above 95 % for 10 s, or when the APU MASTER SW pb-sw switch is switched OFF
- The ENGINE SD page appears at the beginning of the start sequence, or when a flight crew selects CRANK. It disappears at the end of the start sequence.

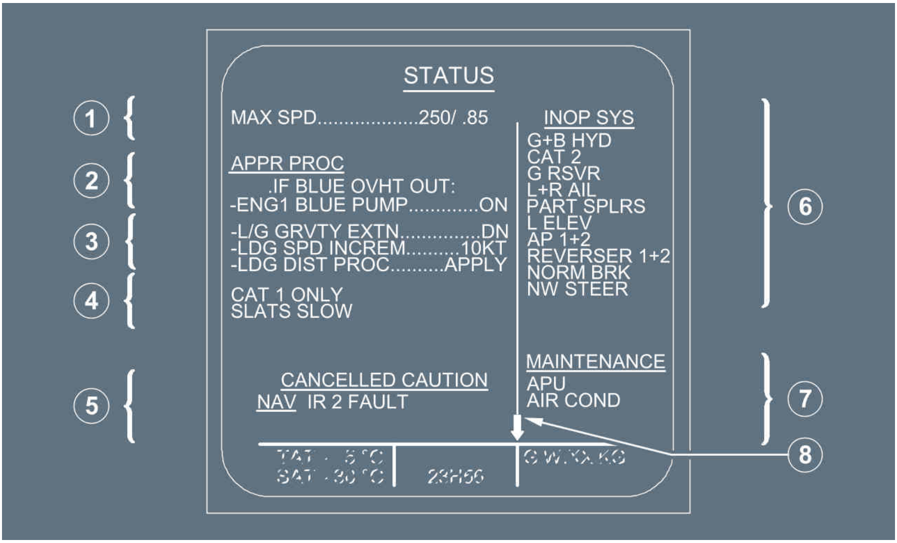
For a description of the ENGINE and AIR indications that appear, when the SD is displaying the CRUISE page, see the relevant FCOM chapter.


CRUISE
ENG
9620
F. USED
1+2
19100
KG
9480
15.2
OIL
QT
15.1
VIB
1.1
N1
0.7
0.9
N2
0.8
AIR
LDG ELEV AUTO 1200 FT
ΔP 7.2 PSI
CKPT
FWD
MID
AFT
23
23
24
24
°C
15
14
CAB V/S
800 FT/MN
CAB ALT
2000 FT
TAT -5 °C
SAT -30 °C
ISA +5 °C
G LOAD +0.5
23 H 56
GW 205300 KG
GWCG 34.1 %

STATUS PAGE

Ident.: DSC-31-20-00000548.0001001 / 12 APR 16
Applicable to: ALL

PURPOSE


STATUS
MAX SPD...................250/ .85
APPR PROC
.IF BLUE OVHT OUT:
-ENG1 BLUE PUMP.............ON
-L/G GRVTY EXTN...............DN
-LDG SPD INCREM..........10KT
-LDG DIST PROC..........APPLY
CAT 1 ONLY
SLATS SLOW
CANCELLED CAUTION
NAV IR 2 FAULT
INOP SYS
G+B HYD
CAT 2
G RSVR
L+R AIL
PART SPLRS
L ELEV
AP 1+2
REVERSER 1+2
NORM BRK
NW STEER
MAINTENANCE
APU
AIR COND
TAT + 5 °C
SAT -30 °C
23H56
G.W. XX KG
1
2
3
4
5
6
7
8

The STATUS page provides an operational summary of the state of the aircraft. As illustrated in the following image, this operational summary includes all of the following:

(1) Limitations (speed, flight level): Blue

(2) Approach procedures: White

(3) Procedures (corrections to apply for landing): Blue

(4) Information: Green

(5) Cancelled caution: White

(6) Inoperative system: Amber

(7) Maintenance status: White

(8) The arrow appears if the data on the STATUS page overflows the left or right area of the page.

The flight crew can press the CLR pb, in order to scroll the display to view the overflow.

Note: The titles of the different parts of the display appear in white and underlined.

STATUS PAGE DISPLAY

The STATUS page appears when the flight crew presses the STS pb on the ECAM Control Panel (ECP).

The STATUS page automatically appears in abnormal operations if one of the following applies:
- The STATUS page is not empty, and the flight crew clears the last alert on the E/WD, or
- The STATUS page is not empty, and the flight crew selects CONF1 for approach, or
- The STATUS page is not empty, and the flight crew sets QNH/QFE on the EFIS Control Panel during descent.

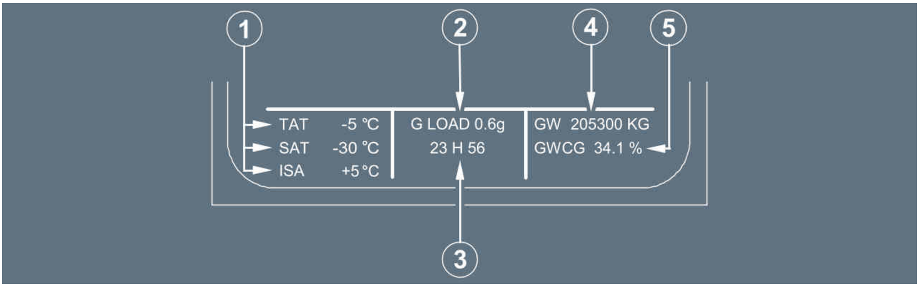
STS REMINDER

The STS reminder appears on the E/WD if both the following conditions apply:
- The STATUS page is not empty: The STATUS page displays message other than “CANCELLED CAUTION” or MAINTENANCE status.
- There is a MAINTENANCE status at engines shutdown.

The MAINTENANCE status can appear only when the aircraft is on the ground, before engine start or after engine shutdown.

PERMANENT DATA

Ident.: DSC-31-20-00017830.0004001 / 25 JUL 16
Applicable to: ALL



(1) Temperature
The screen displays Total Air Temperature (TAT), Static Air Temperature (SAT) in green. The difference between the SAT and the International Standard Atmosphere (ISA) temperature (Delta ISA ◁) is displayed in green, in STD BARO reference mode only.

(2) Messages - G LOAD

The screen displays either one of the following two items, one at a time:
- Load factor (G LOAD) in amber, when the value is above 1.4 g or below 0.7 g for more than 2 s.
  The G LOAD amber indication remains displayed 5 s after the excessive load occurrence.
  This display is inhibited during flight phases 1, 2, 3, 9 and 10.
- “CHECK SD”, “CHECK CAPT (F/O) PFD” or “CHECK CAPT (F/O) ND”, all in amber (*Refer to DSC-31-05-20 Cockpit Arrangement*).

Note: *The display of the feedback messages takes priority over the load factor indication.*

(3) UTC

The screen displays Universal Time Coordinated (UTC), synchronized with the cockpit clock, in green.

Note: *“40H00” default value is displayed in the case of cockpit clock failure at Central Maintenance Computer (CMC) power-up.*

(4) GW

The screen displays the gross weight (GW) as given by the FCMC, in green. The two last digits are dashed if accuracy is degraded. On ground, the indication is replaced by blue dashes, if no computed data are available.

(5) GWCG

The screen displays the gross weight center of gravity (GWCG), as given by the FCMC, in green. In case of an EXCESS AFT CG warning, the indication appears in red.

AMBER CROSSES "XX" ON THE SD

Ident.: DSC-31-20-00017856.0001001 / 21 MAR 16
Applicable to: ALL

If a parameter value on any SD page is not available for display, amber crosses "XX" appear instead of the value.

AMBER DASHES ON THE SD

Ident.: DSC-31-20-00015259.0001001 / 01 APR 14
Applicable to: ALL

If the accuracy of a parameter value on any SD page is degraded, amber dashes are displayed over the last digits.

Intentionally left blank

GENERAL

Ident.: DSC-31-25-10-00000567.0001001 / 21 MAR 16
Applicable to: ALL

If ECAM detects a failure :
- The E/WD displays warning or caution messages.
- The master warning or master caution lights light up (except in the case of a level 1 caution).
- The system sounds an aural signal (except in the case of a level 1 caution).
- The system display (SD) shows the system page for the affected system.
- The CLR pushbutton on the ECAM control panel lights up.

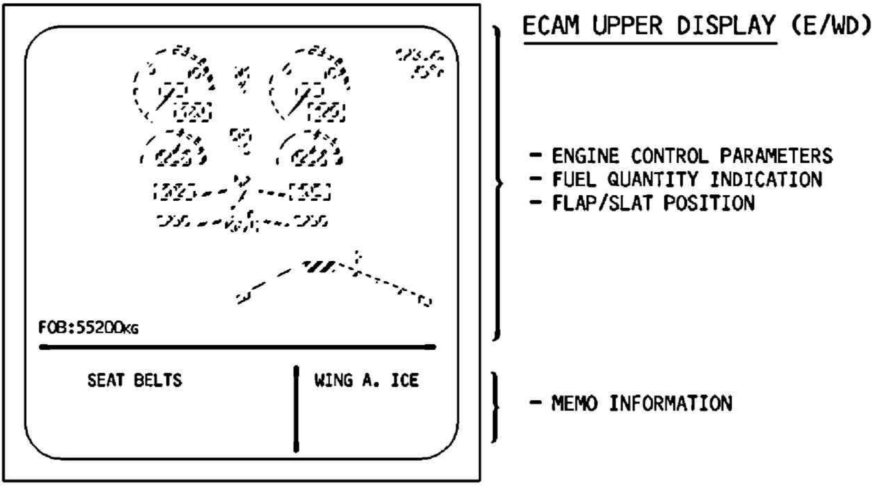
In addition, a local warning light controlled directly by the affected system can light up.

After completing remedial procedures, the flight crew must push the CLR pushbutton repeatedly until the displays return to their normal configurations :
- MEMO messages on the E/WD
- The system page related to the present flight phase on the SD.
- The CLR light on the ECAM control panel turned off.

Intentionally left blank

1 - THE ECAM DETECTS NO FAILURE

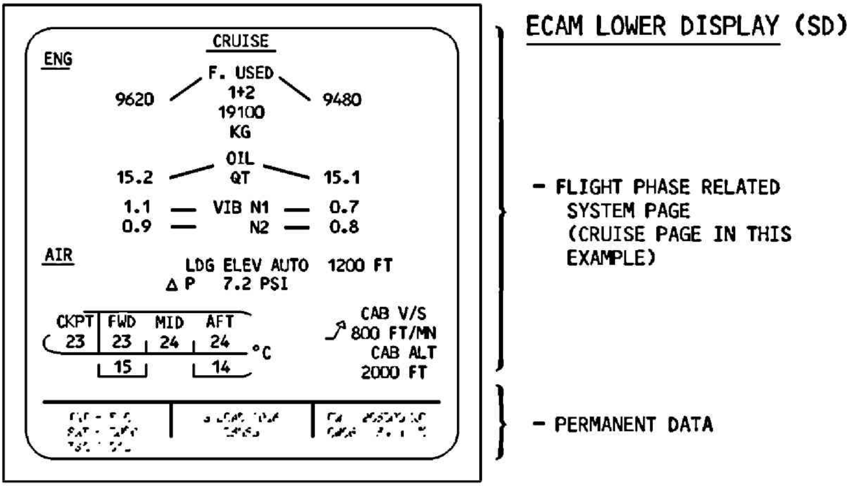
Ident.: DSC-31-25-20-00000569.0007001 / 21 MAR 16
Applicable to: ALL


FOB:55200KG
SEAT BELTS
WING A. ICE

ECAM UPPER DISPLAY (E/WD)

- ENGINE CONTROL PARAMETERS
- FUEL QUANTITY INDICATION
- FLAP/SLAT POSITION

- MEMO INFORMATION


CRUISE
ENG
F. USED
1+2
19100
KG
9620
9480
OIL
QT
15.2
15.1
1.1
VIB N1
0.7
0.9
N2
0.8
AIR
LDG ELEV AUTO
1200 FT
Δ P
7.2 PSI
CKPT
FWD
MID
AFT
23
23
24
24
°C
15
14
CAB V/S
800 FT/MN
CAB ALT
2000 FT

ECAM LOWER DISPLAY (SD)

- FLIGHT PHASE RELATED SYSTEM PAGE (CRUISE PAGE IN THIS EXAMPLE)

- PERMANENT DATA

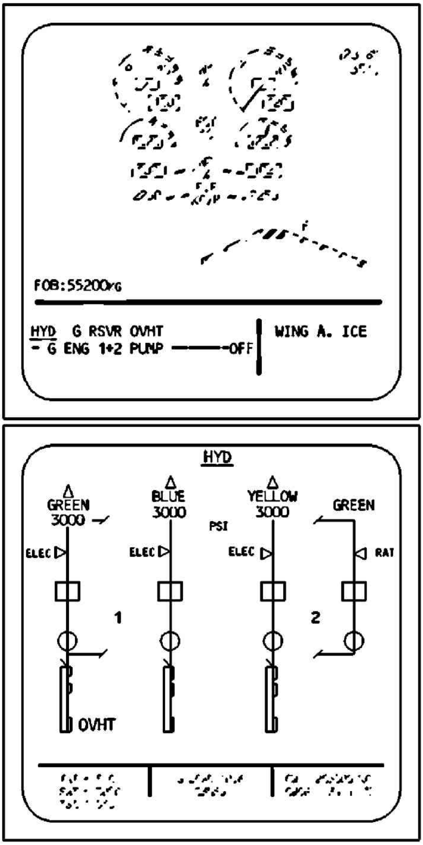
2 - THE ECAM DETECTS A FAILURE

Ident.: DSC-31-25-20-00000570.0005001 / 21 MAR 16
Applicable to: ALL

For example, a hydraulic reservoir is overheating.

COCKPIT INDICATIONS

- A single chime sounds.
- Both MASTER CAUTION lights come on, and stay on.
- A FAULT light on the overhead HYD panel comes on.
- The memo space on the E/WD displays the “HYD G RSVR OVHT” message and the “G ENG 1 + 2 PUMP . . . . . OFF” instruction.
- The lower ECAM display (SD) automatically calls up the hydraulic system’s diagram and displays “OVHT” in amber next to the green system.
- The CLR pushbutton, on the ECAM control panel, lights up.


FOB:55200KG
HYD G RSVR OVHT
- G ENG 1+2 PUMP ——OFF
WING A. ICE
HYD
GREEN
3000
BLUE
3000
YELLOW
3000
PSI
GREEN
ELEC
ELEC
ELEC
RAT
1
2
OVHT

ECAM UPPER DISPLAY (E/WD)

- LEFT PART
  - INDEPENDENT FAILURE
    - TITLE OF THE FAILURE
    - ACTIONS TO BE PERFORMED
- RIGHT PART
  - MEMO INFORMATION

ECAM LOWER DISPLAY (SD)

- SYNOPTIC OF THE AFFECTED SYSTEM AUTOMATICALLY CALLED OVHT IS DISPLAYED IN AMBER

3 - THE FLIGHT CREW FOLLOWS THE INSTRUCTION DISPLAYED ON THE E/WD

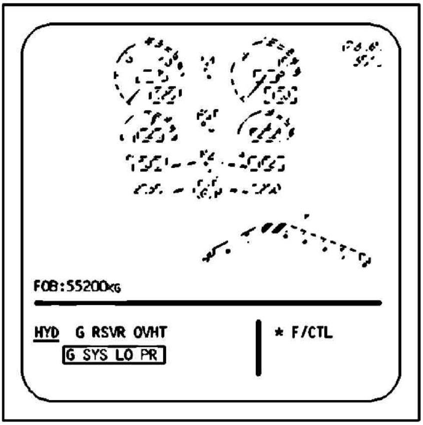
Ident.: DSC-31-25-20-00000573.0005001 / 21 MAR 16
Applicable to: ALL

The crew switches off the green ENG 1 and 2 pump, depressurizing the green hydraulic circuit.

COCKPIT INDICATIONS

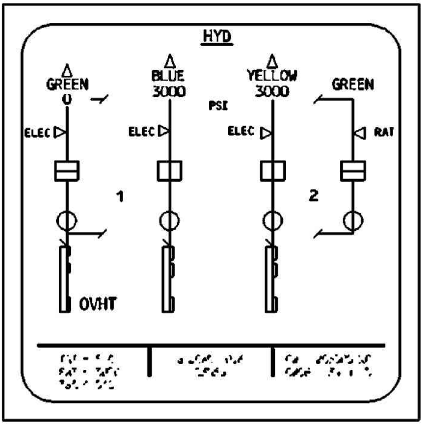
- A single chime sounds.
- Both MASTER CAUTION lights stay on.
- A FAULT/OFF light on the overhead panel comes on.
- The second part of the message on the E/WD changes to “G SYS LO PR”.

- The system diagram on the SD displays an amber zero for the pressure in the green system, along with the amber “OVHT”.
- The right side of the memo area indicates a secondary failure in the flight control system.
- The CLR pushbutton, on the ECAM control panel, remains lit.


FOB:55200KG
HYD G RSVR OVHT
G SYS LO PR
* F/CTL

ECAM UPPER DISPLAY (E/WD)

- LEFT PART
  - INDEPENDENT FAILURE AND PRIMARY FAILURE
- RIGHT PART
  - SECONDARY FAILURE


HYD
GREEN
0
BLUE
3000
YELLOW
3000
GREEN
PSI
ELEC
ELEC
ELEC
RAT
1
2
OVHT

ECAM LOWER DISPLAY (SD)

- THE SYNOPTIC OF THE SYSTEM PAGE IS CHANGED ACCORDING TO THE NEW SYSTEM CONFIGURATION.
  OVHT AND THE PRESSURE ARE DISPLAYED IN AMBER

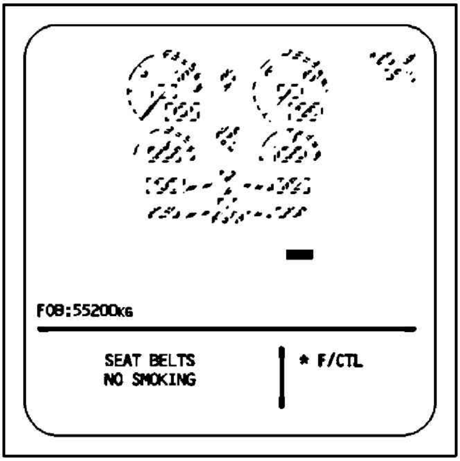
4 - ONE OF THE PILOTS PUSHES THE CLR PUSHBUTTON ON THE ECP

Ident.: DSC-31-25-20-00000578.0003001 / 21 MAR 16
Applicable to: ALL

COCKPIT INDICATIONS

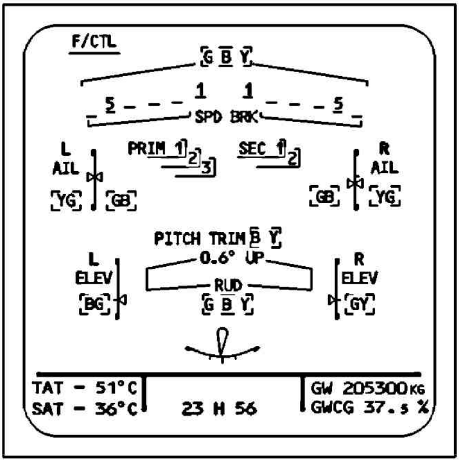
- The CLR pushbutton stays lit.
- The FAULT/OFF light stays on.
- The hydraulic system messages disappear from the E/WD, and the right side of the memo area indicates a secondary failure in the flight control system.
- The SD automatically calls up the flight control system page, with surface actuator indications associated with the green hydraulic system shown in amber.

ECAM SEQUENCE - EXAMPLE


FOB:55200KG
SEAT BELTS
NO SMOKING
* F/CTL

ECAM UPPER DISPLAY (E/WD)

- LEFT PART
  - MEMO INFORMATION
- RIGHT PART
  - SECONDARY FAILURE


F/CTL
G B Y
1
1
5
5
SPD BRK
L
AIL
PRIM 1 2 3
SEC 1 2
R
AIL
YG
GB
GB
YG
PITCH TRIM B Y
0.6° UP
L
ELEV
R
ELEV
BG
RUD
G B Y
GY
TAT - 51°C
SAT - 36°C
23 H 56
GW 205300KG
GWCG 37.5 %

ECAM LOWER DISPLAY (SD)

- F/CTL SYSTEM PAGE AUTOMATICALLY DISPLAYED FAULTY SPOILERS (n° 1+5) AND SURFACE ACTUATOR PRESSURE INDICATION G ARE DISPLAYED IN AMBER

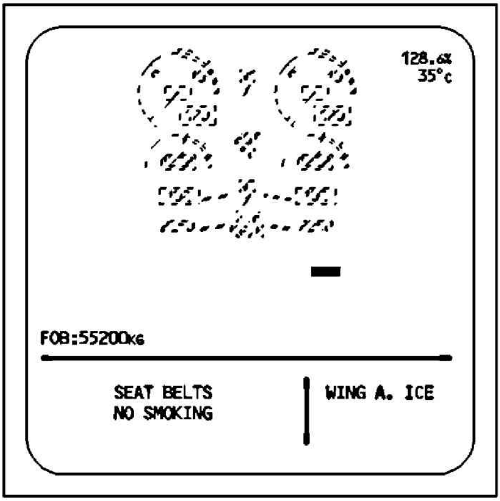
5 - ONE OF THE PILOTS PUSHES THE CLR PUSHBUTTON A SECOND TIME

Ident.: DSC-31-25-20-00000579.0008001 / 21 MAR 16
Applicable to: ALL

COCKPIT INDICATIONS

- The CLR and STS pushbuttons on the ECAM Control panel light up.
- The FAULT/OFF lights stay on.
- The memo area on the E/WD returns to normal.
- The STATUS page appears automatically on the SD, displaying the procedures for completing the flight with faulty green system.

ECAM UPPER DISPLAY (E/WD)



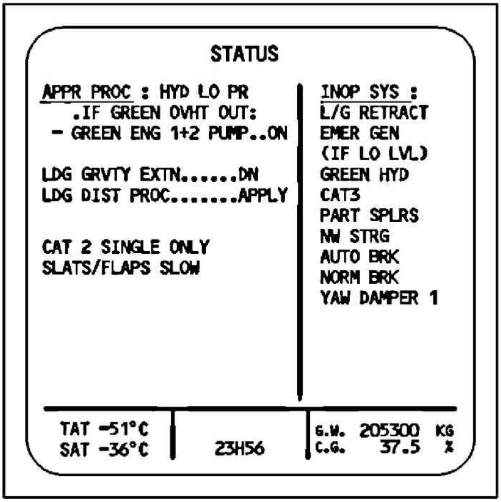
FOB:55200KG

SEAT BELTS
NO SMOKING

WING A. ICE

- FULL MEMO DISPLAYED

ECAM LOWER DISPLAY (SD)



STATUS

APPR PROC : HYD LO PR
.IF GREEN OVHT OUT:
- GREEN ENG 1+2 PUMP..ON

LDG GRVTY EXTN......DN
LDG DIST PROC.......APPLY

CAT 2 SINGLE ONLY
SLATS/FLAPS SLOW

INOP SYS :
L/G RETRACT
EMER GEN
(IF LO LVL)
GREEN HYD
CAT3
PART SPLRS
NW STRG
AUTO BRK
NORM BRK
YAW DAMPER 1

TAT -51°C
SAT -36°C

23H56

G.W. 205300 KG
C.G. 37.5 %

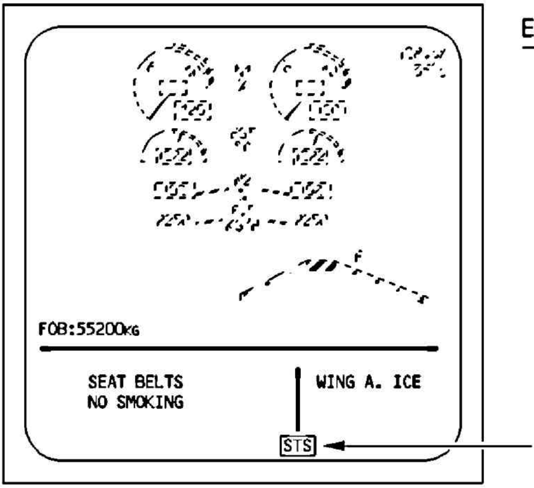
- THE STATUS PAGE IS AUTOMATICALLY DISPLAYED TO
  - PROVIDE THE PROCEDURE TO APPLY FOR APPROACH
  - LIST THE INOPERATIVE SYSTEMS

6 - ONE OF THE PILOTS PUSHES THE CLR PUSHBUTTON A THIRD TIME

Ident.: DSC-31-25-20-00000580.0017001 / 21 MAR 16
Applicable to: ALL

COCKPIT INDICATIONS

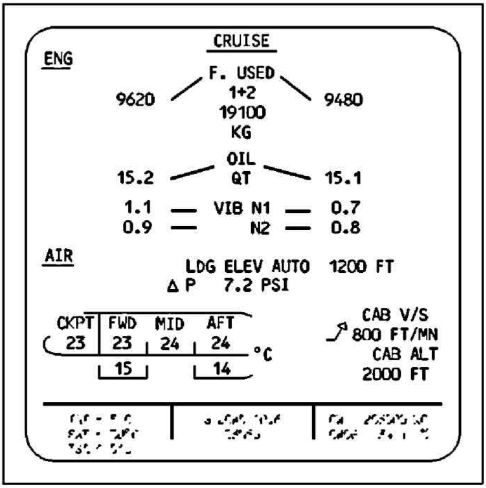
- The CLR pushbutton light goes off.
- The FAULT/OFF lights stay on.
- A status reminder appears at the bottom of the E/WD.
- The SD automatically calls up the system page for the flight phase.


FOB:55200KG
SEAT BELTS
NO SMOKING
WING A. ICE
STS

ECAM UPPER DISPLAY (E/WD)

- FULL MEMO DISPLAYED

STATUS REMINDER


CRUISE
ENG
F. USED
1+2
19100
KG
9620
9480
OIL
QT
15.2
15.1
1.1
VIB N1
0.7
0.9
N2
0.8
AIR
LDG ELEV AUTO 1200 FT
ΔP 7.2 PSI
CKPT
FWD
MID
AFT
23
23
24
24
°C
15
14
CAB V/S
800 FT/MN
CAB ALT
2000 FT

ECAM LOWER DISPLAY (SD)

- RETURN TO THE FLIGHT PHASE RELATED SYSTEM PAGE :
  CRUISE PAGE

GENERAL

Ident.: DSC-31-27-00000588.0001001 / 09 MAY 23
Applicable to: ALL

The OEB reminder function provides operational help to the flight crew. This function enables the flight crew to clearly identify on the ECAM any procedure and STATUS message superseded by an OEB procedure.
When a situation causes an ECAM alert to trigger, a message informs the flight crew in real time if there is an OEB for the displayed ECAM alert and/or STATUS messages. As a result, the ECAM procedure and/or STATUS message is changed. In this case, a specific ECAM message informs the flight crew to refer to the QRH.

Note: *OEB reminder function needs to be activated by an appropriate maintenance procedure.*

DESCRIPTION

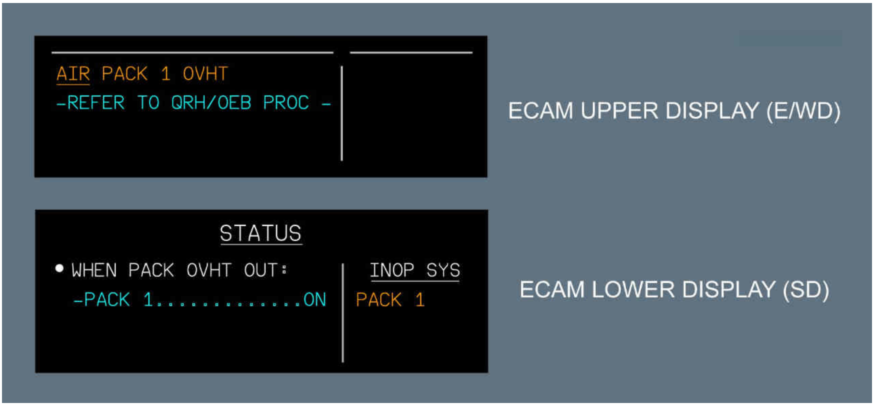
Ident.: DSC-31-27-00000589.0004001 / 09 NOV 20
Applicable to: ALL

The OEB reminder flag may apply to one of the following:
- ECAM procedure only
- ECAM procedure and corresponding status messages
- Status message only.

ONLY PROCEDURE AFFECTED

- The ECAM warning title remains the same
- All corresponding actions are deleted. Instead, the "REFER TO QRH/OEB PROC” message appears.
- The associated status messages on the ECAM system display remain the same.

COCKPIT INDICATION



```
AIR PACK 1 OVHT
-REFER TO QRH/OEB PROC -
```

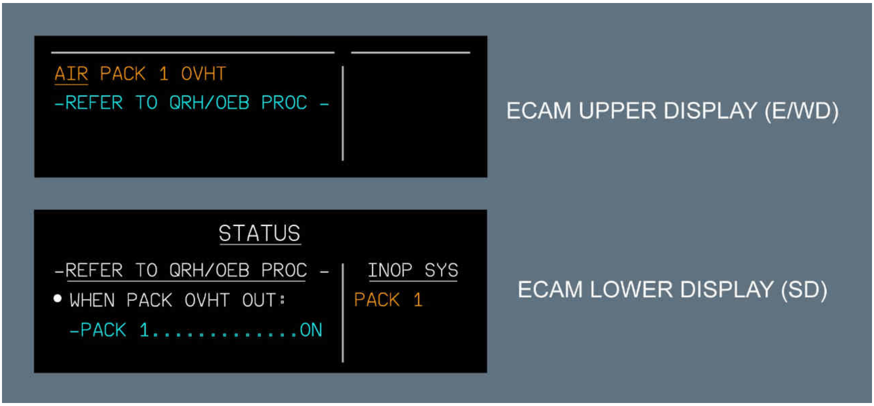
```
STATUS
• WHEN PACK OVHT OUT:          INOP SYS
  -PACK 1.............ON       PACK 1
```

ECAM UPPER DISPLAY (E/WD)
ECAM LOWER DISPLAY (SD)

PROCEDURE AND STATUS AFFECTED

- The ECAM warning title remains the same
- All corresponding actions are deleted. Instead, the “REFER TO QRH/OEB PROC message appears.
- The associated status messages on the ECAM system display remain the same, except for the additional “REFER TO QRH/OEB PROC” title.

COCKPIT INDICATION



```
AIR PACK 1 OVHT
-REFER TO QRH/OEB PROC -
```

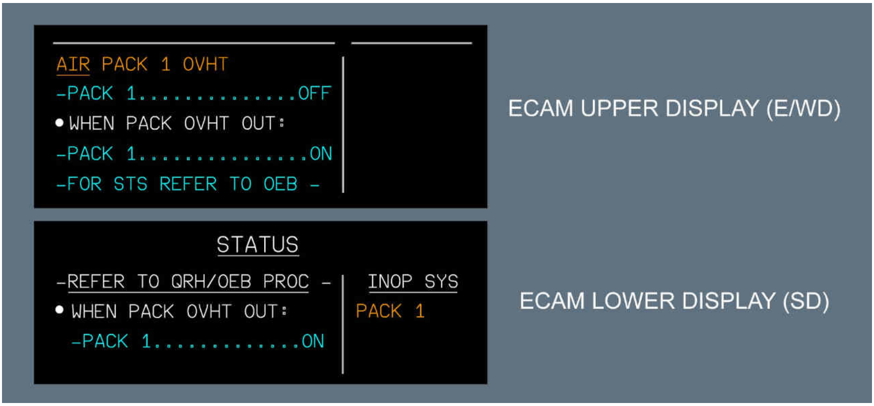
```
STATUS
-REFER TO QRH/OEB PROC -       INOP SYS
• WHEN PACK OVHT OUT:          PACK 1
  -PACK 1.............ON
```

ECAM UPPER DISPLAY (E/WD)
ECAM LOWER DISPLAY (SD)

ONLY STATUS MESSAGE AFFECTED

- The ECAM warning title remains the same
- The corresponding procedure remains the same, except for the additional “FOR STS REFER TO OEB” line
- The associated status messages on the ECAM system display remain the same, except for the additional “REFER TO QRH/OEB PROC” title.

COCKPIT INDICATION



AIR PACK 1 OVHT
-PACK 1..............OFF
● WHEN PACK OVHT OUT:
-PACK 1...............ON
-FOR STS REFER TO OEB -

STATUS
-REFER TO QRH/OEB PROC -
● WHEN PACK OVHT OUT:
-PACK 1.............ON

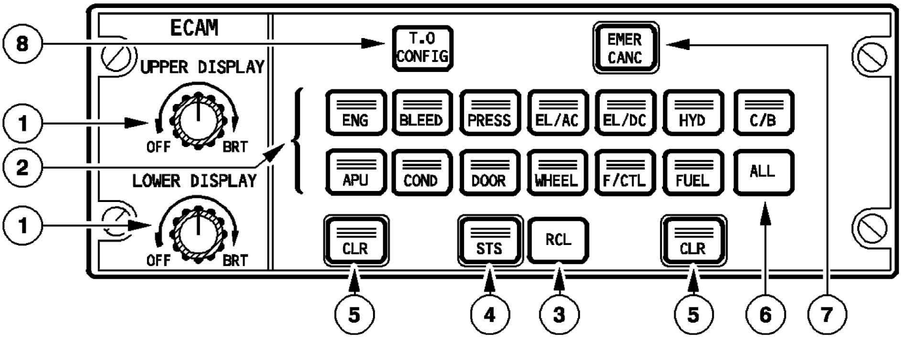
INOP SYS
PACK 1

Intentionally left blank

ECAM CONTROL PANEL

Ident.: DSC-31-30-00000591.0002001 / 03 NOV 21
Applicable to: ALL

ECP


ECAM
UPPER DISPLAY
OFF
BRT
LOWER DISPLAY
OFF
BRT
T.O CONFIG
EMER CANC
ENG
BLEED
PRESS
EL/AC
EL/DC
HYD
C/B
APU
COND
DOOR
WHEEL
F/CTL
FUEL
ALL
CLR
STS
RCL
CLR
8
1
2
1
5
4
3
5
6
7

(1) OFF / BRT knobs
Used to turn the ECAM DUs on and off, and to control their brightness (automatic adjustment of brightness for ambient light conditions is superimposed on this manual control).

Note: When the flight crew turns the UPPER DISPLAY knob to OFF, the engine/warning (E/W) display appears on the lower display unit (automatic transfer).

(2) System page pushbuttons

- Call up the corresponding system pages on the SD.
- Light up, when pushed for manual selection, or when an advisory is detected.
- Call up the aircraft system page corresponding to the present flight phase or the current warning when pushed a second time.

When only one ECAM display is on, the flight crew can display a system page for up to 3 min by holding the system page pushbutton.

- If an advisory condition arises, the relevant system page is not automatically displayed, but the pushbutton light pulses.
- If an ECAM warning is triggered, the relevant system page is not automatically displayed, and the system page pushbutton does not light up.

(3) RCL pushbutton

- When pressed, the E/WD displays all alerts previously cleared via the CLR pb that are still active.
- When pressed for more than 3 s, the E/WD displays:
  - All alerts previously cleared via the CLR pb that are still active
  - All alerts previously cancelled via the EMER CANC pb.

  Note: *This action on the RCL pb also suppresses the flight phase inhibition function until the next flight phase. As a consequence, all new alerts that should normally be inhibited will be displayed.*

Note: *If there is no alert to recall, the “NORMAL” message appears for 3 s on the E/WD.*

(4) STS (status) pushbutton

The flight crew pushes this pushbutton to display the STATUS page on the lower SD. The pushbutton remains lit, as long as the SD displays the STS page. If the system has no status messages, the status page displays “NORMAL” for 3 s.
The flight crew can clear the STATUS page by pushing the CLR pushbutton, or by pushing the STS pushbutton a second time.

When only one ECAM display is on :
- It displays the STATUS page only when the flight crew pushes the STATUS pushbutton and holds it. The flight crew can display the next STATUS page, if any, by releasing the pushbutton and pushing it again (before 2 s have elapsed). The new page then appears after a short delay.
- The flight crew can keep the STS pushbutton pressed to display the STATUS page for a maximum of 3 min, after which the ECAM automatically displays the engine/warning page.

(5) CLR pushbutton

This pushbutton remains lit as long as the E/WD is displaying a warning, or caution message or a status message on the SD.
If it is lit, pressing it changes the ECAM display.

(6) ALL pushbutton

When this pushbutton is pressed and held down, the SD successively displays all the system pages at 3 s intervals.
If the ECAM control panel fails, the flight crew can use this pushbutton to page through the system pages until the flight crew comes to the one the flight crew wants to look at. The flight crew releases the pushbutton then to select that page.

(7) EMER CANC pb

This pushbutton affects the following :

- Warnings :
  - Cancels (stops) an aural warning for as long as the failure condition continues.
  - Extinguishes the MASTER WARNINGS lights.
  - Does not affect the ECAM message display.
- Cautions :
  - Cancels any present caution (single chime, MASTER CAUTION lights, ECAM message) for the rest of the flight.

  The flight crew can press the RCL pb for more than 3 s in order to restore all the alerts previously canceled via the EMER CANC pb.
  All the alerts previously canceled via the EMER CANC pb automatically reappear on the E/WD in flight phase 1 or 2, immediately after the alignment of at least 2 IRs.

  Note: This pushbutton should only be used to suppress spurious MASTER CAUTIONS.

(8) TO CONFIG pb

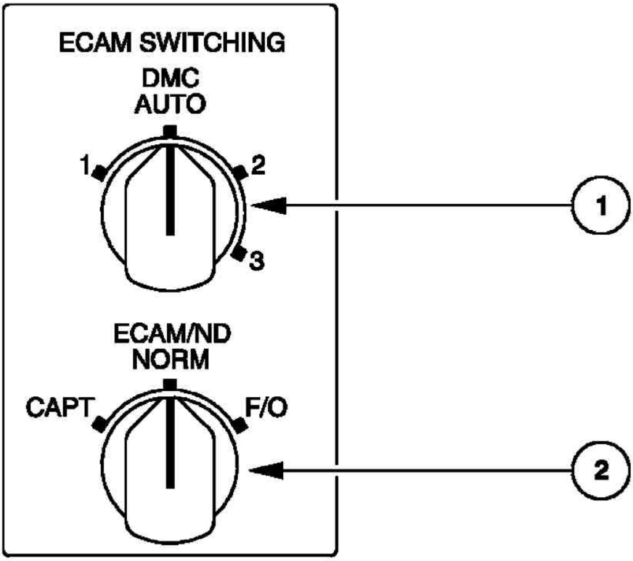
This pushbutton simulates the application of takeoff power. This is a test that triggers a warning, if the aircraft is not in takeoff configuration. (*Refer to DSC-31-15 Configuration Warnings*).
If the configuration is correct, the E/WD displays the “TO CONFIG NORMAL” message in the TO MEMO section.

Note: If the ECAM control panel fails, the CLR, RCL, STS, EMER CANC, and ALL pushbuttons remain operative, because their contacts are directly wired to the flight warning and display management computers.

ECAM SWITCHING PANEL

Ident.: DSC-31-30-00000601.0002001 / 07 FEB 11
Applicable to: ALL

ON MAIN INSTRUMENT PANEL



(1) Display Management Computer (DMC) selector switch

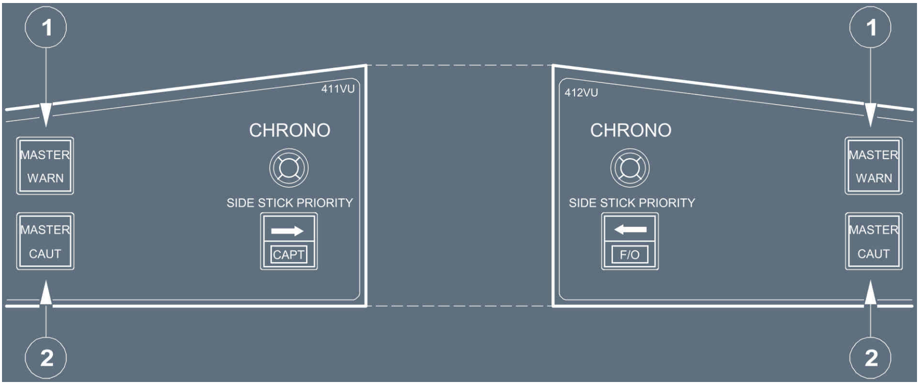
AUTO : DMC 3 supplies data to both ECAM DUs
In case of DMC 3 failure, the DMC 1 automatically takes over.
1 : DMC 1 replaces DMC 3
2 : DMC 2 replaces DMC 3
3 : DMC 3 supplies data to both ECAM DUs

(2) ECAM/ND transfer selector switch
Transfers the system/status display to either the captain's or the first officer's ND.
The "ECAM ON ND" is displayed on the lower ECAM display.

Note: If both ECAM DUs (E/WD and SD) fail, the flight crew can use this switch to transfer the E/W display to either navigation display.In this case the "ECAM ON ND" message is not displayed.

ATTENTION GETTERS

Ident.: DSC-31-30-00000600.0001001 / 21 MAR 16
Applicable to: ALL


1
1
411VU
412VU
CHRONO
CHRONO
MASTER WARN
MASTER WARN
SIDE STICK PRIORITY
SIDE STICK PRIORITY
MASTER CAUT
MASTER CAUT
CAPT
F/O
2
2

(1) MASTER WARN lights

- Flash red for level 3 warning.
- Accompanied by an aural warning (continuous repetitive chime, specific sounds or synthetic voice).

(2) MASTER CAUT lights

- Light up steady amber for a level 2 caution.
- Accompanied by a single chime.

These lights go out when :
- One pilot presses the light (except for some red warnings, such as the overspeed and stall warnings).
- The warning/caution situation is over.
- The pilot presses the CLR pushbutton on the ECAM control panel (except for some red warnings, such as the overspeed and stall warnings).
- The pilot presses the EMER CANC pushbutton on the ECAM control panel.

The aural warnings cease when :
- One pilot presses the MASTER WARN light (except for some red warnings, such as the overspeed and stall warnings).
- The warning situation is over.
- The pilot presses the EMER CANC pushbutton on the ECAM control panel.

MEMO DISPLAY

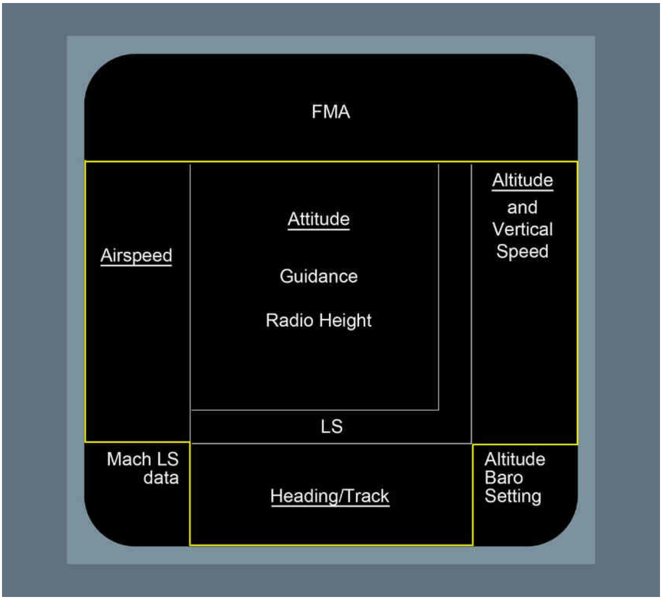
Ident.: DSC-31-30-00017074.0001001 / 21 MAR 16
Applicable to: ALL

ECAM SWTG :	This memo appears in green, when the ECAM SWITCHING DMC selector is not in the AUTO position.

GENERAL

Ident.: DSC-31-40-00000603.0002001 / 15 NOV 21
Applicable to: ALL

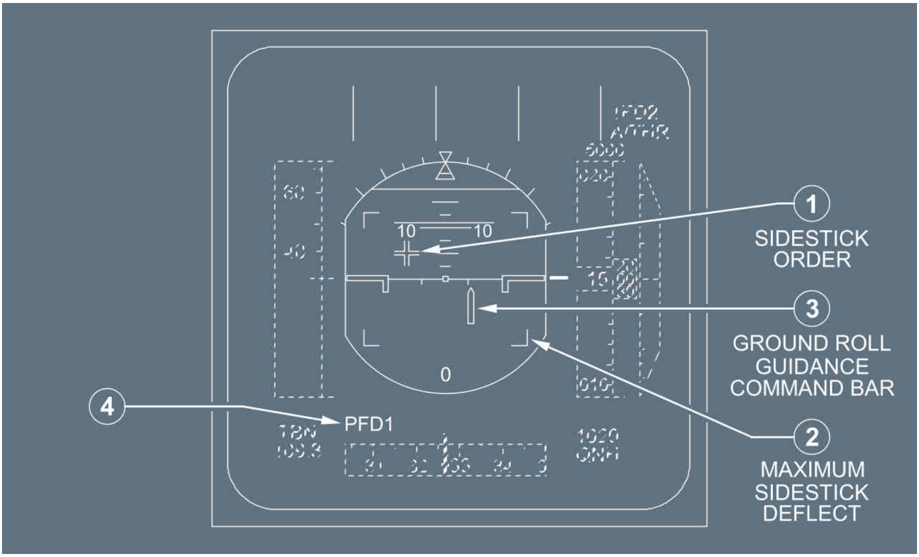
The Primary Flight Display (PFD) provides the following information to the flight crew:
- Attitude and Guidance
- Airspeed
- Baro altitude, radio height and vertical speed
- Heading and Track
- FMGES modes (Flight Mode Annunciator)
- Vertical and Lateral Deviations
- Radio navigation information (ILS, FLS ◁ , GLS ◁ , SLS ◁ , DME).


FMA
Airspeed
Attitude
Guidance
Radio Height
Altitude and Vertical Speed
LS
Mach LS data
Heading/Track
Altitude Baro Setting

The FWC monitors such main parameters as: Attitude, heading, and altitude. Also *Refer to DSC-31-40 Flags and Messages Displayed on PFD - Schematic*.

SPECIFIC GROUND INDICATIONS

Ident.: DSC-31-40-00000604.0001001 / 13 JAN 14
Applicable to: ALL


1FD2
A/THR
5000
020
60
40
10
10
15
0
010
1
SIDESTICK ORDER
3
GROUND ROLL GUIDANCE COMMAND BAR
2
MAXIMUM SIDESTICK DEFLECT
4
PFD1
TBN
109.3
1020
QNH
31
32
33
34

(1) Sidestick order indication (white)
This is displayed, as soon as one engine is started.
It indicates the total of the pilot's and copilot's sidestick orders (shown here as left wing down, pitch up).

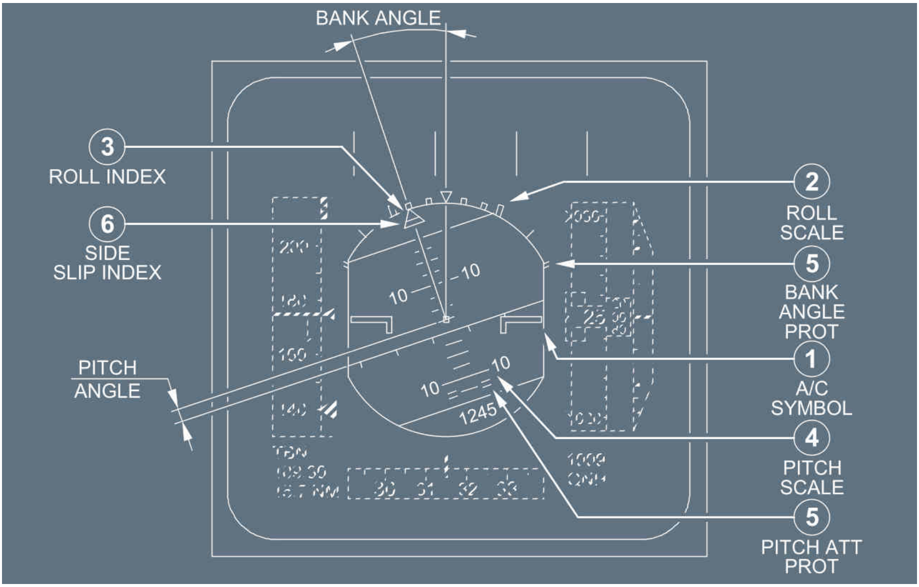
(2) Max Sidestick Deflection (white)
This is displayed, as soon as one engine is started.

(3) Ground Roll Guidance Command Bar (green)
This symbol is displayed when the aircraft is on the ground, or below 30 ft radio height, provided a localizer signal is available. It shows the flight director yaw orders, to keep the runway centerline.

(4) PFD 1 (2 or 3) message (magenta)
The display indicates which DMC drives the PFD. It appears only during tests on ground.

ATTITUDE DATA

Ident.: DSC-31-40-00000614.0006001 / 09 OCT 12
Applicable to: LV-KHT, LV-KHU


BANK ANGLE
3
ROLL INDEX
6
SIDE SLIP INDEX
PITCH ANGLE
2
ROLL SCALE
5
BANK ANGLE PROT
1
A/C SYMBOL
4
PITCH SCALE
5
PITCH ATT PROT
10
10
10
10
1245
200
180
160
140
25
1009
QNH
30
31
32
33

(1) Fixed Aircraft Symbol
This symbol is black, outlined in yellow.

(2) Roll Scale
This scale is white, and has markers at 0, 10, 20, 30, and 45 ° of bank.

(3) Roll Index (yellow)
This pointer indicates the bank angle. When the bank angle exceeds 45 °, all the PFD symbols except those for attitude, speed, heading, altitude, and vertical speed disappear. The display returns to normal when the bank angle decreases below 40 °.

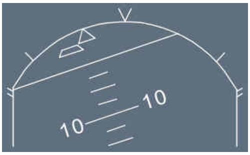
(4) Pitch Scale (white)
This scale has markers every ten degrees between 80 ° nose up and 80 ° nose down (every 2.5 ° between 10 ° nose down and 30 ° nose up). When pitch angle exceeds 25 ° nose up or 13 ° nose down, all the PFD displays except attitude, speed, speed trend, heading, altitude, and vertical speed disappear. Beyond 30 °, large red arrowheads indicate that the attitude has become excessive and show the direction to move the nose in order to reduce it. The display returns to normal when pitch angle becomes less than 22 ° nose up or 10 ° nose down.

(5) Flight Control Protection Symbols

The display shows these symbols (=) in green:
- On the roll scale to mark the bank angle protection availability
- On the pitch scale at 15 ° nose down or 30 ° nose up to mark the pitch limits.

An amber × replaces these symbols, if the corresponding protection is lost. (*Refer to DSC-27-20-20-30 Reconfiguration Control Laws - PFD Display*)

(6) Sideslip Index (yellow)
This trapezoidal index moves beneath the roll index. On ground, it represents the lateral acceleration of the aircraft. In flight, it shows sideslip (as computed by the PRIM computers). One centimeter of displacement indicates 0.2 g. The sideslip index is against its stop at 0.3 g.



In case of engine failure at take-off or go-around, the sideslip index changes from yellow to blue.

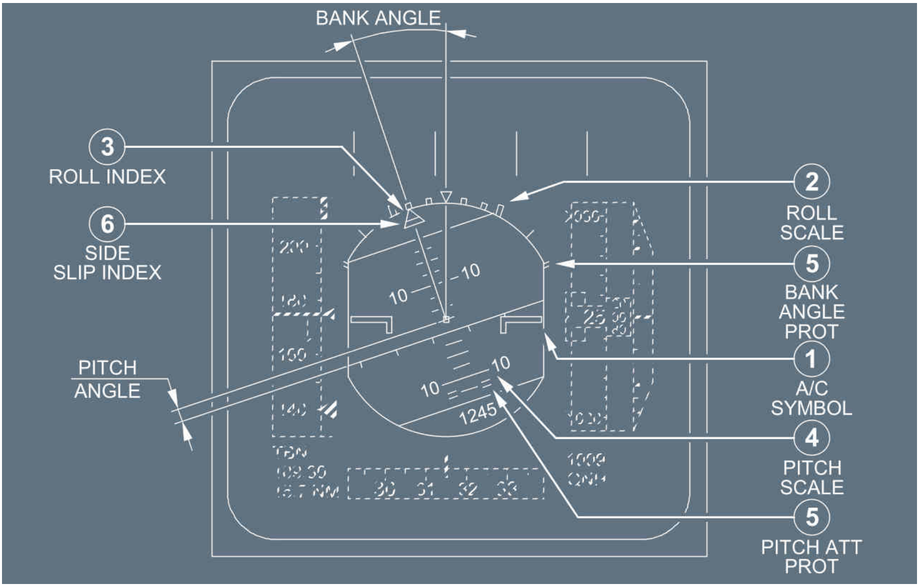
Note: *The sideslip target is blue if:*
- *Slats/Flaps are in CONF 1, 1+F, 2, 3 or FULL, and*
- *One thrust lever > MCT (≥ FLX if FLX or DERATED TO), and*
- *At least one engine > 1.3 EPR, and*
- *Engine thrust asymmetry > 0.25 EPR.*

In this case the sideslip index is called β target.

When this index is centered with the roll index, the sideslip equals the sideslip target for optimum aircraft performance.

ATTITUDE DATA

Ident.: DSC-31-40-00000614.0005001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


BANK ANGLE
3
ROLL INDEX
6
SIDE SLIP INDEX
PITCH ANGLE
2
ROLL SCALE
5
BANK ANGLE PROT
1
A/C SYMBOL
4
PITCH SCALE
5
PITCH ATT PROT
10
10
10
10
1245
200
180
160
140
TBN
109.30
15.7 NM
30
31
32
33
1009
QNH

(1) Fixed Aircraft Symbol
This symbol is black, outlined in yellow.

(2) Roll Scale
This scale is white, and has markers at 0, 10, 20, 30, and 45 ° of bank.

(3) Roll Index (yellow)
This pointer indicates the bank angle. When the bank angle exceeds 45 °, all the PFD symbols except those for attitude, speed, heading, altitude, and vertical speed disappear. The display returns to normal when the bank angle decreases below 40 °.

(4) Pitch Scale (white)
This scale has markers every ten degrees between 80 ° nose up and 80 ° nose down (every 2.5 ° between 10 ° nose down and 30 ° nose up). When pitch angle exceeds 25 ° nose up or 13 ° nose down, all the PFD displays except attitude, speed, speed trend, heading, altitude, and vertical speed disappear. Beyond 30 °, large red arrowheads indicate that the attitude has become excessive and show the direction to move the nose in order to reduce it. The display returns to normal when pitch angle becomes less than 22 ° nose up or 10 ° nose down.

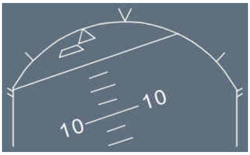
(5) Flight Control Protection Symbols

The display shows these symbols (=) in green :

- On the roll scale to mark the bank angle protection availability
- On the pitch scale at 15 ° nose down or 30 ° nose up to mark the pitch limits.

An amber × replaces these symbols if the corresponding protection is lost. (*Refer to DSC-27-20-20-30 Reconfiguration Control Laws - PFD Display*)

(6) Sideslip Index (yellow)
This trapezoidal index moves beneath the roll index. On ground, it represents the lateral acceleration of the aircraft. In flight, it shows sideslip (as computed by the PRIM computers). One centimeter of displacement indicates 0.2 g. The sideslip index is against its stop at 0.3 g.



In case of engine failure at take-off or go-around, the sideslip index changes from yellow to blue.

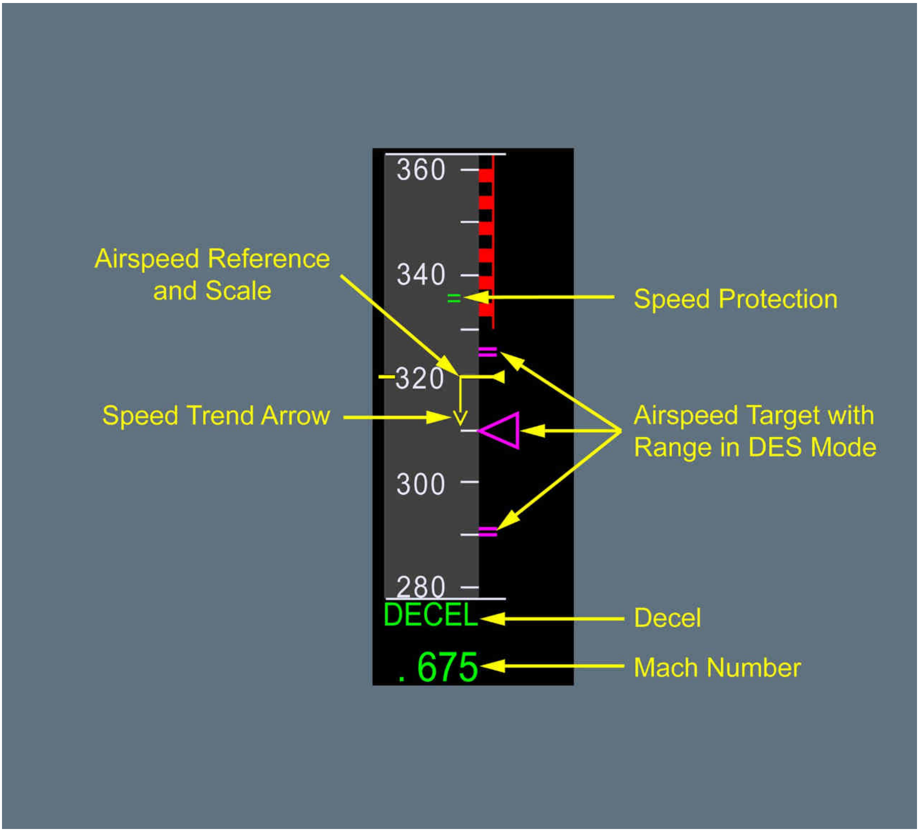
Note: *The sideslip target is blue if :*
- *Slats/Flaps are in CONF 1, 1+F, 2, 3 or FULL, and*
- *One thrust lever > MCT (≥ FLX if FLX or DERATED TO), and*
- *At least one engine > 80 % N1, and*
- *Engine thrust asymmetry > 30 % N1.*

In this case the sideslip index is called β target.

When this index is centered with the roll index, the sideslip equals the sideslip target for optimum aircraft performance.

AIRSPEED

Ident.: DSC-31-40-00000640.0006001 / 04 NOV 20
Applicable to: LV-GIF


360
340
320
300
280
DECEL
. 675
Airspeed Reference and Scale
Speed Protection
Speed Trend Arrow
Airspeed Target with Range in DES Mode
Decel
Mach Number

ACTUAL AIRSPEED REFERENCE LINE AND SCALE

A white scale on a gray background moves in front of a fixed yellow reference line next to a yellow triangle to show airspeed. The minimum airspeed indication is 30 kt.

SPEED TREND

This pointer starts at the speed symbol. The tip shows the speed the aircraft will reach in 10 s if its acceleration remains constant. The pointer appears only when it is greater than 2 kt and disappears when it is less than 1 kt.

It also disappears if the FMGECs fail.

AIRSPEED TARGET (MAGENTA OR BLUE)

This symbol gives the target airspeed or the airspeed corresponding to the target Mach number.
The target airspeed is the airspeed computed by FMGEC in managed speed mode (magenta) or entered manually on the FCU for selected speed mode (blue).
When the target speed is off the speed scale, its value is displayed as numbers below or above the speed scale.

MACH NUMBER

This is displayed when it is greater than 0.5.

SPEED PROTECTION

This symbol indicates the speed at which high speed protection becomes active. This symbol is not displayed in pitch alternate or direct law because the protection is not available. (*Refer to DSC-27-20-20-30 Reconfiguration Control Laws - PFD Display*)

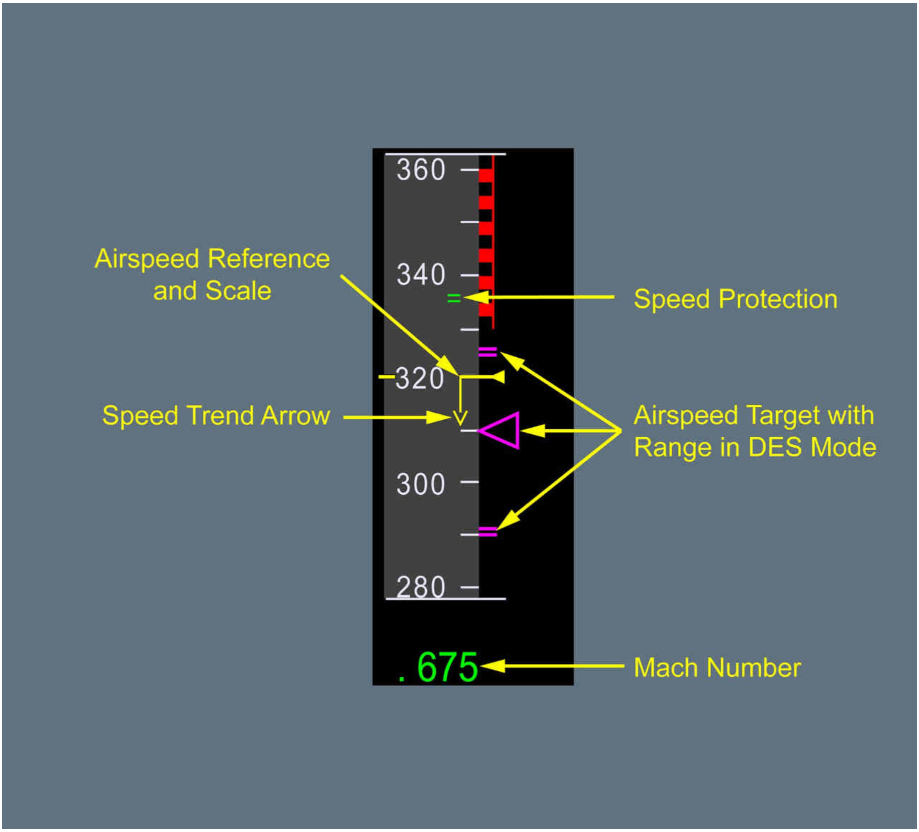
DECEL

The autobrake is active, and the aircraft decelerates as selected via the AUTO BRK mode selector.
This is displayed when the aircraft deceleration is at least 80 % of the selected deceleration. When the aircraft deceleration is less than 70 % of the selected deceleration, it disappears. The BSCU provides the DECEL information.

Note: *On a slippery runway, the A/SKID may be activated before the aircraft reaches 80 % of the deceleration. Therefore, the DECEL indication may not appear, even if the autobrake is active.*

AIRSPEED

Ident.: DSC-31-40-00000640.0002001 / 04 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU


360
340
320
300
280
. 675
Airspeed Reference and Scale
Speed Trend Arrow
Speed Protection
Airspeed Target with Range in DES Mode
Mach Number

ACTUAL AIRSPEED REFERENCE LINE AND SCALE

A white scale on a gray background moves in front of a fixed yellow reference line next to a yellow triangle to show airspeed. The minimum airspeed indication is 30 kt.

SPEED TREND

This pointer starts at the speed symbol. The tip shows the speed the aircraft will reach in 10 s if its acceleration remains constant. The pointer appears only when it is greater than 2 kt and disappears when it is less than 1 kt.

It also disappears if the FMGECs fail.

AIRSPEED TARGET (MAGENTA OR BLUE)

This symbol gives the target airspeed or the airspeed corresponding to the target Mach number.
The target airspeed is the airspeed computed by FMGEC in managed speed mode (magenta) or entered manually on the FCU for selected speed mode (blue).
When the target speed is off the speed scale, its value is displayed as numbers below or above the speed scale.

MACH NUMBER

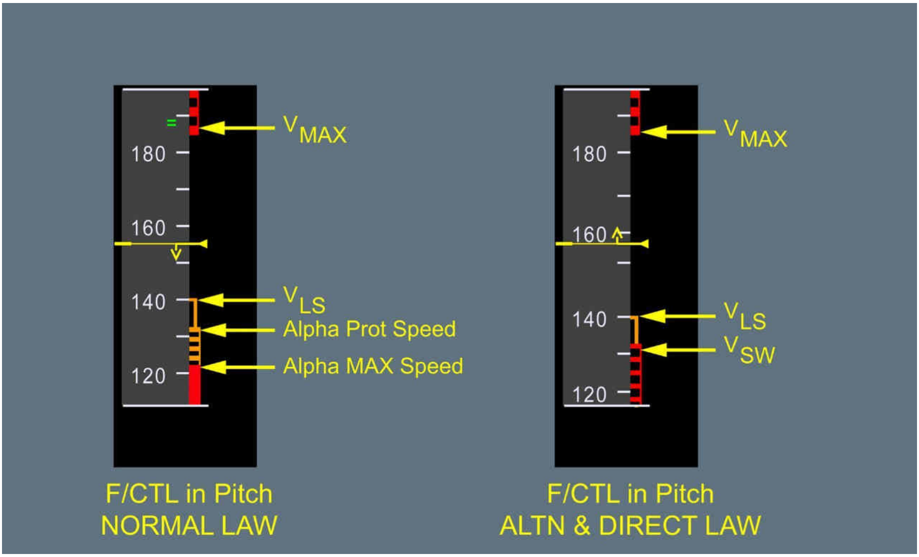
This is displayed when it is greater than 0.5.

SPEED PROTECTION

This symbol indicates the speed at which high speed protection becomes active. This symbol is not displayed in pitch alternate or direct law because the protection is not available. (*Refer to DSC-27-20-20-30 Reconfiguration Control Laws - PFD Display*)

AIRSPEED (CONT'D)

Ident.: DSC-31-40-00000645.0003001 / 12 MAY 23
Applicable to: ALL


180
160
140
120
VMAX
VLS
Alpha Prot Speed
Alpha MAX Speed
F/CTL in Pitch
NORMAL LAW
180
160
140
120
VMAX
VLS
VSW
F/CTL in Pitch
ALTN & DIRECT LAW

MINIMUM SELECTABLE SPEED (VLS)

The top of the amber strip along the speed scale indicates this speed. It represents the lowest selectable speed providing an appropriate margin to the stall speed (*Refer to DSC-22_10-50-20 Characteristic Speeds*).
VLS information is inhibited from touchdown until 1 s after liftoff.

Note: *During the cruise phase, the calculation of the alpha protection speed is less accurate than the calculation performed in other flight phases. Therefore, this alpha speed protection may be above the real alpha protection speed. In this case, the black and amber strip of the alpha protection speed extends over the VLS. As a result, VLS is not visible. However, all protections are still available.*

ALPHA PROTECTION SPEED

The top of a black and amber strip along the speed scale indicates this speed.
It represents the speed corresponding to the angle of attack at which alpha protection becomes active (*Refer to DSC-27-20-10-20 Protections - High Angle of Attack Protection*).
It is displayed when in pitch normal law.

ALPHA MAX SPEED

The top of a red strip along the speed scale indicates this speed. It represents the speed corresponding to the maximum angle of attack that the aircraft can attain in pitch normal law (*Refer to DSC-27-20-10-20 Protections - High Angle of Attack Protection*).
It is displayed when in pitch normal law.

MAXIMUM ALLOWABLE SPEED (VMAX)

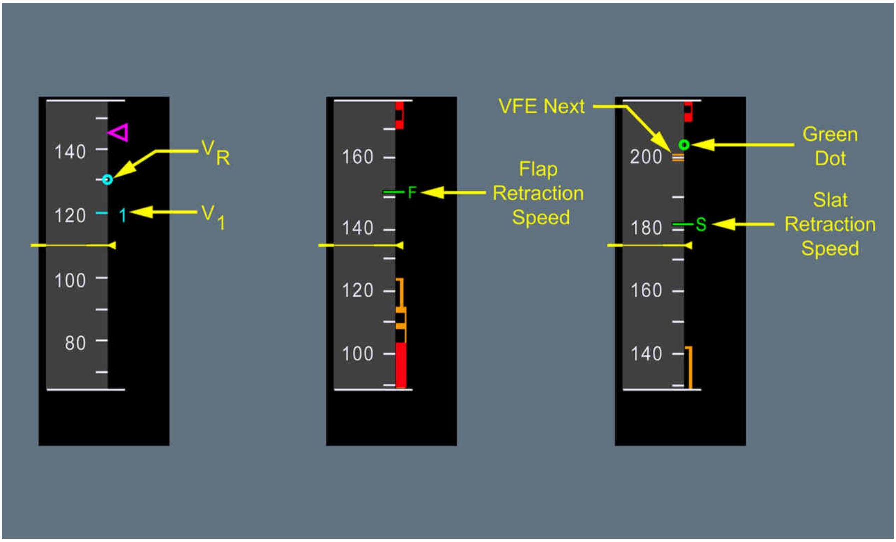
The lower end of a red and black strip along the speed scale defines this speed.

It is the lowest of the following:
- VMO or the speed corresponding to MMO
- VLE
- VFE.

(*Refer to DSC-22_10-50-20 Characteristic Speeds*)

STALL WARNING SPEED (VSW)

The top of a red and black strip along the speed scale defines this speed.
It is the speed corresponding to the stall warning (*Refer to DSC-27-20-10-20 Protections - High Angle of Attack Protection*).
VSW information is inhibited from touchdown until 5 s after liftoff.
It is displayed when operating in pitch alternate or pitch direct law.



DECISION SPEED (V1)

This speed represented by the number (1) is manually inserted by the flight crew in the MCDU.
When it is off the scale, the upper part of the scale shows it in numbers.
It disappears after liftoff (*Refer to DSC-22_10-50-50 Other Speeds*).

ROTATION SPEED (VR)

VR is entered on the PERF TAKEOFF page of the MCDU and is indicated by a cyan circle (o).
This cyan circle is visible during takeoff.

Note: *1. V2 is represented by the target speed index during takeoff.*
2. V2 is manually inserted by the flight crew via the MCDU.

MINIMUM FLAP RETRACTION SPEED

This is represented by a F. It appears when the flap selector is in position 2 or 3. (*Refer to DSC-22_10-50-20 Characteristic Speeds*)

MINIMUM SLAT RETRACTION SPEED

This is represented by a S. It appears when flap selector is in position 1. (*Refer to DSC-22_10-50-20 Characteristic Speeds*)

GREEN DOT (ENGINE-OUT OPERATING SPEED IN CLEAN CONFIGURATION)

This green dot (•) appears when the aircraft is flying in clean configuration.

It shows the speed corresponding to the best lift-to-drag ratio.

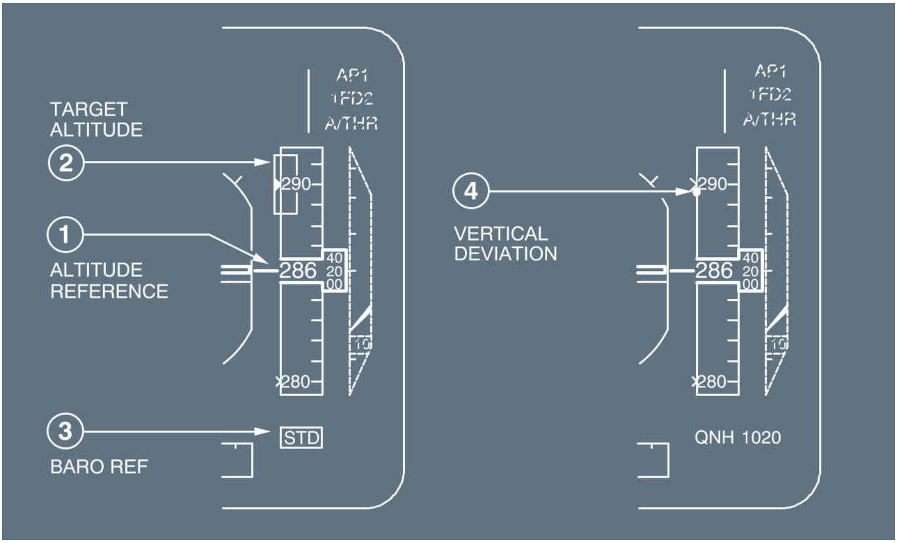
VFE NEXT

The VFE next symbol is an amber double bar (=) showing the VFE corresponding to the next FLAPS lever position.
It appears when the aircraft altitude is below 20 000 ft (*Refer to DSC-22_10-50-30 Limit Speeds*).

ALTITUDE

Ident.: DSC-31-40-A-00000653.0015001 / 14 AUG 12
Applicable to: LV-KHT, LV-KHU

GENERAL


TARGET ALTITUDE
2
1
ALTITUDE REFERENCE
3
BARO REF
AP1
1FD2
A/THR
290
286
40
20
00
10
280
STD
4
VERTICAL DEVIATION
AP1
1FD2
A/THR
290
286
40
20
00
10
280
QNH 1020

(1) Altitude Indication
This appears both as a white moving scale and as a green digital readout on a grey blackground. “NEG” appears in the window in white for negative altitudes. The altitude window changes from yellow to amber, if the aircraft deviates from the FCU-selected altitude or flight level.
On any approach for which minimum value is entered in the FMGEC, the altitude numbers change from green to amber, when the aircraft goes below the minimum.

(2) Target Altitude or Selected Flight Level Symbol (blue or magenta)

This symbol shows the FCU-selected altitude (if QNH BARO reference is selected), or the selected flight level (if STD BARO reference is selected).

When the FMGEC operates in the vertical managed mode, this symbol is in magenta, if it represents a flight plan altitude constraint that the FMGEC will follow. If the target altitude or flight level is on the scale, the symbol is displayed and the numerical value appears inside the symbol.

If the target altitude or flight level is off the scale, the symbol is not displayed, and the numerical value appears above or under the scale.

(3) Barometric Reference

The display shows “STD” or it shows “QNH” and the numerical setting in hectoPascals or inches of mercury.

It pulses when the selection made by the flight crew is not correct (STD not selected above transition altitude in climb or STD still selected in approach below transition level).

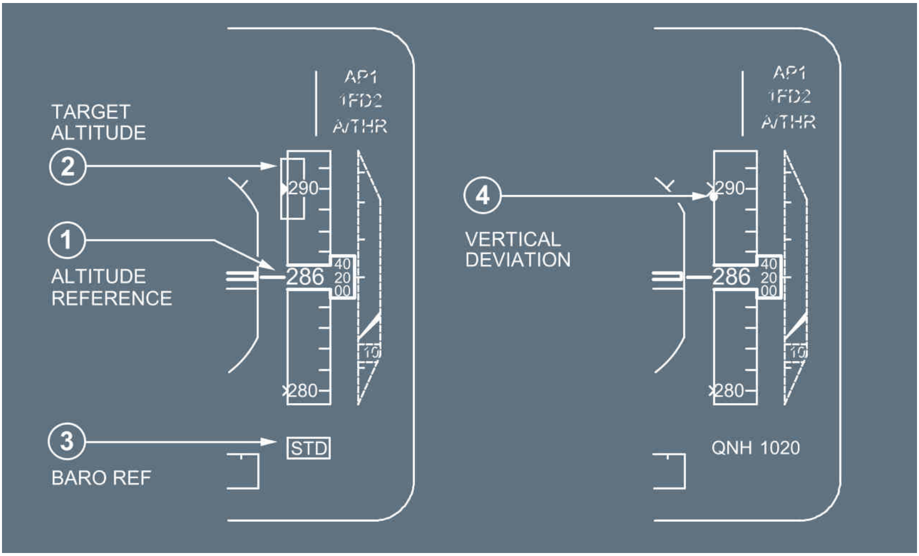
(4) Vertical Deviation

This symbol appears next to the altitude corresponding to the theoretical vertical profile computed by the FMGEC. It is displayed from the top of descent down to the MAP or to the final intercept altitude.

This symbol can either be a magenta circle or a green filled circle, depending on the installed EIS standard. In both cases, the symbol has got the same meaning.

The flight crew can read the vertical deviation directly from the altitude scale. The range is ±500 ft. When the vertical deviation value exceeds ±500 ft, the symbol stays at the range limit but changes to a filled half circle and the PROG page displays the exact value.

Ident.: DSC-31-40-A-00000653.0016001 / 16 SEP 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO



(1) Altitude Indication
This appears both as a white moving scale and as a green digital readout on a grey blackground. “NEG” appears in the window in white for negative altitudes. The altitude window changes from yellow to amber, if the aircraft deviates from the FCU-selected altitude or flight level.
On any approach for which minimum value is entered in the FMGEC, the altitude numbers change from green to amber, when the aircraft goes below the minimum.

(2) Target Altitude or Selected Flight Level Symbol
This symbol shows the FCU-selected altitude (if QNH BARO reference is selected), or the selected flight level (if STD BARO reference is selected).
The target altitude is displayed in blue when the vertical guidance is either selected or managed.
The target altitude is displayed in white when a vertical approach mode is engaged (G/S*, G/S, F-G/S* ◁ , F-G/S ◁ , FINAL APP ◁ , LAND, FLARE, ROLL OUT). The aircraft disregards the target altitude when a vertical approach mode is engaged.
The target altitude is displayed in magenta when it represents an altitude constraint of the F-PLN while in managed vertical guidance.

If the target altitude or flight level is on the scale, the symbol is displayed and the numerical value appears inside the symbol.
If the target altitude or flight level is off the scale, the symbol is not displayed, and the numerical value appears above or under the scale.

(3) Barometric Reference
The display shows “STD” or it shows “QNH” and the numerical setting in hectoPascals or inches of mercury.
It pulses when the selection made by the flight crew is not correct (STD not selected above transition altitude in climb or STD still selected in approach below transition level).

(4) Vertical Deviation
This symbol appears next to the altitude corresponding to the theoretical vertical profile computed by the FMGEC. It is displayed from the top of descent down to the MAP or to the final intercept altitude.
This symbol can either be a magenta circle or a green filled circle, depending on the installed EIS standard. In both cases, the symbol has got the same meaning.
The flight crew can read the vertical deviation directly from the altitude scale. The range is ±500 ft.

When the vertical deviation value exceeds ±500 ft:
- The symbol stays at the range limit, but changes to a filled half circle, and
- The value is indicated on the left of the symbol in hundreds of feet, and
- The MCDU PROG page displays the exact value.

Ident.: DSC-31-40-A-00014769.0001001 / 29 OCT 13
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

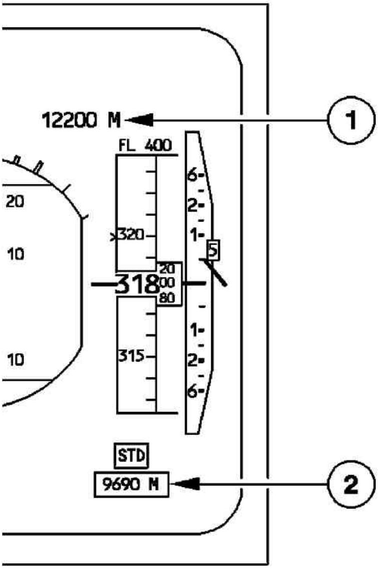
APPROACH MINIMUM INDICATION

Approach minimum is displayed on the altitude scale by an amber indication.

Ident.: DSC-31-40-A-00000658.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

METRIC ALTITUDE INDICATIONS

If metric reference is selected on the FCU two additional symbols are displayed on PFD.



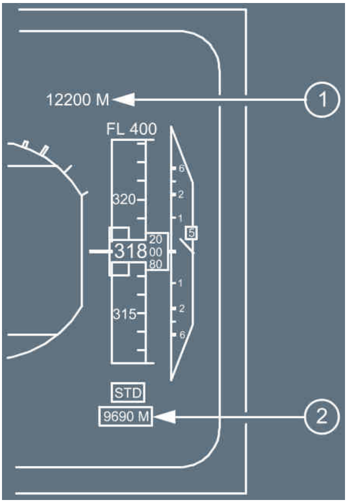
(1) Target altitude or selected flight level (magenta or blue)
The display shows the selected altitude value in meters.

(2) Altitude indication (green)
The display shows the actual aircraft altitude value in meters.

Ident.: DSC-31-40-A-00000658.0003001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

METRIC ALTITUDE INDICATIONS

If metric reference is selected on the FCU two additional symbols are displayed on PFD.

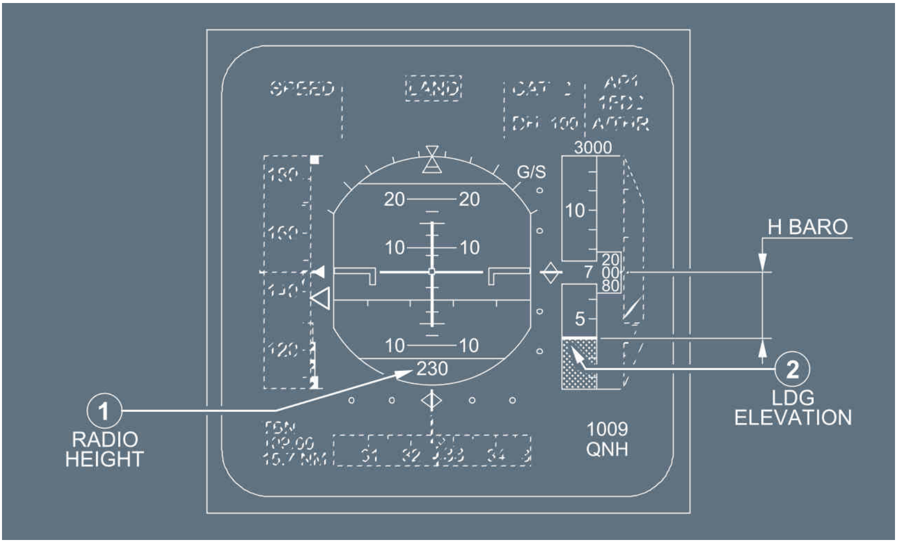

12200 M
FL 400
320
318
20
00
80
315
6
2
1
5
1
2
6
STD
9690 M
1
2

(1) Target altitude or selected flight level (magenta or blue or white)
The display shows the selected altitude value in meters.

(2) Altitude indication (green)
The display shows the actual aircraft altitude value in meters.

Ident.: DSC-31-40-A-00000660.0008001 / 13 JAN 14
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

METRIC ALTITUDE INDICATIONS (CONT'D)


SPEED
LAND
CAT 3
DH 100
AP1
1FD2
A/THR
3000
G/S
20
20
10
10
10
10
230
10
5
7
20
00
80
H BARO
1
RADIO
HEIGHT
2
LDG
ELEVATION
ISN
109.00
15.7 NM
31
32
33
34
1009
QNH

(1) Radio Height

This quantity appears when it is less than 2 500 ft.

- If a DH has been entered, the radio height appears:
  - In green, when DH +100 ft < RA < 2 500 ft
  - In amber, when RA < DH +100 ft.

  If "NO" is entered as the DH on the MCDU APPROACH page, 0 ft becomes a default value.

  When the aircraft reaches the decision height selected on the MCDU, DH letters flash amber for three seconds, then stay in amber above the radio height indication.
- If no DH has been entered or if both FMGECs fail, the radio height appears:
  - In green, when 400 ft < RA < 2 500 ft
  - In amber, when RA ≤ 400 ft.

The radio height indication changes every 10 ft down to 50 ft, then every 5 ft down to 10 ft, then every foot.

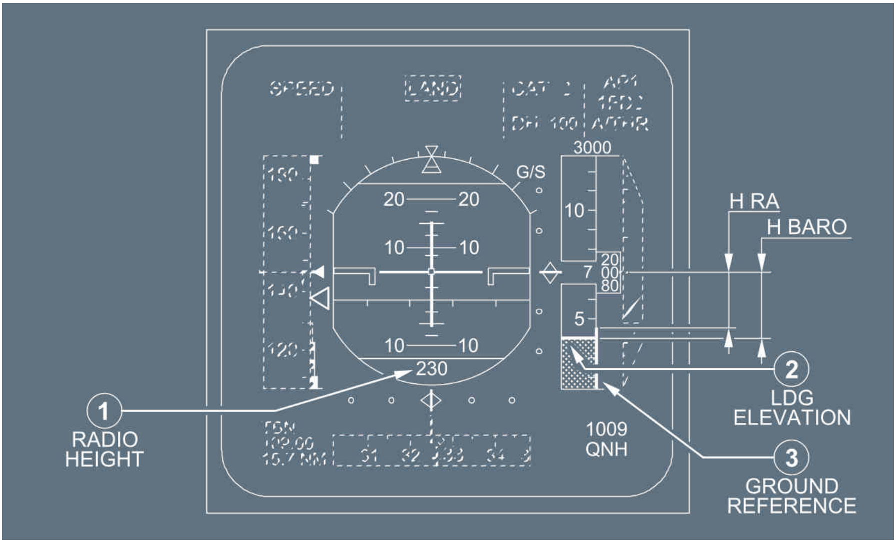
(2) Landing Elevation (brown)

The top of the brown surface on the altitude scale represents the landing elevation at the flight-planned destination.

It is displayed:
- During flight phases 7 and 8, and
- If the QNH reference mode is selected.

Ident.: DSC-31-40-A-00000660.0003001 / 13 JAN 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

METRIC ALTITUDE INDICATIONS (CONT'D)


SPEED
LAND
CAT 3
AP1
1FD2
DH 100
A/THR
3000
G/S
20
20
10
10
10
10
230
10
7
5
20
00
80
H RA
H BARO
1009
QNH
1
RADIO HEIGHT
2
LDG ELEVATION
3
GROUND REFERENCE

(1) Radio Height

This quantity appears when it is less than 2 500 ft.
- If a DH has been entered, the radio height appears:
  - In green, when DH +100 ft < RA < 2 500 ft
  - In amber, when RA < DH +100 ft.

  If "NO" is entered as the DH on the MCDU APPROACH page, 0 ft becomes a default value.

  When the aircraft reaches the decision height selected on the MCDU, DH letters flash amber for three seconds, then stay in amber above the radio height indication.
- If no DH has been entered or if both FMGCs fail, the radio height appears:
  - In green, when 400 ft < RA < 2 500 ft
  - In amber, when RA ≤ 400 ft.

The radio height indication changes every 10 ft down to 50 ft, then every 5 ft down to 10 ft, then every foot.

(2) Landing Elevation (brown)
The top of the brown surface on the altitude scale represents the landing elevation at the flight-planned destination.

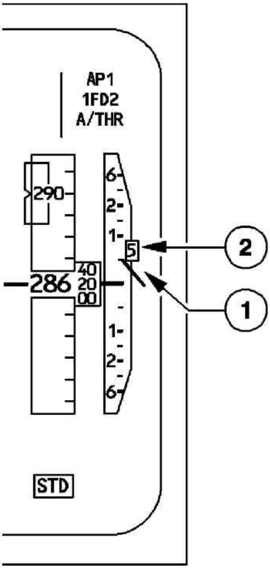
It is displayed:
- During flight phases 7 and 8, and
- If the QNH reference mode is selected.

(3) Ground reference
A red ribbon on the right of the altitude scale represents the field elevation. This ribbon, which is driven by the radio altimeter signal, is displayed below 570 ft.
It moves up, as does the lower line of the attitude sphere, with the altitude scale as the aircraft descends. When the aircraft has touched down, the top of this ribbon is at the middle of the altitude window.

VERTICAL SPEED

Ident.: DSC-31-40-00000664.0002001 / 21 MAR 17
Applicable to: ALL

The displayed vertical speed information is normally based on both inertial and barometric data. If inertial data is not available, it is automatically replaced by barometric information. In this case, the window around the numerical value becomes amber.



(1) Analog pointer
This pointer, which is normally green, points to a white vertical speed scale displayed on a grey background and graduated at intervals of 500 ft/min.
If the V/S is greater than 6 000 ft/min, the pointer stays at the end of the scale.

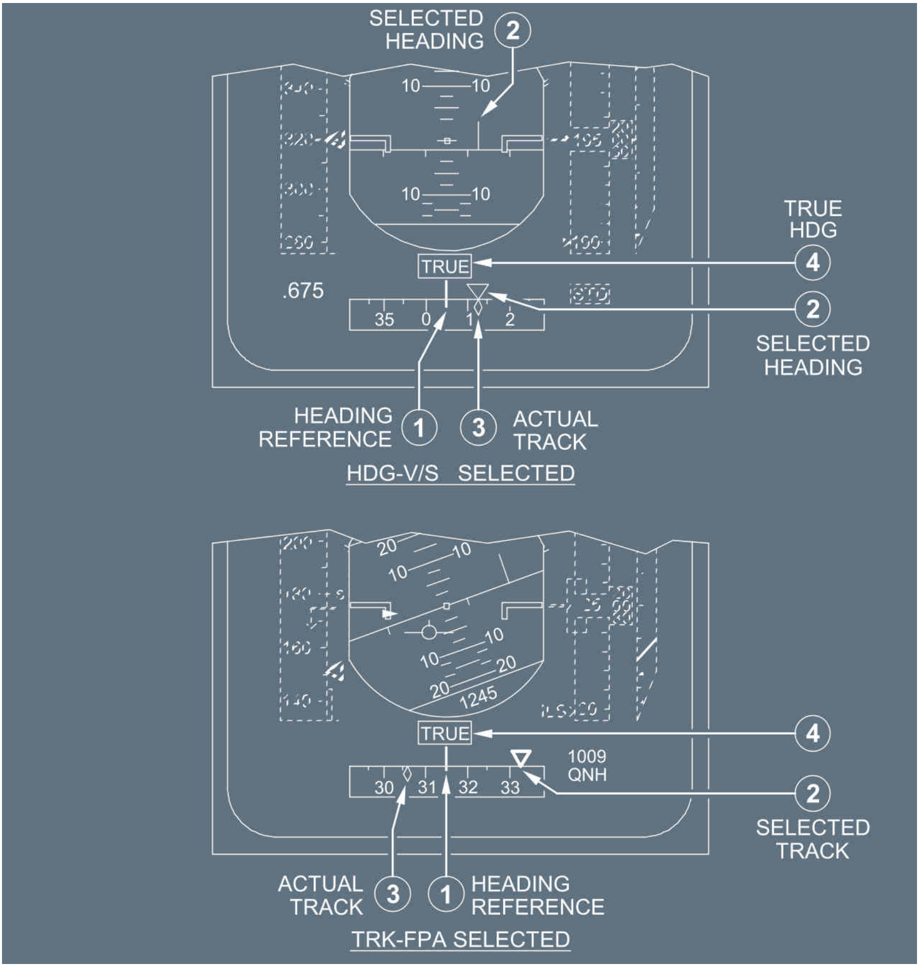
(2) Digital indication
This number, normally green, is the vertical speed in hundreds of feet per minute.
It disappears if the vertical speed is less than 200 ft/min.

The analog pointer and the digital indication become amber, if :
- V/S is greater than 6 000 ft/min, (climb or descent)
- V/S is greater than 2 000 ft/min, during descent when 1 000 ft < RA < 2 500 ft, or
- V/S is greater than 1 200 ft/min, during descent and RA < 1 000 ft.

Note: *For TCAS refer to DSC / 34-SURV / 60.TCAS / 20.Controls and Indicators.*

HEADING

Ident.: DSC-31-40-00000670.0003001 / 09 OCT 12
Applicable to: LV-GKO, LV-GKP


SELECTED HEADING ②
10 10
10 10
TRUE
.675
35 0 1 2
TRUE HDG ④
② SELECTED HEADING
HEADING REFERENCE ①
③ ACTUAL TRACK
HDG-V/S SELECTED
20 10
10
10
10 20
20 1245
TRUE
1009 QNH
30 31 32 33
④
② SELECTED TRACK
ACTUAL TRACK ③
① HEADING REFERENCE
TRK-FPA SELECTED

(1) Heading Reference Line and Scale
A white scale on a grey background moves in front of a fixed yellow reference line to show the actual magnetic heading.

(2) Selected Heading or Track Index (blue)

The pointer indicates the heading or track selected on the FCU HDG-TRK counter.
The index is replaced by digits on the right or left side of the scale, when the selected value is off the scale.
If the FD pb is OFF, a second heading or track symbol appears on the horizon line and markers are displayed every 10 °.

(3) Actual Track Symbol

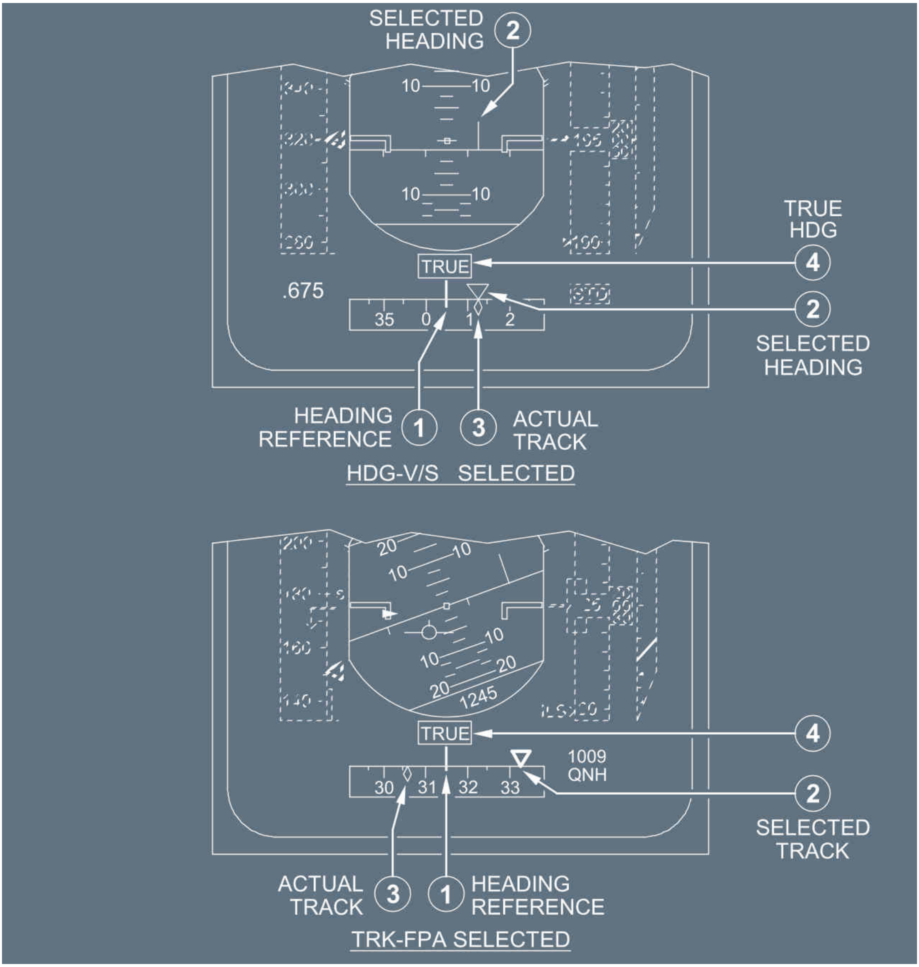
This symbol is a small green diamond.

(4) True heading (blue)

At high latitude above 82.5 ° North or 60.5 ° South (or entering the north, magnetic polar region latitude 73.5 ° N and longitude between 117.5 ° W and 92.5 ° W), the ADIRUs replace magnetic heading by true heading on the EFIS and DDRMI.
When the aircraft is close to these regions (latitude above 82 ° North or 60 ° South or approaching the north polar region: 73 ° N and longitude between 90 ° W and 120 ° W), the ADIRU causes the "SELECT TRUE REF" message to appear on the ND, thereby requesting a change in the north reference.
In true heading configuration at slats extension, « TRUE » will flash for 9 s then remain steady.

HEADING

Ident.: DSC-31-40-00000670.0011001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


SELECTED HEADING ②
10 10
10 10
TRUE
TRUE HDG ④
.675
35 0 1 2
② SELECTED HEADING
HEADING REFERENCE ①
③ ACTUAL TRACK
HDG-V/S SELECTED
20 10
10 10
10 10
20 20
1245
TRUE
④
1009 QNH
30 31 32 33
② SELECTED TRACK
ACTUAL TRACK ③
① HEADING REFERENCE
TRK-FPA SELECTED

(1) Heading Reference Line and Scale
A white scale on a grey background moves in front of a fixed yellow reference line to show the actual magnetic heading.

(2) Selected Heading or Track Index (blue)
The pointer indicates the heading or track selected on the FCU HDG-TRK counter.
The index is replaced by digits on the right or left side of the scale, when the selected value is off the scale.
If the FD pb is OFF, a second heading or track symbol appears on the horizon line and markers are displayed every 10 °.

(3) Actual Track Symbol
This symbol is a small green diamond.

(4) True heading (blue)
At high latitude above 82.5 ° North or 60.5 ° South (or entering the north, magnetic polar region latitude 73.5 ° N and longitude between 117.5 ° W and 92.5 ° W), the ADIRUs replace magnetic heading by true heading on the EFIS.
When the aircraft is close to these regions (latitude above 82 ° North or 60 ° South or approaching the north polar region: 73 ° N and longitude between 90 ° W and 120 ° W), the ADIRU causes the "SELECT TRUE REF" message to appear on the ND, thereby requesting a change in the north reference.
In true heading configuration at slats extension, «TRUE» will flash for 9 s then remain steady.

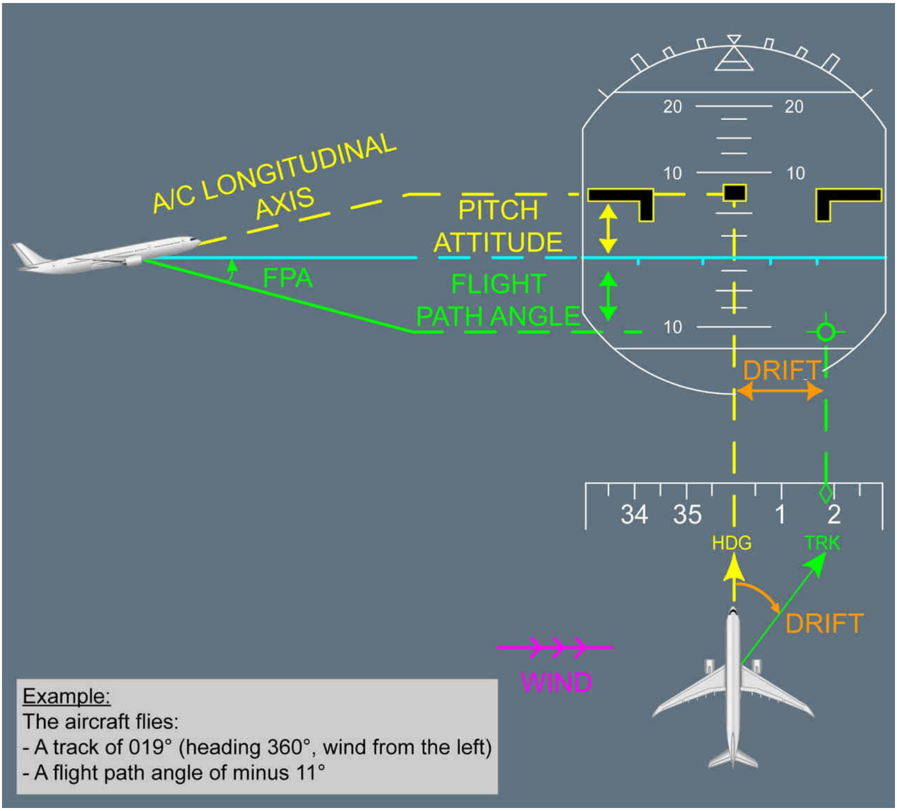
FLIGHT PATH VECTOR

Ident.: DSC-31-40-00000675.0003001 / 03 DEC 19
Applicable to: ALL

The Flight Path Vector (FPV) is a flight reference with the TRK and FPA as basic guidance parameters. When TRK/FPA is selected on the FCU, the FPV appears on the PFD.

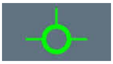
INFORMATION PRESENTATION

The FPV appears on the PFD as a symbol, known as the "bird". The "bird" indicates the track and flight path angle in relation to the ground.
The track is indicated on the PFD by a green diamond on the compass, in addition to the lateral movement of the "bird" in relation to the fixed aircraft symbol. On the ND, the track is indicated by a green diamond on the compass scale. The difference in angle between track and heading indicates the drift.
The flight path angle is indicated on the PFD by the vertical movement of the "bird" in relation to the pitch scale.
With the Flight Directors (FDs) selected on, the Flight Path Director (FPD) replaces the HDG-VS Flight Director (FD). With both FDs pb set to off, the blue track index appears on the PFD horizon.


A/C LONGITUDINAL AXIS
PITCH ATTITUDE
FPA
FLIGHT PATH ANGLE
20
20
10
10
10
DRIFT
34
35
1
2
HDG
TRK
DRIFT
WIND

Example:
The aircraft flies:
- A track of 019° (heading 360°, wind from the left)
- A flight path angle of minus 11°

FLIGHT PATH VECTOR (FPV)



The FPV appears when the pilot selects TRK/FPA on the FCU.
The flight path vector represents the lateral and vertical trajectory of the aircraft with respect to the ground.

- On the lateral scale it indicates the aircraft's track.
- On the vertical scale it indicates the aircraft's flight path angle.

USE OF FPV

The "bird" is the flight reference that should be used when flying a stabilized segment of trajectory, e.g. a Non Precision Approach flown without the FLS function ◁ or visual circuit.

In dynamic maneuvers, the "bird" is directly affected by the aircraft inertia and has a delayed reaction. As a result, the "bird" should not be used as a flight reference in dynamic maneuvers. *Refer to FCTM/AS-BIRD Introduction* for more information.

GUIDANCE

Ident.: DSC-31-40-00000678.0001001 / 13 JAN 14
Applicable to: ALL

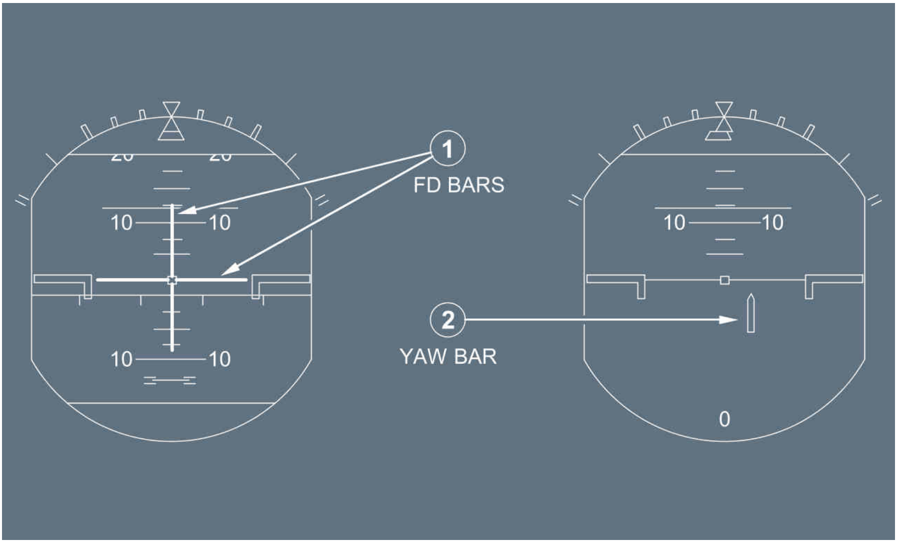
Two completely different flight director modes are available, each with its own characteristic symbols. The symbol displayed corresponds to the basic operating reference the pilot has selected – either HDG V/S or TRK FPA.
In normal operation PFD1 displays FD1 orders.
If FD1 fails, PFD1 automatically displays FD2 orders, and on the PFD1 the FD2 indication in the right column of the FMA flashes for a few seconds.
The same applies for FD2 orders normally displayed on PFD2.

IF THE CREW HAS SELECTED HDG V/S TO BE THE BASIC REFERENCE:

The PFD displays pitch and roll bars in green. They automatically move out of view at touchdown in ROLL OUT mode.

They flash for 10 s and then remain steady in the following conditions:
- reversion to the HDG V/S basic mode (manually or automatic)
- change of selected flight level when the autopilot is already engaged in ALT CAPTURE mode
- loss of LOC or G/S in LAND mode or loss of LAND mode
- at the first AP or FD engagement.

The PFD displays a yaw bar in green below 30 ft radio height if a localizer signal is available:
- during takeoff (in RWY mode)
- upon landing (in FLARE and ROLL OUT mode).

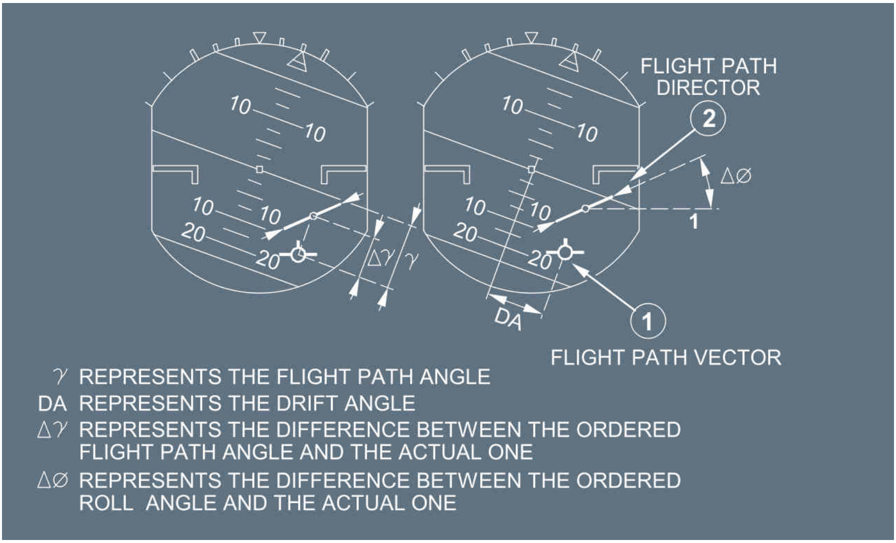


(1) FD Crossed Bars (green)

(2) Yaw Bar (green)

THE CREW HAS SELECTED TRK FPA AS THE BASIC REFERENCE:

An inertial flight path vector defines the aircraft's horizontal and vertical track, taking wind effect into account.
An associated flight path director symbol guides the flight crew onto the vertical and horizontal flight path targets.


10
10
10
10
20
20
ΔΥ
Υ
FLIGHT PATH DIRECTOR
2
ΔØ
1
DA
1
FLIGHT PATH VECTOR
Υ REPRESENTS THE FLIGHT PATH ANGLE
DA REPRESENTS THE DRIFT ANGLE
ΔΥ REPRESENTS THE DIFFERENCE BETWEEN THE ORDERED FLIGHT PATH ANGLE AND THE ACTUAL ONE
ΔØ REPRESENTS THE DIFFERENCE BETWEEN THE ORDERED ROLL ANGLE AND THE ACTUAL ONE

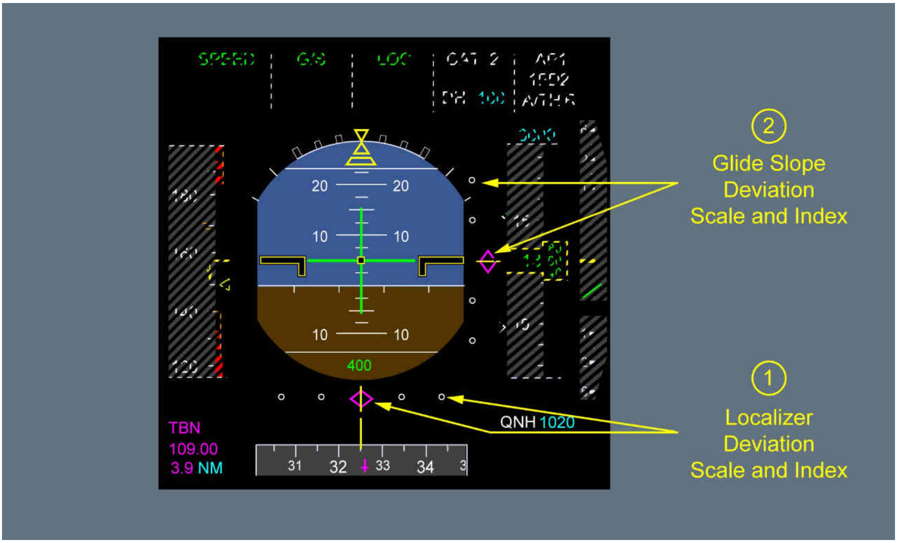
(1) Flight Path Vector (green)

(2) Flight Path Director (green)

TRAJECTORY DEVIATION

Ident.: DSC-31-40-B-00000685.0001001 / 15 NOV 21
Applicable to: ALL

ILS / GLS / SLS GUIDANCE MODE

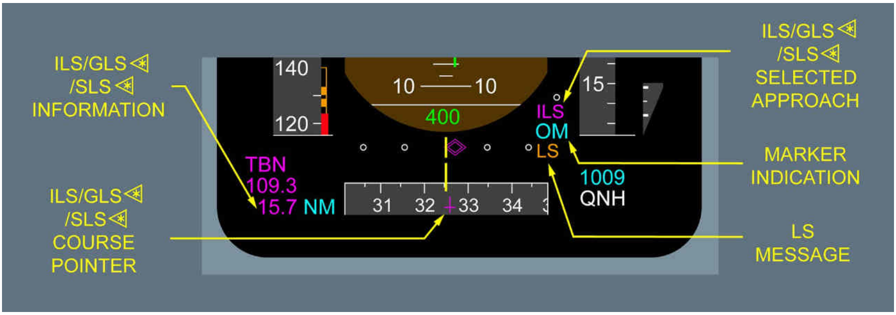

SPEED
G/S
LOC
CAT 2
AP1
1FD2
DH 100
A/THR
20
10
400
TBN
109.00
3.9 NM
QNH 1020
31
32
33
34
2
Glide Slope Deviation Scale and Index
1
Localizer Deviation Scale and Index

(1) Localizer Deviation Scale and Index

(2) Glide Slope Deviation Scale and Index
Deviation scales appear as soon as the flight crew pushes an LS pushbutton switch on the EFIS control panel. Deviation indexes appear when the glide slope and localizer signals are valid if deviation scales are displayed.
When a deviation index is out of the displayed range, only half a symbol appears at the end of the scale.
The LOC scale flashes and continues to flash if the deviation exceeds 1/4 dot for two seconds while the aircraft is between 15 ft and 1 000 ft, and CAT 2 or CAT 3 capability displayed on the FMA, and either LOC, LAND, or FLARE is engaged. The glide scale flashes and continues to flash if the deviation exceeds one dot for two seconds (above 100 ft RA).
LOC and the glide scale half index symbols flash and continue to flash when the deviation exceeds two dots for two seconds.
One dot represents a deviation of ±0.8 ° on the localizer scale and ±0.4 ° on the glide slope scale.

Ident.: DSC-31-40-B-00017848.0002001 / 15 NOV 21
Applicable to: ALL

ILS / GLS ◁ / SLS ◁ GUIDANCE MODE (CONT'D)


ILS/GLS◁
/SLS◁
INFORMATION
ILS/GLS◁
/SLS◁
COURSE
POINTER
140
120
10
10
400
TBN
109.3
15.7 NM
31
32
33
34
15
ILS
OM
LS
1009
QNH
ILS/GLS◁
/SLS◁
SELECTED
APPROACH
MARKER
INDICATION
LS
MESSAGE

ILS / GLS ◁ / SLS ◁ INFORMATION

The following information appears on the PFD, when the crew has selected an ILS frequency or GLS/SLS channel and course and pressed the LS pb:

- ILS / GLS / SLS identification as decoded by the MMR
- ILS frequency / GLS / SLS channel
- For ILS: DME distance if the ILS has a DME
- For GLS / SLS: distance to runway threshold computed by the MMR.

ILS / GLS ◁ / SLS ◁ COURSE POINTER

This pointer appears on the PFD, when the crew has selected an ILS frequency / GLS / SLS channel and course and pressed the LS pb.
It is a dagger-shaped symbol on the heading scale.
The ILS / GLS / SLS course pointer is replaced by digits on the right or left hand side of the heading scale (in a white box), when the ILS / GLS / SLS course value is outside the displayed portion of the heading scale.

MARKER INDICATIONS

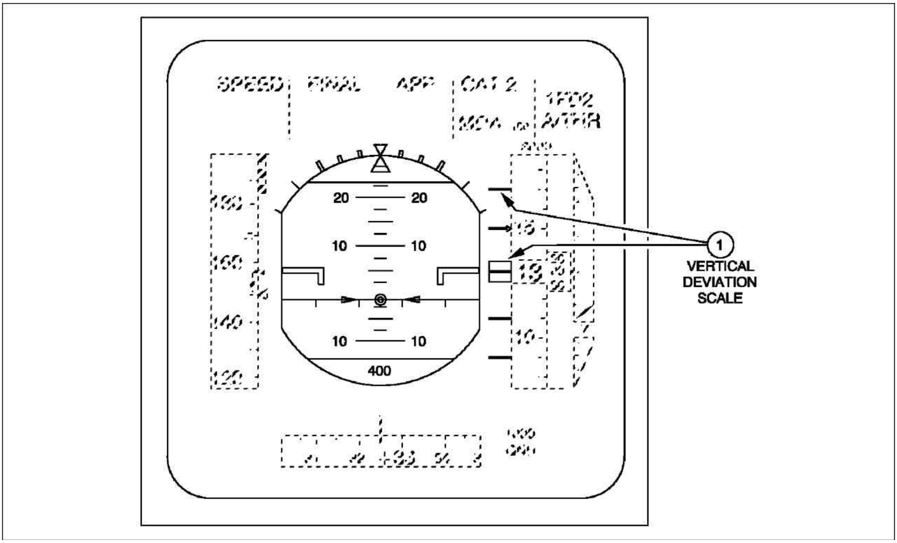
OM appears, when the aircraft flies over the outer marker
MM appears, when the aircraft flies over the middle marker
IM appears, when the aircraft flies over an airways marker beacon or the ILS / GLS ◁ inner marker.

ILS / GLS ◁ / SLS ◁ MESSAGE

This flashes amber, when the APPR mode is armed and the LS pb is not selected.

Ident.: DSC-31-40-B-00000695.0006001 / 14 FEB 11
Applicable to: LV-KHT, LV-KHU

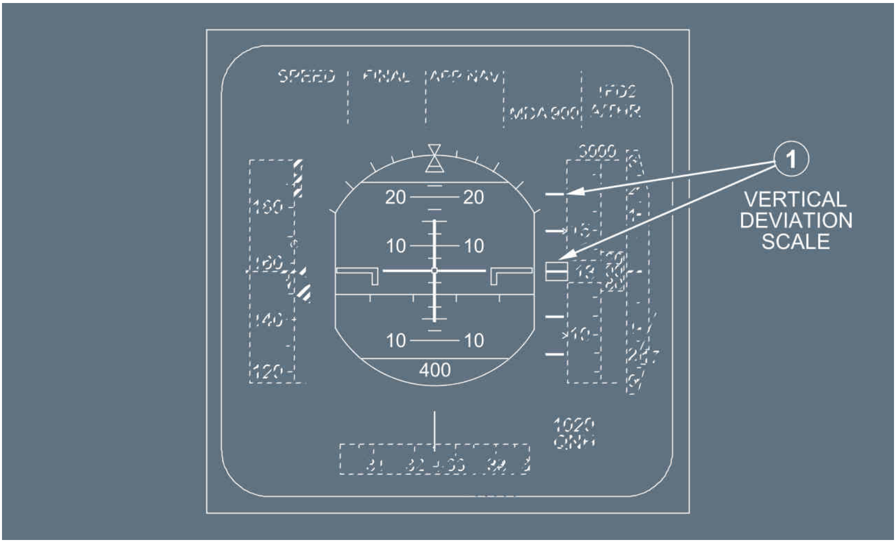
NON PRECISION APPROACH



(1) Vertical Deviation Scale and Index
The vertical deviation scale and index appear when in approach phase and, when either the FINAL APP mode is armed/engaged, or a non-LS approach has been entered. They are displayed in the approach or go-around phase, until the MDA has been reached, or the MAP or the runway has been sequenced. They give the vertical deviation with respect to the trajectory defined by the FMGEC.
Each index scale graduation represents 100 ft. The range is ±200 ft.

Note: If the LS pb-sw is pressed, glide deviation has priority over vertical deviation information. As long as V/DEV display conditions are met, and the LS pb-sw is selected, an amber V/DEV message flashes above the glide scale.

NON PRECISION APPROACH



(1) Vertical Deviation Scale and Index

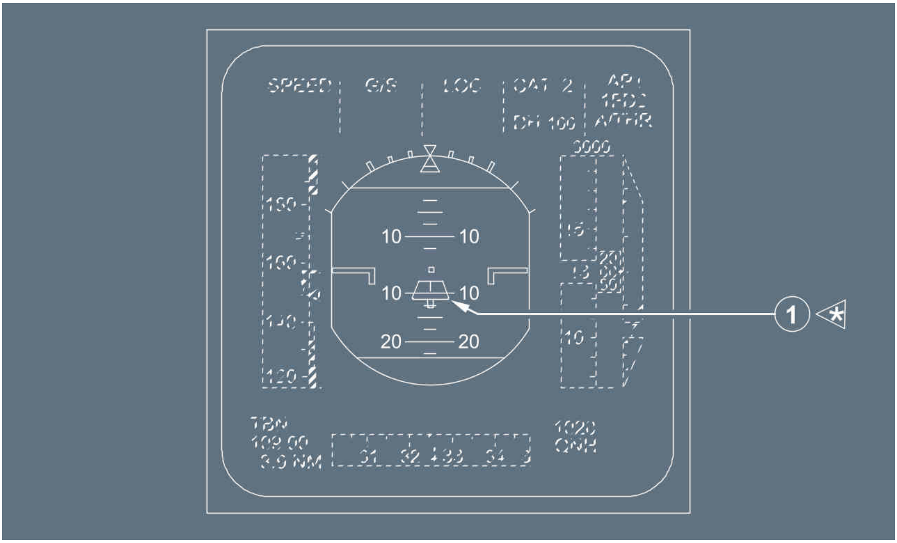
The vertical deviation scale and index appear when in approach phase and, when either the FINAL APP mode is armed/engaged, or a non-LS approach has been entered. They are displayed in the approach or go-around phase, until the MDA has been reached, or the MAP or the runway has been sequenced. They give the vertical deviation with respect to the trajectory defined by the FMGEC.
Each index scale graduation represents 100 ft. The range is ±200 ft.

When the vertical deviation value exceeds ±200 ft:
- The symbol stays at the range limit, but changes to a half rectangle, and
- The value is indicated on the left of the symbol in hundreds of feet, and
- The MCDU PROG page displays the exact value.

Note: *If the LS pb-sw is pressed, glide deviation has priority over vertical deviation information. As long as V/DEV display conditions are met, and the LS pb-sw is selected, an amber V/DEV message flashes above the glide scale.*

Ident.: DSC-31-40-B-00017857.0003001 / 21 MAR 16
Applicable to: ALL

RISING RUNWAY SYMBOL


SPEED
G/S
LOC
CAT 2
DH 100
AP1
1FD2
A/THR
3000
180
160
140
120
10
10
10
10
20
20
15
13
10
220
200
TBN
109.00
3.9 NM
31
32
33
34
1020
QNH
1

(1) Rising Runway Symbol (magenta)

If:
- The localizer signal is valid
- The radio height is available, and
- The yaw bar is not displayed

at 200 ft RA the runway symbol starts from the bottom of the pitch scale. Its vertical deviation is driven by the radio height and its lateral deviation by the localizer.

Note: *When the rising runway option is installed, the lower line of the attitude sphere does not move for ground reference.*

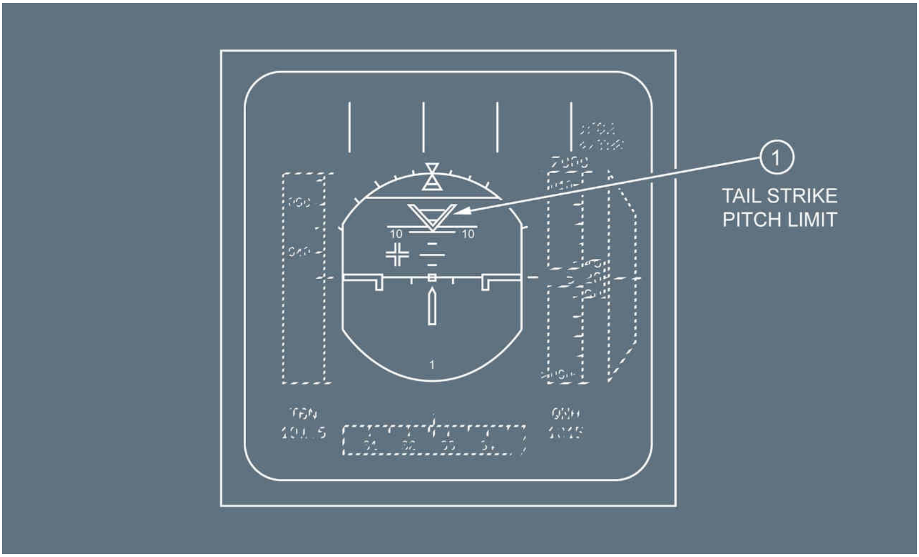
FLIGHT MODE ANNUNCIATOR

Ident.: DSC-31-40-00000697.0003001 / 18 MAY 22
Applicable to: ALL

For a detailed discussion of legends and messages that may appear during FMGES operations, see AFS chapter (*Refer to DSC-22_30-80-20 FMA Display*).

TAIL STRIKE PITCH LIMIT INDICATOR

Ident.: DSC-31-40-00017879.0008001 / 21 MAR 16
Applicable to: ALL

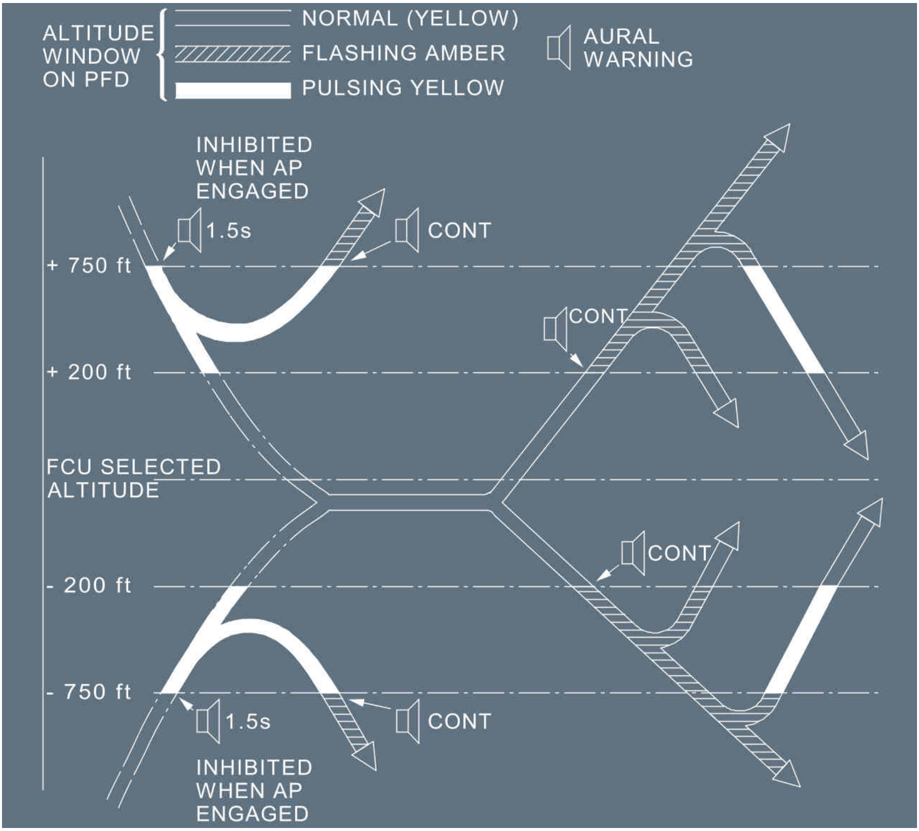


(1) Tail Strike Pitch Limit
The pitch limit indicates the maximum pitch attitude to avoid the tail strike risk at takeoff and landing. During takeoff, the indication progresses from the pitch limit value with main landing gear compressed, to the pitch limit value with main landing gear extended. The indication is removed when the tail strike risk disappears.
During landing, the indication is a fixed value corresponding to the main landing gear compressed. The indication appears at 400 ft radio height.

ALTITUDE ALERT

Ident.: DSC-31-40-00000702.0003001 / 17 MAR 11
Applicable to: LV-KAN, LV-KAO

The FWC generates an altitude warning (C chord sound, and PFD's altitude window pulses in yellow or flashes in amber), when the aircraft approaches a preselected altitude or flight level or when it deviates from its selected altitude or flight level.
This warning results from a comparison between the altitude (ADIRS) and the preselected altitude displayed on the FCU.

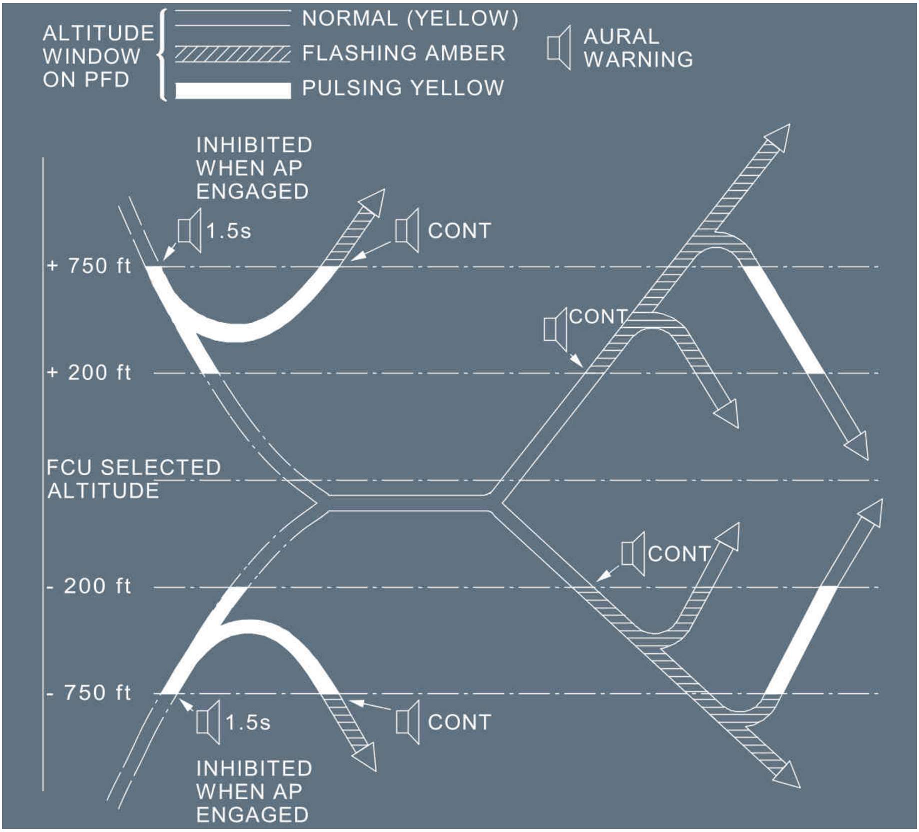

ALTITUDE WINDOW ON PFD
NORMAL (YELLOW)
FLASHING AMBER
PULSING YELLOW
AURAL WARNING
INHIBITED WHEN AP ENGAGED
1.5s
CONT
+ 750 ft
+ 200 ft
CONT
FCU SELECTED ALTITUDE
CONT
- 200 ft
- 750 ft
1.5s
CONT
INHIBITED WHEN AP ENGAGED

- The continuous C chord is cancelled by selecting a new altitude, by pushing the ECAM control panels' EMER CANC pb, or by pressing either MASTER WARN pb.
- The selection of a new altitude stops the flashing of a new altitude window.
- The altitude alert is inhibited :
  - When the slats are out with the landing gear selected down, or
  - In approach after the aircraft captures the glideslope, or
  - When the landing gear is locked down.
  - In the case of a TCAS RA

ALTITUDE ALERT

Ident.: DSC-31-40-00000702.0002001 / 16 MAR 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

The FWC generates an altitude warning (C chord sound, and PFD's altitude window pulses in yellow or flashes in amber), when the aircraft approaches a preselected altitude or flight level or when it deviates from its selected altitude or flight level.
This warning results from a comparison between the altitude (ADIRS) and the preselected altitude displayed on the FCU.

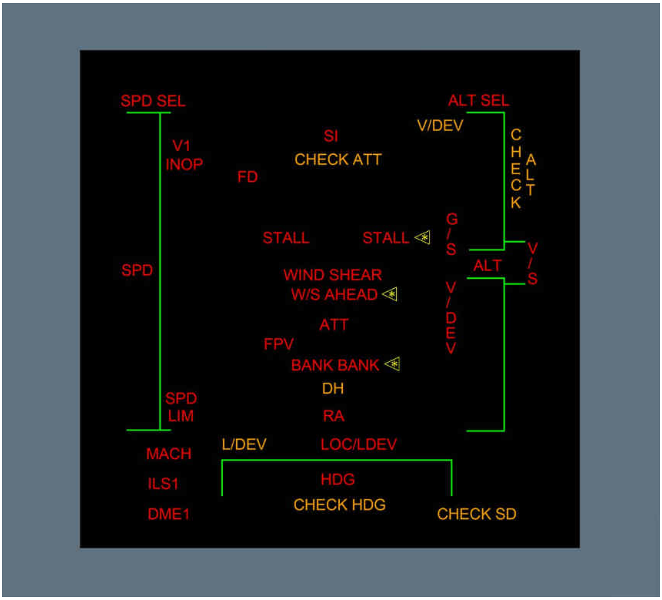

ALTITUDE WINDOW ON PFD
NORMAL (YELLOW)
FLASHING AMBER
PULSING YELLOW
AURAL WARNING
INHIBITED WHEN AP ENGAGED
1.5s
CONT
+ 750 ft
CONT
+ 200 ft
FCU SELECTED ALTITUDE
CONT
- 200 ft
- 750 ft
1.5s
CONT
INHIBITED WHEN AP ENGAGED

- The continuous C chord is cancelled by selecting a new altitude, by pushing the ECAM control panels' EMER CANC pb, or by pressing either MASTER WARN pb.
- The altitude window stops flashing, if a new altitude is selected.
- The altitude alert is inhibited:
  - When the slats are out with the landing gear selected down, or
  - In approach after the aircraft captures the glideslope, or
  - When the landing gear is locked down.

FLAGS AND MESSAGES DISPLAYED ON PFD

Ident.: DSC-31-40-D-00020295.0001001 / 04 NOV 21
Applicable to: ALL

FLAGS AND MESSAGES DISPLAYED ON PFD - SCHEMATIC


SPD SEL
ALT SEL
V/DEV
SI
V1
INOP
CHECK ATT
FD
CHECK
ALT
G/S
STALL
STALL
V/S
SPD
ALT
WIND SHEAR
W/S AHEAD
V/DEV
ATT
FPV
BANK BANK
DH
SPD
LIM
RA
MACH
L/DEV
LOC/LDEV
ILS1
HDG
CHECK HDG
DME1
CHECK SD

Note: *1. All flags flash for 9 s, then remain steady, except, V1 INOP which is steady.*
2. For information on the TCAS flag, Refer to DSC-34-20-60-20 PFD Indications.

Ident.: DSC-31-40-D-00020305.0001001 / 04 NOV 21
Applicable to: ALL

ALT

Appears if the altitude information fails.

Ident.: DSC-31-40-D-00020307.0001001 / 04 NOV 21
Applicable to: ALL

ALT SEL

Appears if the selected altitude information fails.

Ident.: DSC-31-40-D-00020296.0001001 / 04 NOV 21
Applicable to: ALL

ATT

Appears when the PFD loses all attitude data, its entire sphere is cleared to display the ATT flag.

Ident.: DSC-31-40-D-00020297.0001001 / 04 NOV 21
Applicable to: ALL

CHECK ATT, CHECK ALT, CHECK HDG

Refer to DSC-31-05-60 Messages on the Display Units (DUs) - Side1/Side2 Discrepancy Messages.

Ident.: DSC-31-40-D-00020322.0001001 / 04 NOV 21
Applicable to: ALL

CHECK SD, CHECK CAPT (F/O) PFD, CHECK CAPT (F/O) ND, CHECK EWD, DU NOT MONITORED

Refer to DSC-31-05-60 Messages on the Display Units (DUs) - Feedback Messages.

Ident.: DSC-31-40-D-00020312.0001001 / 04 NOV 21
Applicable to: ALL

DH

Appears when the aircraft reaches the selected DH.

Ident.: DSC-31-40-D-00020319.0001001 / 04 NOV 21
Applicable to: ALL

DME 1(2)

Appears when the DME distance is not valid, a DME 1 (on PFD1) or DME 2 (on PFD2) flag replaces the DME distance indication.

Ident.: DSC-31-40-D-00020300.0001001 / 04 NOV 21
Applicable to: ALL

FD

Appears if both FMGECs fail, or if both FDs are disengaged and the FD pb is ON and the attitude is valid.

Ident.: DSC-31-40-D-00020299.0001001 / 04 NOV 21
Applicable to: ALL

FPV

Appears when the drift angle or flight path angle is not valid in the TRK FPA mode.

Ident.: DSC-31-40-D-00020313.0001001 / 04 NOV 21
Applicable to: ALL

HDG

Appears if the heading information fails.

Ident.: DSC-31-40-D-00020320.0001001 / 04 NOV 21
Applicable to: ALL

ILS 1(2) OR FLS ◁ 1(2) OR GLS ◁ 1(2) OR MLS ◁ 1(2)

Appears if an ILS/FLS ◁ /GLS ◁ /MLS ◁ frequency/channel fails or if either the LOC/F-LOC ◁ or G/S /F-G/S ◁ signals fail. An ILS/FLS ◁ /GLS ◁ /MLS ◁ 1 (on PFD1) or ILS/FLS ◁ /GLS ◁ /MLS ◁ 2 (on PFD2) flag replaces the ILS/FLS ◁ /GLS ◁ /MLS ◁ frequency/channel indication.

Ident.: DSC-31-40-D-00024528.0001001 / 04 NOV 21
Applicable to: ALL

L/DEV

Appears at the top left of the LOC scale, this message flashes when the FINAL mode is armed/engaged, and the LS pb is selected.

Ident.: DSC-31-40-D-00020323.0001001 / 04 NOV 21
Applicable to: ALL

L/DEV

Appears when the crosstrack error is not valid.

Ident.: DSC-31-40-D-00020309.0001001 / 04 NOV 21
Applicable to: ALL

LOC OR G/S OR F-LOC ◁ OR F-G/S ◁

If the localizer or glideslope receiver fails, a LOC or G/S flag appears on the deviation scale.
If the pseudo localizer or pseudo glideslope deviation is invalid, an F-G/S ◁ or F-LOC ◁ flag appears on the deviation scale.

If there is an inconsistency in the approach mode selection within one MMR, LOC and F-LOC ⊲✱ flags and G/S and F-G/S ⊲✱ flags appear.

Ident.: DSC-31-40-D-00020315.0001001 / 04 NOV 21
Applicable to: ALL

MACH

Appears if the MACH data fails.

Ident.: DSC-31-40-D-00020311.0001001 / 04 NOV 21
Applicable to: ALL

RA

Appears if both radio altimeters fails.

Ident.: DSC-31-40-D-00020298.0001001 / 03 MAY 23
Applicable to: ALL

SI

Appears if the sideslip information is lost.

Ident.: DSC-31-40-D-00020301.0001001 / 04 NOV 21
Applicable to: ALL

SPD

Appears if the speed information fails.

Ident.: DSC-31-40-D-00020303.0001001 / 04 NOV 21
Applicable to: ALL

SPD LIM

Appears when both FMGECs (flight envelope part) are inoperative, or in case of dual flap/slat channel failure.
In this case, the following PFD information are lost: VLS, S, F, Green Dot, Vtrend, VMAX, VFE next, VSW.

Ident.: DSC-31-40-D-00020302.0001001 / 04 NOV 21
Applicable to: ALL

SPD SEL

Appears if the selected speed information fails.

Ident.: DSC-31-40-D-00020321.0001001 / 04 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

STALL STALL WARNING

Appears when PFD displays this message when the AOA is greater than a predetermined angle.
WINDSHEAR message inhibits this message in normal law.

Ident.: DSC-31-40-D-00020316.0001001 / 04 NOV 21
Applicable to: ALL

V/DEV

Appears at the top of the glide scale.
This message flashes in the following conditions:

- In approach phase, and
- The ILS/LS pb is selected, and
- When either the FINAL mode is armed/engaged, or a non-LS approach has been selected.

Ident.: DSC-31-40-D-00020310.0001001 / 04 NOV 21
Applicable to: ALL

V/DEV

Appears if the vertical deviation information fails, and the ILS/LS pb is not pressed.

Ident.: DSC-31-40-D-00020308.0001001 / 04 NOV 21
Applicable to: ALL

V/S

Appears if the vertical speed information fails.

Ident.: DSC-31-40-D-00020304.0001001 / 04 NOV 21
Applicable to: ALL

V1 INOP

Appears if the V1 signal is not valid.

Ident.: DSC-31-40-D-00020317.0001001 / 04 NOV 21
Applicable to: ALL

WINDSHEAR WARNING

Appears when windshear is detected (reactive windshear warning) by the FMGECs (flight envelope part). *Refer to DSC-22_40-60 Windshear Detection*.

Ident.: DSC-31-40-D-00020318.0001001 / 04 NOV 21
Applicable to: ALL

W/S AHEAD OR W/S AHEAD (PWS ◁) WARNING

Appears when the predictive windshear system has detected windshear ahead of the aircraft. The message is in amber or red, depending on the alert level.

Intentionally left blank

GENERAL

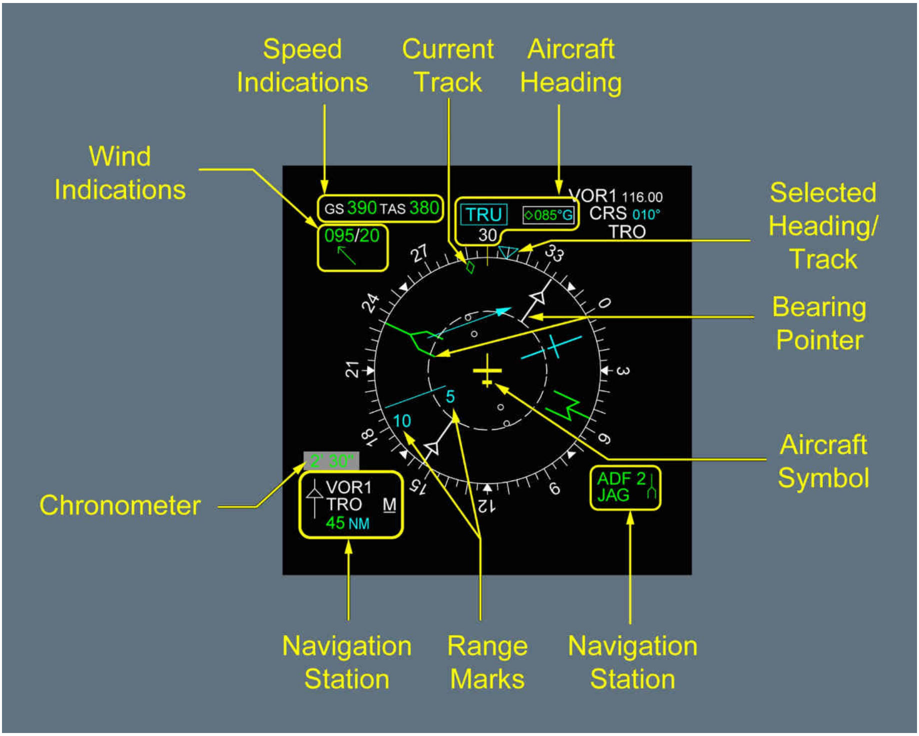
Ident.: DSC-31-45-00000719.0002001 / 21 MAR 16
Applicable to: ALL

There are six different displays (five display navigation information, and one displays primary engine parameters) :
- ROSE LS
- ROSE VOR
- ROSE NAV
- ARC
- PLAN
- ENG (standby page)

The Navigation Display (ND) can provide a weather radar image in all modes, except PLAN.

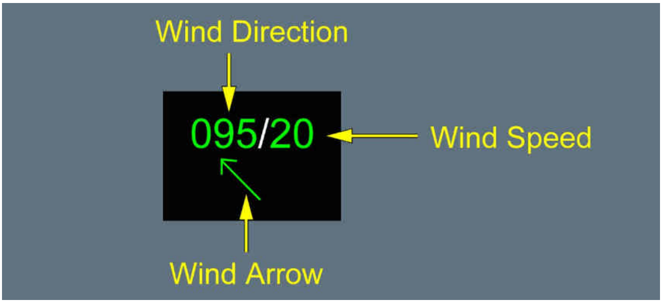
ROSE MODES

Ident.: DSC-31-45-00017884.0003001 / 02 JUN 20
Applicable to: ALL


Speed Indications
Current Track
Aircraft Heading
Wind Indications
Selected Heading/ Track
Bearing Pointer
Aircraft Symbol
Chronometer
Navigation Station
Range Marks
Navigation Station
GS 390 TAS 380
095/20
TRU
◇085°G
30
VOR1 116.00
CRS 010°
TRO
27
33
24
0
21
3
18
6
15
12
9
5
10
2' 30"
VOR1
TRO
M
45 NM
ADF 2
JAG

WIND INDICATIONS

The ADIRS provides the wind direction and speed.



The wind direction is in degrees, and wind speed is in knots. The numerical value of the wind direction is given relative to True North. The ND displays a green arrow when one of the following conditions occur:

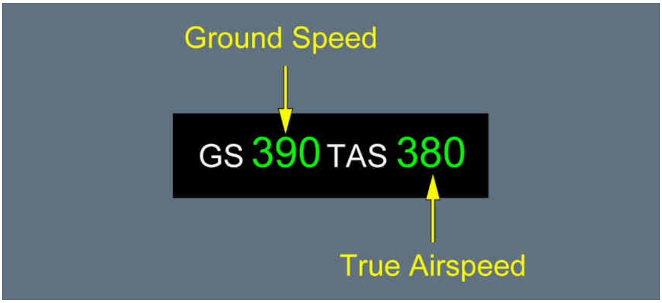
- Wind speed exceeds 2 kt, or
- TAS is above 100 kt.

The green arrow indicates the wind direction relative to Magnetic North.

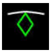
When wind data is not received, either wind speed or direction, dashes replace the numbers on the display.

SPEED INDICATION

The ADIRS provides the Ground Speed (GS) and True Airspeed (TAS) of the aircraft, in knots.

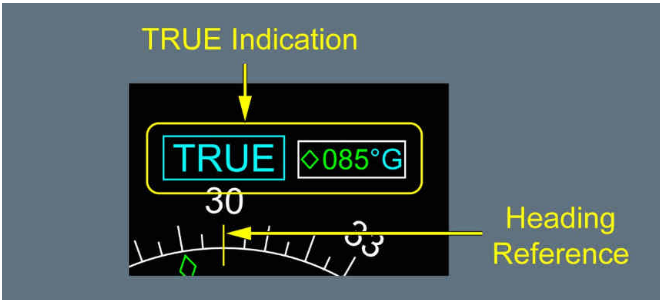


CURRENT TRACK

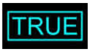


Indicates the current aircraft track.
The track refers to True North or Magnetic North, depending on the MAG/TRUE selection on NORTH REF pb-sw.

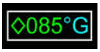
AIRCRAFT HEADING



TRUE INDICATION

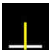


Indicates that the heading refers to the True North.
This indication flashes for 9 s, or until the slats are extended, then it remains steady.
Refer to DSC-22_20-60-130-Polar Navigation.



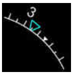
Appears when the heading refers to the True North, and the latitude is above 65 °N or 65 °S. This corresponds to the numerical form of the grid track.

HEADING REFERENCE



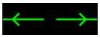
Indicates the current aircraft's heading on the moving white compass rose.
The heading refers to True North or Magnetic North, depending on the MAG/TRUE selection on NORTH REF pb-sw.

SELECTED HEADING/TRACK

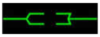


Indicates the heading (track) that the flight crew selects on the FCU. Appears when the HDG (TRACK) mode is engaged.

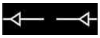
BEARING POINTER



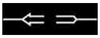
Indicates the bearing of the selected NDB1.
Appears when flight crew selects ADF1 ◁ on EFIS CP.



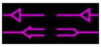
Indicates the bearing of the selected NDB2.
Appears when flight crew selects ADF2 ◁ on EFIS CP.



Indicates the bearing of the selected VOR1.
Appears when flight crew selects VOR1 on EFIS CP.



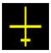
Indicates the bearing of the selected VOR2.
Appears when flight crew selects VOR2 on EFIS CP.



Appears when the ND display mode is ARC or ROSE NAV, and the computer detects a mismatch between the aircraft North reference and the VOR North reference.
In this case, the VOR raw bearing is corrected with magnetic variation at the aircraft present position (*Refer to DSC-22_20-60-130 General*).

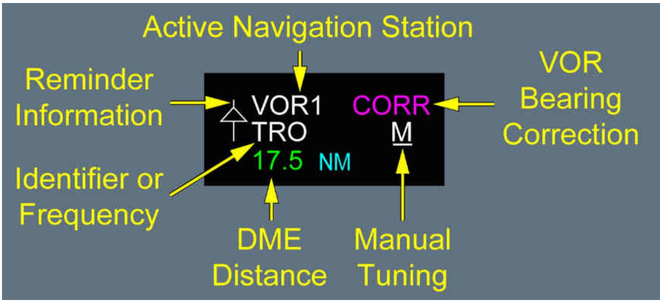
If reception of a beacon ceases, or if the receiver fails, the associated bearing pointer disappears.

AIRCRAFT SYMBOL



Fixed and centered in the display. The aircraft symbol points to the heading reference (yellow lubber line).

NAVIGATION STATION


Active Navigation Station
Reminder Information
VOR1
CORR
VOR Bearing Correction
TRO
M
Identifier or Frequency
17.5 NM
DME Distance
Manual Tuning

ACTIVE NAVIGATION STATION

VOR1

Indicates the VOR receiver currently displayed on the ND.
The flight crew can display the VOR1 or VOR2 via the EFIS CP (*Refer to DSC-31-50 EFIS Control Panel*).

ADF1

Indicates the ADF ◁ receiver currently displayed on the ND.
The flight crew can display the ADF1 ◁ or ADF2 ◁ via the EFIS CP (*Refer to DSC-31-50 EFIS Control Panel*).

IDENTIFIER OR FREQUENCY

TOU

Indicates the VOR ident.

If the VOR ident is not valid, the ND displays the following elements (if valid) instead, by order of priority:
- The DME ident, or
- The VOR frequency, or
- The DME frequency.

TOE	Indicates the NDB ident (ADF ◁). If the NDB ident (ADF ◁) is not valid, the ND displays the NDB frequency instead.

MANUAL TUNING

R	The flight crew manually tuned the navaids via the RMP.
M	The flight crew manually tuned the navaids via the MCDU.

When the navaid is automatically tuned by the FMGEC, no indication is displayed.

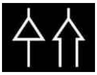
VOR BEARING CORRECTION

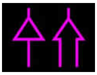
Indicates the VOR bearing correction, when the VOR reference from the FMGEC database (TRUE or MAG) is different from the current aircraft flying reference (TRUE or MAG).

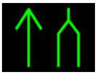
CORR	When in ROSE NAV or ARC mode, the VOR bearing is corrected for magnetic variation.
MAG	When in ROSE VOR or ROSE LS mode, the VOR reference is MAG. No correction is applied to bearing. *Refer to DSC-22_20-60-130 General*.
TRUE	When in ROSE VOR or ROSE LS mode, the VOR reference is TRUE. No correction is applied to bearing. *Refer to DSC-22_20-60-130 General*.

REMINDER INFORMATION

The reminder information enables to identify the pointer associated with a navaid currently displayed on the ND.


Indicates the pointer associated with the VOR1 or the VOR2.


Indicates, in ROSE NAV or ARC mode, when the VOR North reference (TRUE or MAG) is different from the current aircraft North reference (TRUE or MAG).


Indicates the pointer associated with the ADF1 ◁ or ADF2 ◁ .

DME DISTANCE

The DME distance only appears when the selected navaid is a VOR/DME.

17.5 NM	Indicates the DME distance of the aircraft. ADF ◁ identification and DME distance never appear at the same time.

The DME distance is not computed.

RANGE MARKS

Range value (10 to 320 NM) are displayed at a quarter and at a half of the selected range via EFIS CP.

CHRONOMETER

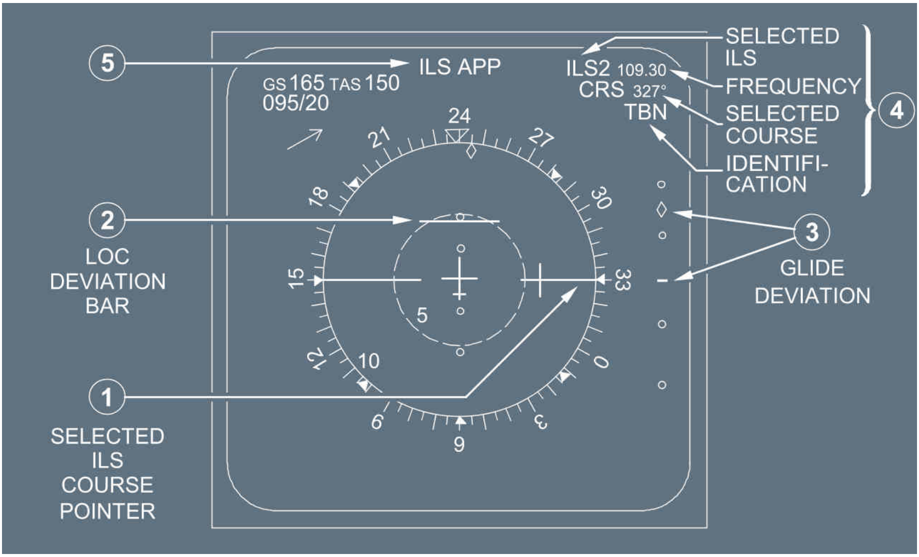
These numbers appear when the onside chronometer is started after the flight crew presses the onside CHRONO pb on the glareshield. For more information, *Refer to DSC-31-50 Chronometer (Glareshield)*.

Indicates the elapsed time in minutes and seconds (0 to 59 min 59 s).

Indicates the elapsed time in hours and minutes (1 h to 99 h 59 min).

ROSE LS MODE

Ident.: DSC-31-45-00000737.0001001 / 02 JUN 16
Applicable to: LV-GKO, LV-GKP


5
ILS APP
GS 165 TAS 150
095/20
ILS2 109.30
CRS 327°
TBN
SELECTED ILS FREQUENCY
SELECTED COURSE
IDENTIFI-CATION
4
24
21
27
18
30
15
33
12
0
9
6
3
10
5
2
LOC DEVIATION BAR
3
GLIDE DEVIATION
1
SELECTED ILS COURSE POINTER

(1) ILS Course Pointer (Magenta)

This symbol points at the selected ILS course.
The ILS course is either selected by the FMGC (autotuned or manually) or manually selected by the flight crew via the RMP backup mode.

(2) Localizer Deviation Bar (Magenta)

This bar moves laterally with respect to the course pointer. Its scale has two white dots on each side of the zero deviation. Each dot corresponds to a deviation of approximately ± 0.8 °.
If the lateral deviation exceeds 1/4 dot (0.2 °) above 15 ft RA, both the bar and the scale flash.

(3) Glide Deviation (Magenta)

This diamond moves on a vertical scale consisting of two white dots on each side of the yellow reference line. Each dot corresponds to deviation of approximately ± 0.4 °.
If the deviation exceeds one dot above 100 ft RA, both the scale and the diamond flash.

(4) Selected ILS Information

This area displays the ILS frequency (magenta), selected course (magenta), and identification (magenta).

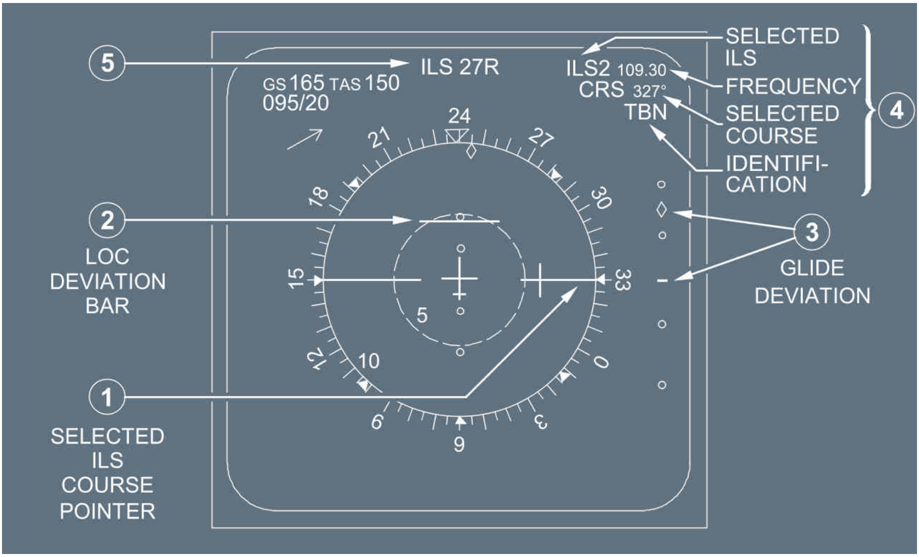
(5) ILS APP Message (Green)

This message appears when:
- The flight crew selects an ILS approach on the MCDU, and
- The FMS flight phase is DES, APPR, or GO-AROUND, or the FMS phase is CRZ and the along track distance to destination is less than 250 NM.

Note: *ILS 1 information appears on PFD 1 and ND 2.*
ILS 2 information appears on PFD 2 and ND 1.

ROSE LS MODE

Ident.: DSC-31-45-00000737.0003001 / 24 NOV 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


5
ILS 27R
GS 165 TAS 150
095/20
ILS2 109.30
CRS 327°
TBN
SELECTED ILS FREQUENCY
SELECTED COURSE
IDENTIFI-CATION
4
24
21
27
18
30
15
33
12
0
10
5
6
3
9
2
LOC DEVIATION BAR
3
GLIDE DEVIATION
1
SELECTED ILS COURSE POINTER

(1) ILS Course Pointer (Magenta)
This symbol points at the selected ILS course.
The ILS course is either selected by the FMGEC (autotuned or manually) or manually selected by the flight crew via the RMP backup mode.

(2) Localizer Deviation Bar (Magenta)
This bar moves laterally with respect to the course pointer. Its scale has two white dots on each side of the zero deviation. Each dot corresponds to a deviation of approximately ± 0.8 °.
If the lateral deviation exceeds 1/4 dot (0.2 °) above 15 ft RA, both the bar and the scale flash.

(3) Glide Deviation (Magenta)
This diamond moves on a vertical scale that has two white dots on each side of the yellow reference line. Each dot corresponds to a deviation of approximately ± 0.4 °.
If the deviation exceeds one dot above 100 ft RA, both the scale and the diamond flash.

(4) Selected ILS Information
This area displays the ILS frequency (magenta), selected course (magenta), and identification (magenta).

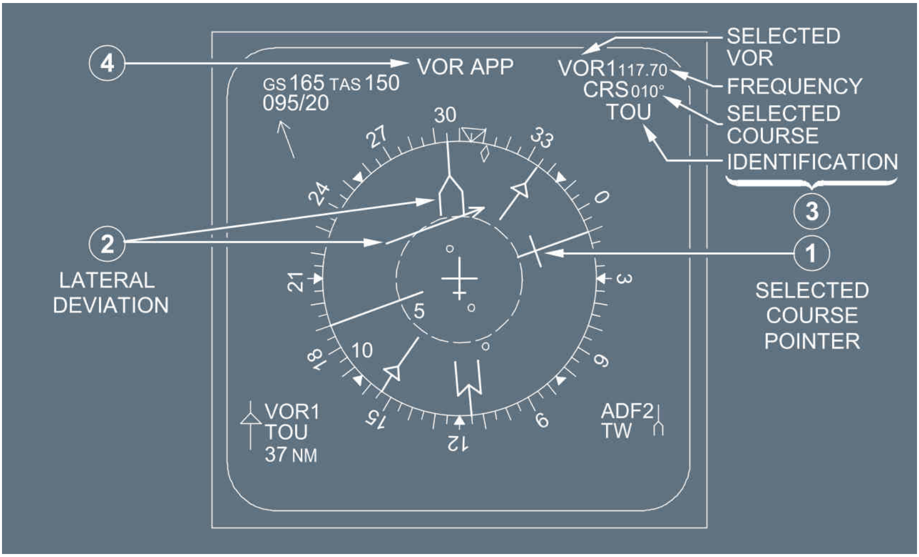
(5) ILS Message (Green)

This message indicates the full runway name of the selected approach. This message appears when:
- The flight crew selects an ILS approach on the MCDU, and
- The FMS flight phase is DES, APPR, or GO-AROUND, or the FMS phase is CRZ and the along track distance to destination is less than 250 NM.

Note: *ILS 1 information appears on PFD 1 and ND 2.*
ILS 2 information appears on PFD 2 and ND 1.

ROSE VOR MODE

Ident.: DSC-31-45-00000736.0001001 / 05 NOV 15
Applicable to: LV-GKO, LV-GKP


4
VOR APP
GS 165 TAS 150
095/20
VOR1 117.70
CRS 010°
TOU
SELECTED
VOR
FREQUENCY
SELECTED
COURSE
IDENTIFICATION
3
1
SELECTED
COURSE
POINTER
2
LATERAL
DEVIATION
30
27
33
24
0
21
3
18
6
15
12
9
5
10
VOR1
TOU
37 NM
ADF2
TW

(1) VOR Course Pointer (Cyan)
This symbol points at the selected VOR course.
The VOR course is either automatically selected by the FMGEC or manually selected by the flight crew via the MCDU pages or the RMP backup mode.

(2) Lateral Deviation Bar (Cyan)
This bar indicates the VOR deviation on a lateral scale.

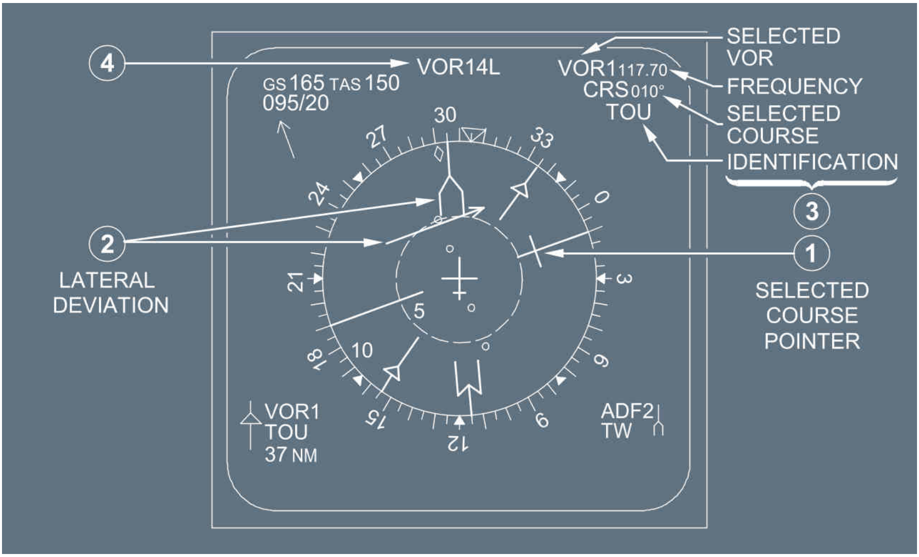
Each dot corresponds to 5 ° of lateral deviation. When the lateral deviation exceeds 10 °, the bar remains displayed on the outer dot.
The arrow on the bar provides the TO/FROM indication.

(3) VOR Information (White and cyan)
This area displays the frequency and identification (if decoded by the receiver) of the selected VOR in white, the selected course in cyan, and the tuning mode in white.

(4) VOR APP Message (Green)
This message appears when the flight crew selects a VOR approach on the MCDU.

ROSE VOR MODE

Ident.: DSC-31-45-00000736.0003001 / 05 NOV 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


4
VOR14L
GS 165 TAS 150
095/20
VOR1 117.70
CRS 010°
TOU
SELECTED VOR
FREQUENCY
SELECTED COURSE
IDENTIFICATION
3
30
27
33
24
0
21
3
18
6
15
12
9
10
5
2
LATERAL DEVIATION
1
SELECTED COURSE POINTER
VOR1
TOU
37 NM
ADF2
TW

(1) VOR Course Pointer (Cyan)
This symbol points at the selected VOR course.
The VOR course is either automatically selected by the FMGEC or manually selected by the flight crew via the MCDU pages or the RMP backup mode.

(2) Lateral Deviation Bar (Cyan)
This bar indicates the VOR deviation on a lateral scale.

Each dot corresponds to 5 ° of lateral deviation. When the lateral deviation exceeds 10 °, the bar remains displayed on the outer dot.
The arrow on the bar provides the TO/FROM indication.

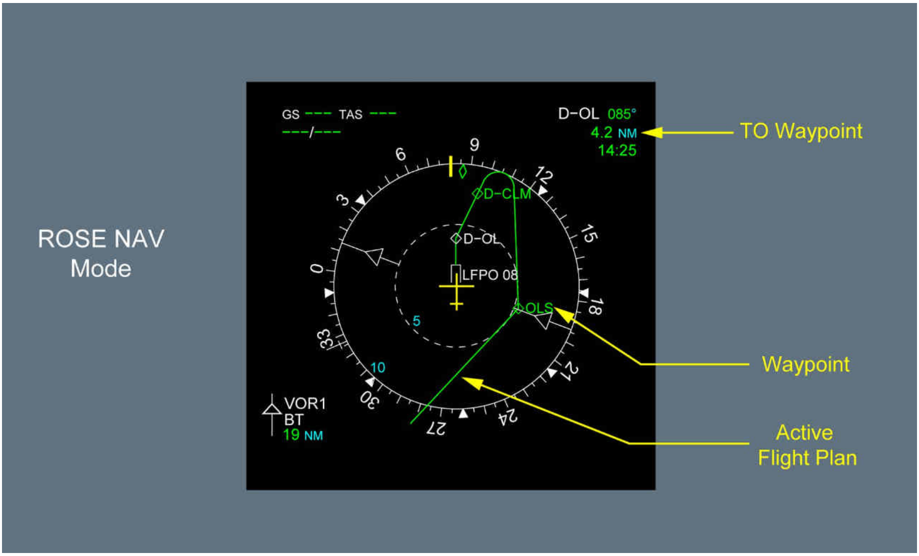
(3) VOR Information (White and cyan)
This area displays the frequency and identification (if decoded by the receiver) of the selected VOR in white, the selected course in cyan, and the tuning mode in white.

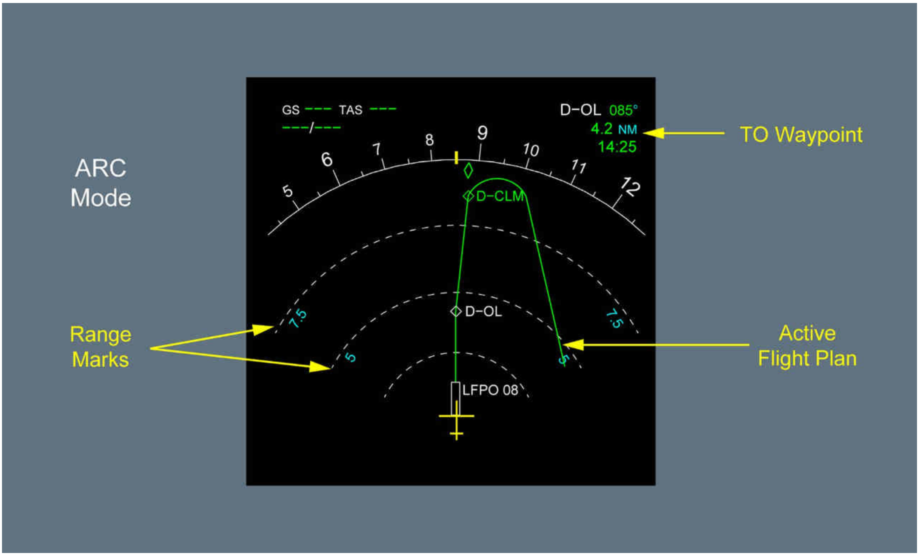
(4) VOR Message (Green)
This message indicates the full runway name of the selected approach. This message appears when the flight crew selects a VOR approach on the MCDU.

ROSE NAV MODE/ARC MODE

Ident.: DSC-31-45-B-00024241.0001001 / 28 MAY 20
Applicable to: ALL

ROSE NAV and ARC modes provide the same information to the flight crew, but ARC mode limits it to the forward 90 ° sector.


ROSE NAV
Mode
GS --- TAS ---
---/---
D-OL 085°
4.2 NM
14:25
TO Waypoint
6
9
12
3
15
0
18
33
21
30
27
24
D-CLM
D-OL
LFPO 08
OLS
5
10
Waypoint
Active
Flight Plan
VOR1
BT
19 NM


ARC
Mode
GS --- TAS ---
---/---
D-OL 085°
4.2 NM
14:25
TO Waypoint
5
6
7
8
9
10
11
12
D-CLM
7.5
7.5
D-OL
5
5
LFPO 08
Range
Marks
Active
Flight Plan

Ident.: DSC-31-45-B-00024242.0001001 / 28 MAY 20
Applicable to: ALL

RANGE MARKS AND VALUES

The values displayed on the ND are:

In ROSE NAV mode	1/4 of the selected range for the inner circle
	1/2 of the selected range for the heading scale circle
In ARC mode	1/4 of the selected range for the first inner arc
	1/2 of the selected range for the second inner arc
	3/4 of the selected range for the third inner arc

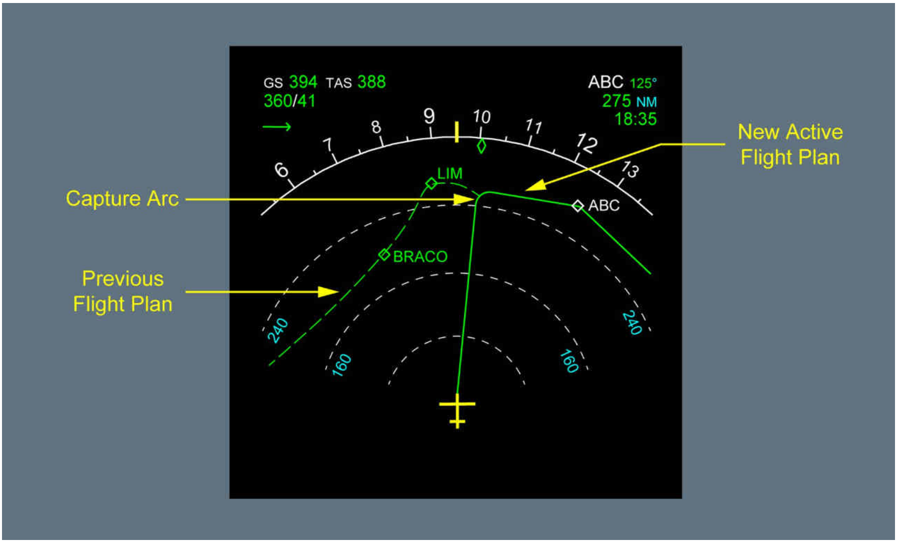
Ident.: DSC-31-45-B-00024243.0001001 / 28 MAY 20
Applicable to: ALL

FLIGHT PLAN

The flight crew can use the MCDU to select all of the following types of flight plan:

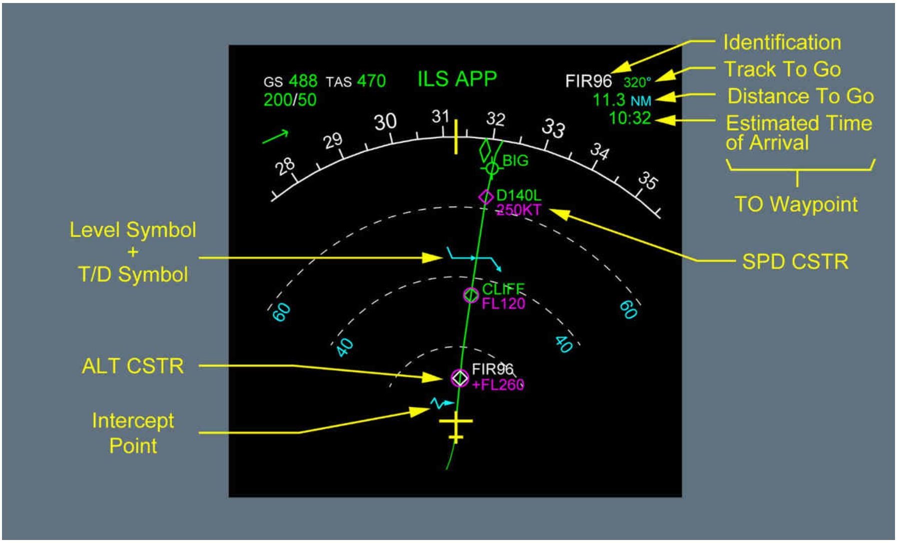
- The active flight plan (the flight plan the aircraft follows when the NAV mode is engaged) is indicated by a continuous green line. The ND indicates only the part of the flight plan that is ahead of the aircraft. In addition, the ND indicates the waypoints that are still to be overflown and the waypoint that the aircraft left from.
  The ND does not indicate a SID or a STAR, except for the last waypoint of the SID and the first waypoint of the STAR, when the selected range is 160 or 320 NM.
  If the primary flight plan is not active, it is indicated by a dotted green line.
- Missed approach procedure
  The missed approach procedure is indicated by a continuous blue line.
- Alternate
  The flight plan to the alternate is indicated by a dashed blue line.

  The missed approach and the alternate flight plan appear when:
  - In ARC or ROSE NAV mode, a missed approach waypoint or an alternate flight plan waypoint is displayed on the onside MCDU
  - In PLAN mode, a missed approach or alternate waypoint is displayed in the 2L field of the onside MCDU.
- The secondary flight plan
  The ND continues to display the active flight plan. The secondary flight plan is indicated by a continuous white line.
- Temporary flight plan
  The revised portion of the flight plan is indicated by a dotted yellow line.
- Flight plan capture
  When the aircraft is off the primary flight plan and flies toward it in HDG mode with the NAV mode armed, the ND indicates the new active flight plan as a continuous green line, if the FMGEC computed the intercept path.
  The part of the flight plan before the interception point is indicated as a dotted green line.


GS 394 TAS 388
360/41
ABC 125°
275 NM
18:35
6
7
8
9
10
11
12
13
LIM
ABC
BRACO
240
160
240
160
New Active Flight Plan
Capture Arc
Previous Flight Plan

Ident.: DSC-31-45-B-00024244.0001001 / 28 MAY 20
Applicable to: ALL

WAYPOINT


GS 488 TAS 470
200/50
ILS APP
FIR96 320°
11.3 NM
10:32
28
29
30
31
32
33
34
35
BIG
D140L
250KT
CLIFF
FL120
FIR96
+FL260
60
40
60
40
Identification
Track To Go
Distance To Go
Estimated Time of Arrival
TO Waypoint
SPD CSTR
Level Symbol + T/D Symbol
ALT CSTR
Intercept Point

The ND can display all of the following types of waypoints:

- Flight plan waypoints
  The ND displays these as green diamonds (white, for TO waypoints). When the flight crew selects the WPT option on his EFIS control panel, all waypoints other than flight plan waypoints are displayed in magenta.
- Pseudo waypoint
  Point of the flight path where the aircraft is predicted to reach a selected altitude or speed (*Refer to DSC-22_20-40-30 Predictions Displayed on the Navigation Display*).
- Constraint values
  When the flight crew presses the CSTR pb on the EFIS CP, the ND displays the constraints values below the waypoint ident.

  If there are several constraints for the same waypoint, the ND displays the constraints in the following order of priority:
  - The altitude constraint

    The ND displays the altitude constraint value:
    - In FL, when the altitude is above the transition altitude or the barometric setting is set to STD
    - In feet in all other cases.
  - The speed constraint
    The ND displays the speed constraint value in knots or as a Mach number.
  - The time constraint.

  Note: *1. For ILS approaches, the ND only displays speed and time constraints at the FAF waypoint up to destination.*
  2. The ND is limited to the display of 3 lines of constraints for each waypoint. Therefore immediately after the fourth constraint is applied on the FMS:
  - With FMS Thales, the fourth constraint is not displayed on ND
  - With FMS Honeywell, the waypoint ID and all associated constraints disappear from the ND.
  In both cases, all constraints are correctly managed by the FMS. The flight crew can refer to the MCDU F-PLN page to check all constraints associated with a waypoint.

  The constraint value and the constraint symbol have identical color coding.

  Note: *In PLAN mode, and at the MRP waypoint, the ND also displays the track and the distance to the next waypoint.*

Ident.: DSC-31-45-B-00024245.0001001 / 28 MAY 20
Applicable to: ALL

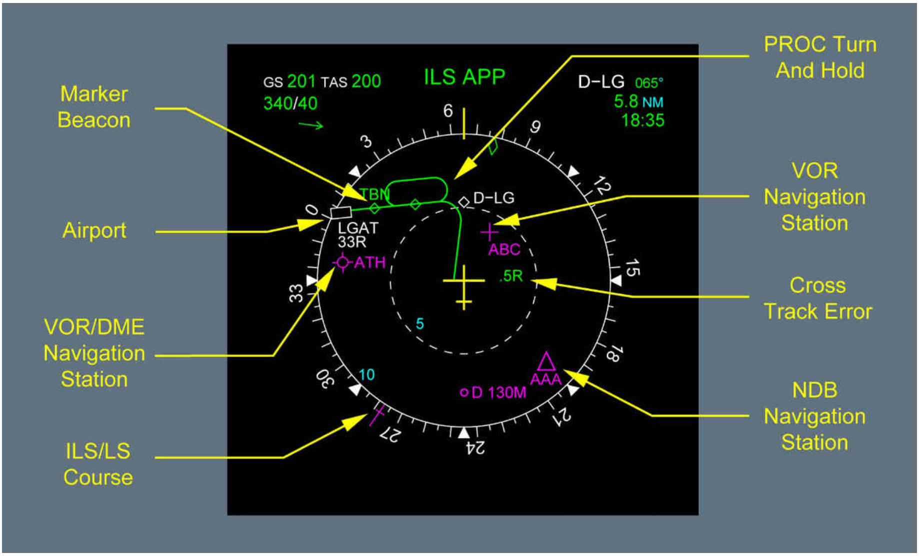
TO WAYPOINT

This is the next waypoint that the aircraft will overfly.

L2 With the FMS standard Release 1A, when a DIR TO with ABEAM PTS is performed, the DIR TO waypoint appears on the top of the screen, instead of the NEXT ABEAM waypoint.

L1 This area of the screen also indicates all of the following:
- Waypoint identification
- Track to go
- Distance to go
- Estimated time of arrival, with the assumption that the aircraft will directly fly from its present position to the TO waypoint at the current ground speed.

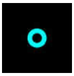
Ident.: DSC-31-45-B-00024246.0001001 / 28 MAY 20
Applicable to: ALL

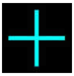

Marker Beacon
Airport
VOR/DME Navigation Station
ILS/LS Course
PROC Turn And Hold
VOR Navigation Station
Cross Track Error
NDB Navigation Station
GS 201 TAS 200
340/40
ILS APP
D-LG 065°
5.8 NM
18:35
TBN
D-LG
LGAT
33R
ATH
ABC
.5R
5
10
D 130M
AAA
6
3
9
12
0
15
33
18
30
21
27
24

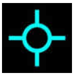
Ident.: DSC-31-45-B-00024247.0001001 / 28 MAY 20
Applicable to: ALL

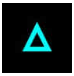
NAVAIDS

The display uses all of the following specific symbols for NAVAIDs:


DME or TACAN


VOR


VOR/DME


NDB

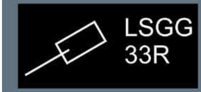
The symbol can appear in all of the four following colors:
- In green if the NAVAID is a current waypoint of the flight plan
- In white if it is the TO waypoint
- In blue when the NAVAID is tuned for display, either automatically by the FMGEC, or manually via the MCDU
- In magenta when the NAVAID is not part of the flight plan and is displayed as an option (corresponding option pushbutton pressed on the FCU EFIS control panel).

Ident.: DSC-31-45-B-00024248.0001001 / 28 MAY 20
Applicable to: ALL

AIRPORT

Airport included in the flight plan:

- If the runway is not specified, the airport is indicated by a star and the identification is displayed in white
- If the runway is specified, it is indicated by an oriented runway symbol in white.



The runway is drawn to scale (paved length) if the selected range is 10, 20 or 40 NM.

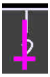
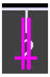
Optional airport information

The airports that are not displayed as part of the flight plan may be displayed (ARPT pb on the EFIS control panel).
They are indicated by a star and the identification in magenta.

Ident.: DSC-31-45-B-00024249.0001001 / 28 MAY 20
Applicable to: ALL

ILS/LS COURSE

When the pilot pushes the ILS/LS pb on the EFIS control panel, and if an ILS/GLS ⊲ /FLS ⊲ /MLS ⊲ approach is selected, the display shows an ILS/LS course symbol:

	If an ILS/GLS ⊲ /MLS ⊲ or LOC approach is selected
	If an NPA approach with the FLS ⊲ for lateral guidance is selected.

Ident.: DSC-31-45-B-00024251.0001001 / 28 MAY 20
Applicable to: ALL

ILS/GLS ⊲ MARKER BEACONS

The screen indicates these as waypoints (diamonds).

When the aircraft overflies a marker beacon, the corresponding symbol flashes:

OM	The aircraft is over the outer marker
MM	The aircraft is over the middle marker
IM	The aircraft is over the inner marker.

Ident.: DSC-31-45-B-00024252.0002001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

CROSS TRACK ERROR

This is the lateral deviation of the aircraft from the active leg of the flight plan (related to the great circle route). It is indicated in nautical miles (NM), with the letter R (right) or L (left), according to the position of the aircraft compared to the flight plan.

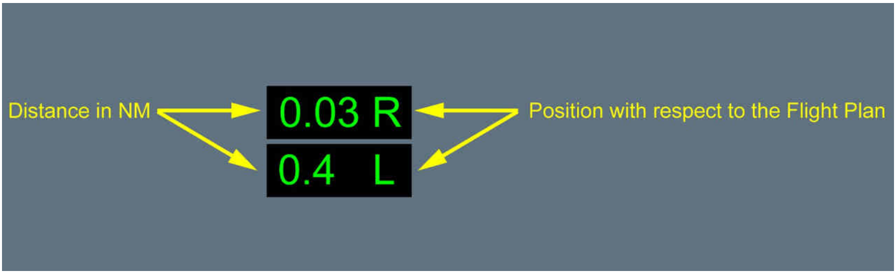
Ident.: DSC-31-45-B-00024252.0001001 / 05 MAY 23
Applicable to: LV-KAN, LV-KAO

CROSS TRACK ERROR

This is the lateral deviation of the aircraft from the active leg of the flight plan (related to the great circle route). It is indicated in nautical miles (NM), with the letter R (right) or L (left), according to the position of the aircraft compared to the flight plan.

The following are the conditions of display:

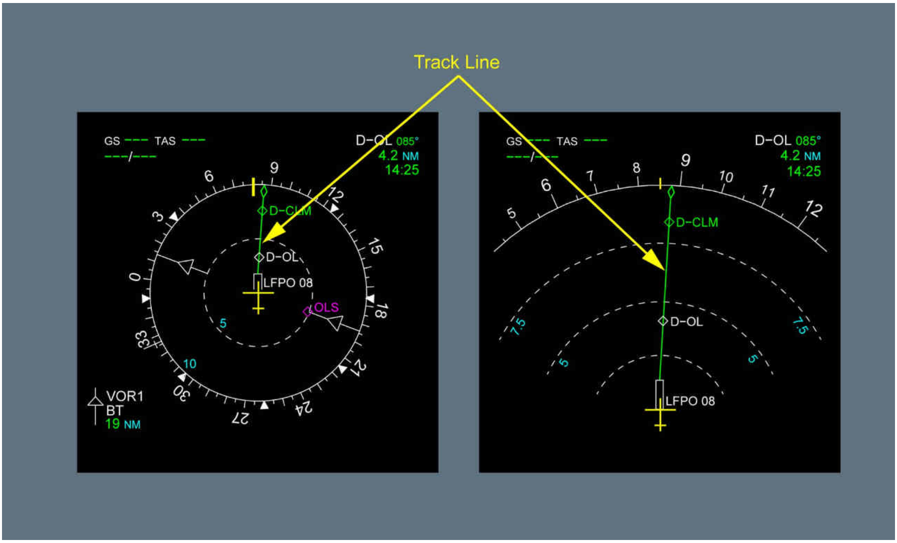
- When the current RNP is equal or below 0.3 NM:
  1. The cross-track error is displayed with a precision of one digit (0.1 NM), when the cross-track error is strictly more than 0.29 NM
  2. The cross-track error is displayed with a precision of two digits (0.01 NM), from 0.02 NM to 0.29 NM
  3. When displayed, the cross-track error is removed when it is becomes less than 0.01 NM.
- When the current RNP is strictly above 0.3 NM:
  1. The cross-track error is displayed with a precision of one digit (0.1 NM)
  2. When displayed, the cross-track error is removed when it becomes less than 0.01 NM.



Ident.: DSC-31-45-B-00024253.0001001 / 28 MAY 20
Applicable to: ALL

TRACK LINE

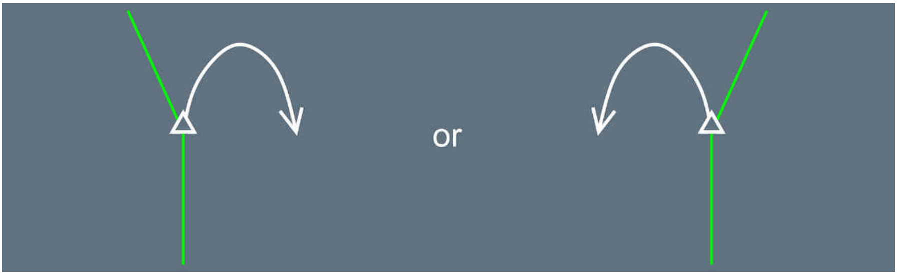
This line appears in green only in the ROSE NAV or ARC mode when HDG or TRK is selected on the FCU.


Track Line
GS --- TAS ---
---/---
D-OL 085°
4.2 NM
14:25
D-CLM
D-OL
LFPO 08
OLS
VOR1
BT
19 NM
7.5
5
10

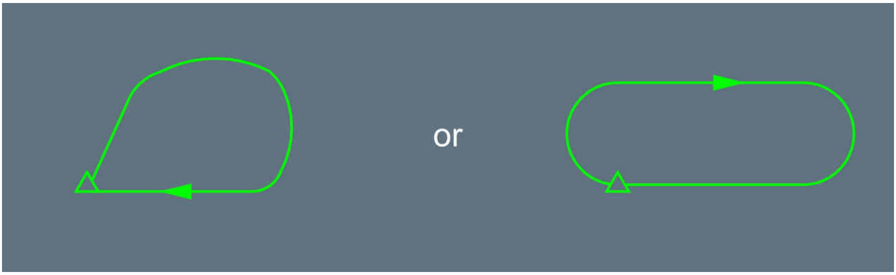
Ident.: DSC-31-45-B-00024254.0001001 / 28 MAY 20
Applicable to: ALL

PROCEDURE TURNS AND HOLDING PATTERNS

These only appear when they are part of the flight plan. For the 160 and 320 NM range scales, each one is indicated by a white arrow that originates at the associated fix and indicates the direction of the turn.



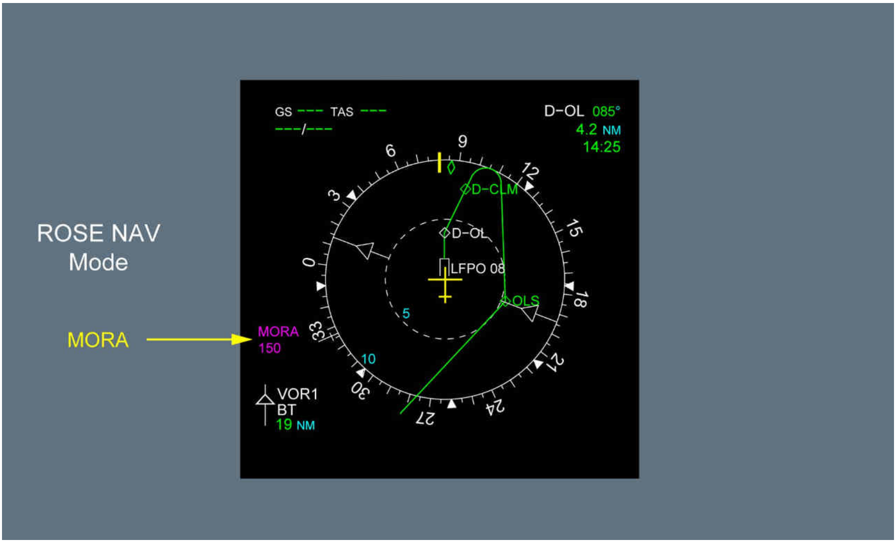
For shorter range scales, and if the procedure turn or the holding pattern is in the next or the active leg, the display indicates the full circuit or pattern.

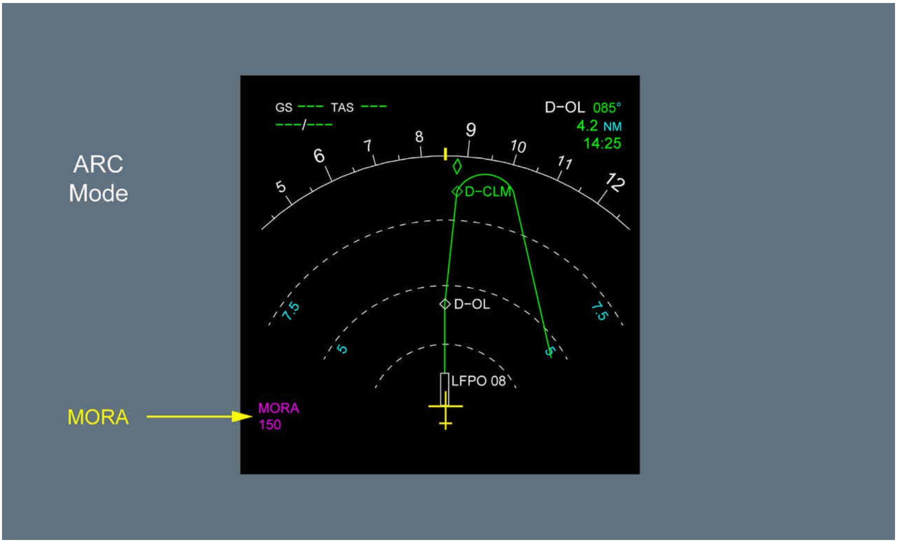


Ident.: DSC-31-45-B-00024255.0002001 / 28 MAY 20
Applicable to: ALL

MINIMUM OFF ROUTE ALTITUDE (MORA)

Provided that CSTR is selected and range is selected equal to or above 40 NM, a digital readout (Flight Level) is displayed. This Flight Level indicates the Minimum Off Route Altitude (MORA) permitted, within a circular area centered on the present aircraft position and bounded by 40 NM of radius limit. If the MORA is not available in the FMGES database for the chosen flight route, nothing is displayed.

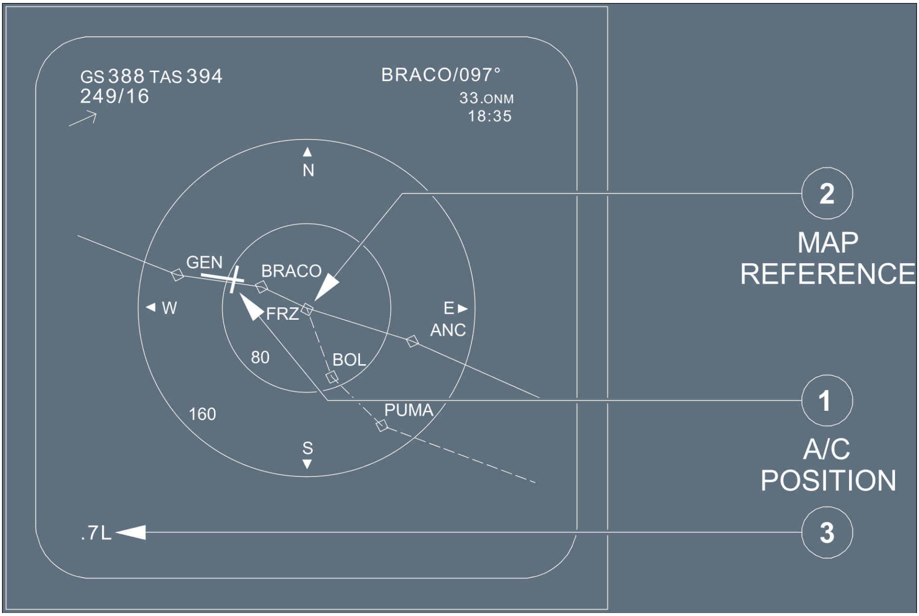

ROSE NAV
Mode
MORA
GS --- TAS ---
---/---
D-OL 085°
4.2 NM
14:25
D-CLM
D-OL
LFPO 08
OLS
5
10
MORA
150
VOR1
BT
19 NM
0
3
6
9
12
15
18
21
24
27
30
33



PLAN MODE

Ident.: DSC-31-45-00000744.0001001 / 03 JUN 20
Applicable to: ALL

This mode statically displays the flight plan legs on a map oriented to true north. The map is centered on a map reference point that the pilot selects by slewing to it on his MCDU.
The map reference point is the waypoint displayed on the second line of the MCDU F-PLN page. It can either be the active waypoint (next waypoint to be overflown), or any other waypoint of the flight plan.
The pilot can slew the overall flight plan and display it in PLAN mode.
The pilot chooses the scale of the map with the range selector. (The diameter of the outer circle corresponds to the selected range).
Data on navaids, and their characteristics and associated bearing pointers, are not available in this mode.


GS 388 TAS 394
249/16
BRACO/097°
33.0NM
18:35
N
GEN
BRACO
W
FRZ
E
ANC
80
BOL
160
PUMA
S
.7L
2
MAP REFERENCE
1
A/C POSITION
3

(1) Aircraft Position and True Track
The orientation of the yellow aircraft symbol always indicates the aircraft's true track. Its position represents the aircraft position given by the FMGS.

(2) Map Reference Point

(3) Crosstrack Error
Refer to DSC-31-45 Cross Track Error.

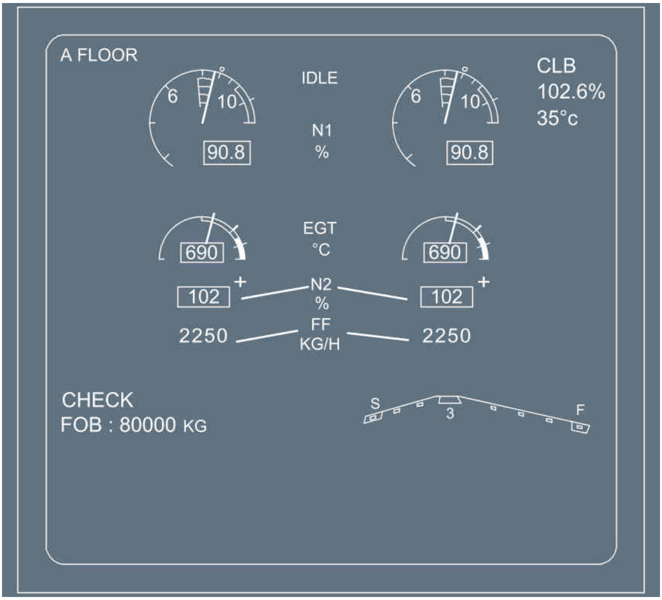
WEATHER RADAR INDICATION

Ident.: DSC-31-45-00015254.0001001 / 26 NOV 19
Applicable to: ALL

Refer to DSC-34-20-30-30 Weather Radar indication on ND

ENGINE STANDBY PAGE

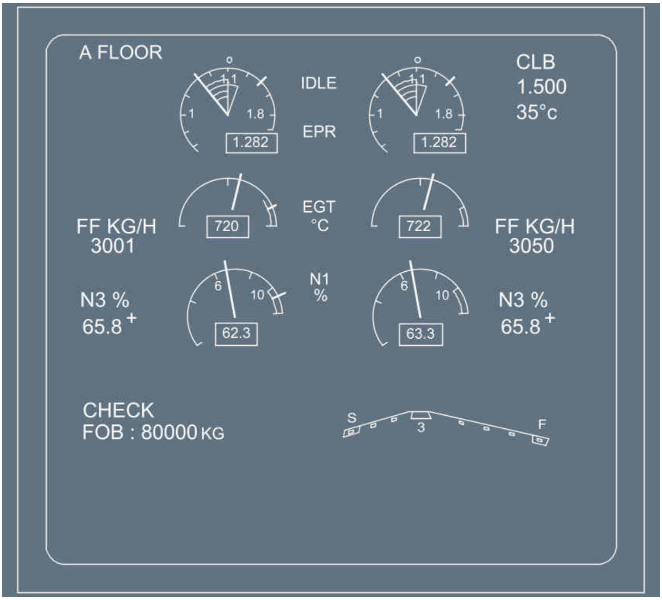
Ident.: DSC-31-45-00000747.0006001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


A FLOOR
IDLE
6
10
90.8
N1
%
6
10
90.8
CLB
102.6%
35°c
690
EGT
°C
690
102
N2
%
102
2250
FF
KG/H
2250
CHECK
FOB : 80000 KG
S
3
F

Each pilot may display the engine standby page on their respective ND via the ND selector on the EFIS control panel.
The displayed information is N1, N2, EGT, FF, FOB, slats/flaps position, alpha floor, idle message and limit modes (same presentation as the upper part of the primary engine page).
For more information on this page, refer to the POWERPLANT Chapter (*Refer to DSC-70-90-40 Engine/Warning Display*).

ENGINE STANDBY PAGE

Ident.: DSC-31-45-00000747.0010001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

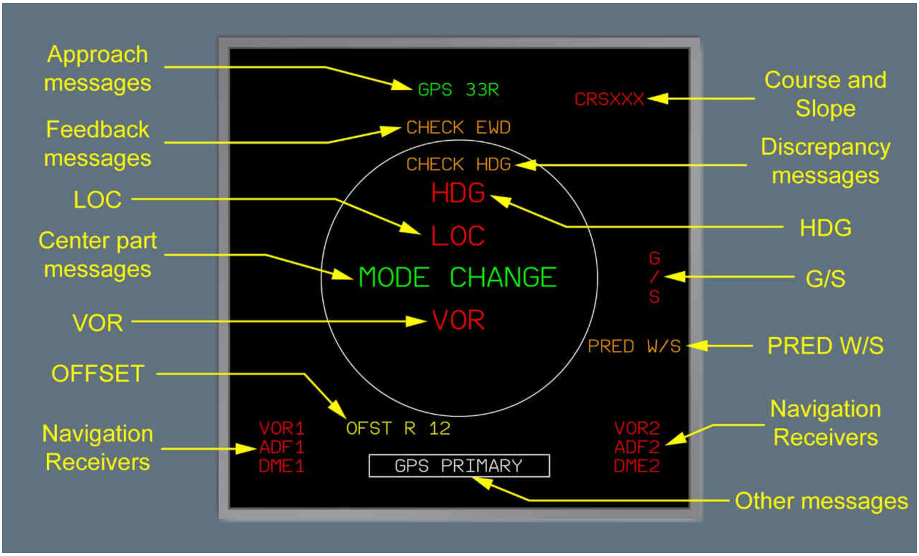

A FLOOR
IDLE
EPR
1
1.1
1.8
1.282
1
1.1
1.8
1.282
CLB
1.500
35°c
EGT
°C
FF KG/H
3001
720
722
FF KG/H
3050
N1
%
N3 %
65.8 +
6
10
62.3
6
10
63.3
N3 %
65.8 +
CHECK
FOB : 80000 KG
S
3
F

Each pilot may display the engine standby page on their respective ND via the ND selector on the EFIS control panel.
The displayed information is N1, N3, EPR, EGT, FF, alpha floor, fuel on board, slats/flaps position, idle message and limit modes (same presentation as the upper part of the primary engine page).
For more information on this page, refer to the POWERPLANT Chapter (*Refer to DSC-70-90-40 Engine/Warning Display*).

FLAGS AND MESSAGES DISPLAYED ON ND

Applicable to: ALL

Ident.: DSC-31-45-A-00024128.0001001 / 28 MAY 20


Approach messages
Feedback messages
LOC
Center part messages
VOR
OFFSET
Navigation Receivers
GPS 33R
CHECK EWD
CHECK HDG
HDG
LOC
MODE CHANGE
VOR
OFST R 12
VOR1
ADF1
DME1
GPS PRIMARY
CRSXXX
G/S
PRED W/S
VOR2
ADF2
DME2
Course and Slope
Discrepancy messages
HDG
G/S
PRED W/S
Navigation Receivers
Other messages

Ident.: DSC-31-45-A-00024141.0001001 / 28 MAY 20

APPROACH MESSAGES

This message shows the full runway name of the selected approach.

Ident.: DSC-31-45-A-00024142.0001001 / 28 MAY 20

FEEDBACK MESSAGES

Refer to DSC-31-05-60 Messages on the Display Units (DUs) - Feedback Messages

Ident.: DSC-31-45-A-00024133.0001001 / 28 MAY 20

LOC OR F-LOC (FLS ◁)

If LOC or F-LOC (FLS ◁) data fails, this flag flashes for 9 s, then remains steady.
If there is an inconsistency in the approach mode selection within one MMR, both LOC and F-LOC (FLS ◁) flags flash for 9 s, then remain steady.

Ident.: DSC-31-45-A-00024132.0001001 / 28 MAY 20

CENTER PART MESSAGES

MODE CHANGE	Appears if there is a discrepancy between the selected mode on the EFIS control panel and the mode sent from the onside FMGEC, or while the DMC is preparing a new page for display.
RANGE CHANGE	Appears if there is a discrepancy between the range selected on the EFIS control panel and the range sent from the onside FMGEC. A MODE CHANGE message has priority over a RANGE CHANGE message.
MAP NOT AVAIL	Appears when one of the following occurs: • The MODE CHANGE or RANGE CHANGE message appears for more than 6 s, or • The FMGEC has failed, or • The FMGEC has delivered an invalid aircraft position.
W/S SET RNG 10 NM (PWS ◁)	Appears if a predictive windshear warning alert is triggered and the range is above 10 NM.
W/S SET RNG 10 NM (PWS ◁)	Appears if a predictive windshear caution alert is triggered and the range is above 10 NM.
W/S CHANGE MODE (PWS ◁)	Appears if a predictive windshear warning alert is triggered and the ND is not in ARC or ROSE mode.
W/S CHANGE MODE (PWS ◁)	Appears if a predictive windshear caution alert is triggered and the ND is not in ARC or ROSE mode.
TCAS Message	*Refer to DSC-34-20-60-20 Messages on ND*

Ident.: DSC-31-45-A-00024135.0001001 / 28 MAY 20

VOR

In ROSE VOR mode, when the VOR bearing is not valid, this flag flashes for 9 s, then remains steady.

Ident.: DSC-31-45-A-00024139.0001001 / 28 MAY 20

OFFSET MESSAGE

OFST R(L) XX	Appears when the flight crew prepares an offset or if an offset is selected. The offset value is provided in NM.

Ident.: DSC-31-45-A-00024136.0001001 / 28 MAY 20

NAVIGATION RECEIVERS

VOR 1	Appears if the VOR 1(2) fails. The associated flag flashes for 9 s, then remains steady.
ADF 1	Appears if the ADF 1(2) fails. The associated flag flashes for 9 s, then remains steady.
DME 1	Appears if the DME 1(2) fails. The associated flag flashes for 9 s, then remains steady.

Ident.: DSC-31-45-A-00024137.0001001 / 28 MAY 20

COURSE AND SLOPE INDICATION

CRSXXX	Appears if the VOR/ FLS /ILS course fails.
CRS---	Appears if there is non-computed data for the VOR/ FLS /ILS course.
XX	Appears if the FLS slope is invalid.
--	Appears if there is non-computed data for the FLS slope.

Ident.: DSC-31-45-A-00024131.0001001 / 28 MAY 20

DISCREPANCY MESSAGES

Refer to DSC-31-05-60 Messages on the Display Units (DUs) - Side1/Side2 Discrepancy Messages

Ident.: DSC-31-45-A-00024130.0001001 / 28 MAY 20

HDG

If the heading data fails, the ROSE, ARC and associated symbols disappear.
A HDG flag flashes for 9 s, then remains steady.

Ident.: DSC-31-45-A-00024134.0001001 / 28 MAY 20

G/S OR F-G/S (FLS)

If G/S or F-G/S (FLS) data fails, this flag flashes for 9 s, then remains steady.
If there is an inconsistency in the approach mode selection within one MMR, both G/S and F-G/S (FLS) flags flash for 9 s, then remain steady.

Ident.: DSC-31-45-A-00024140.0001001 / 28 MAY 20

PRED W/S (PWS)

Appears if the WINDSHEAR sw (PWS) on the weather radar panel is set to AUTO, and a PWS fault is detected. This message appears on ground, or when flaps and slats are extended.

It is associated with a single chime. The radar image remains available, provided that the fault does not affect the radar mode.

Ident.: DSC-31-45-A-00024138.0001001 / 04 NOV 20

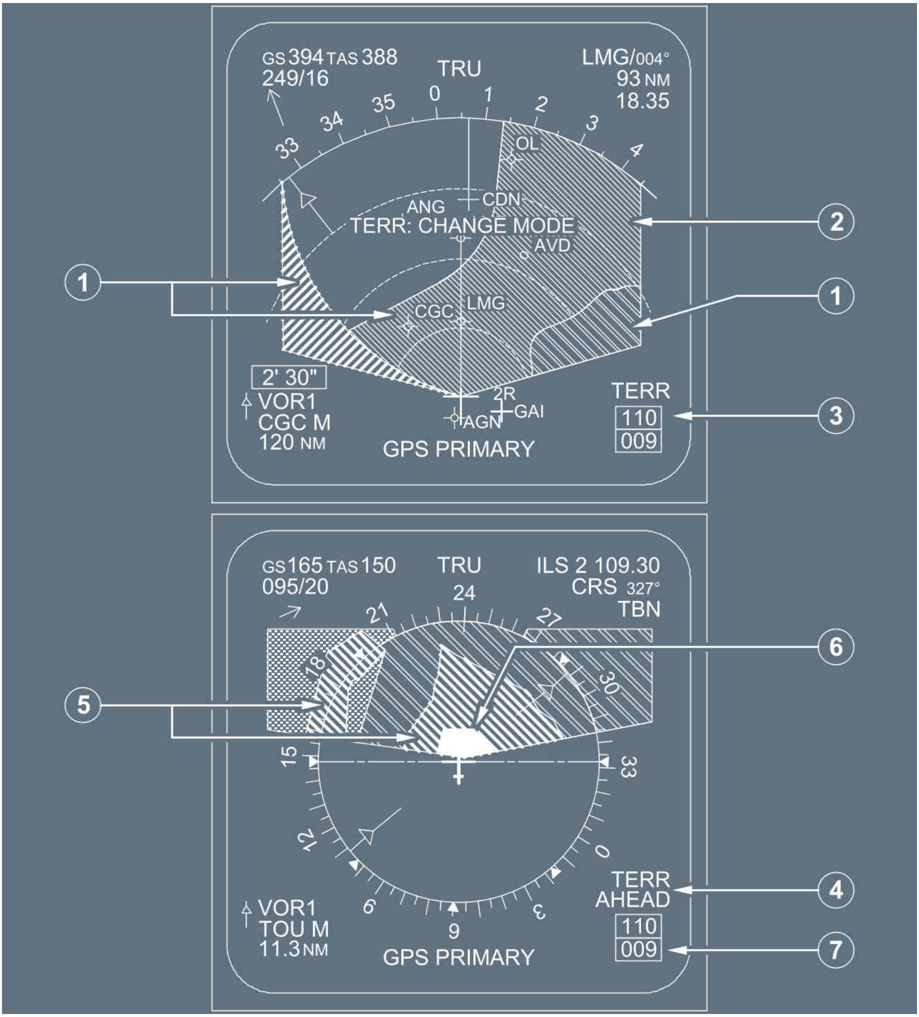
OTHER MESSAGES

↓	Overflow arrow, displayed when more than one of the other messages are present at the same time.
BACK UP NAV ◁	Appears when the MCDU backup navigation mode is activated (*Refer to DSC-22_10-30 Back Up Navigation Mode*).
CHECK NORTH REF	Appears when the NORTH REF pb selection does not match the airport MAG/TRUE bearing reference (as stored in the FMGEC navigation database), either at the departure airport (during preflight), or at the destination airport (when entering the ARRIVAL area).
CHK FLT PLN POSITION	Appears when the DMC detects a disagreement between the acquisition and the display of the flight plan when on ARC or ROSE NAV mode.
GPS PRIMARY ◁	Appears when GPS PRIMARY mode is available, or has been recovered. The flight crew can clear this message by pressing the CLR key on the MCDU.
GPS PRIMARY LOST ◁	Appears when GPS PRIMARY is not available, and not clearable by flight crew action.
MAP PARTLY DISPLAYED	Appears when there is an incomplete data transmission between the FMGEC and the DMC, or if the DMC cannot draw the complete MAP.
NAV ACCUR UPGRAD or NAV ACCUR DOWNGRAD	Appears when there is a change in navigation accuracy.
OFF SIDE FM CONTROL	Appears when the offside FMGEC supplies the onside ND.
RTA MISSED ◁	Appears when a time constraint is defined in the active flight plan and this time constraint is predicted as "missed" by the FMGEC.
SELECT TRUE REF	Appears when entering the polar area, if the TRUE North reference is not selected by the flight crew (MAG/TRUE pb).

SPECIFIC VOR/D UNAVAIL	Appears when the NAVAID, that is tuned for the selected approach or departure, is not available.
TCAS Operating Messages	*Refer to DSC-34-20-60-20 Messages on ND*

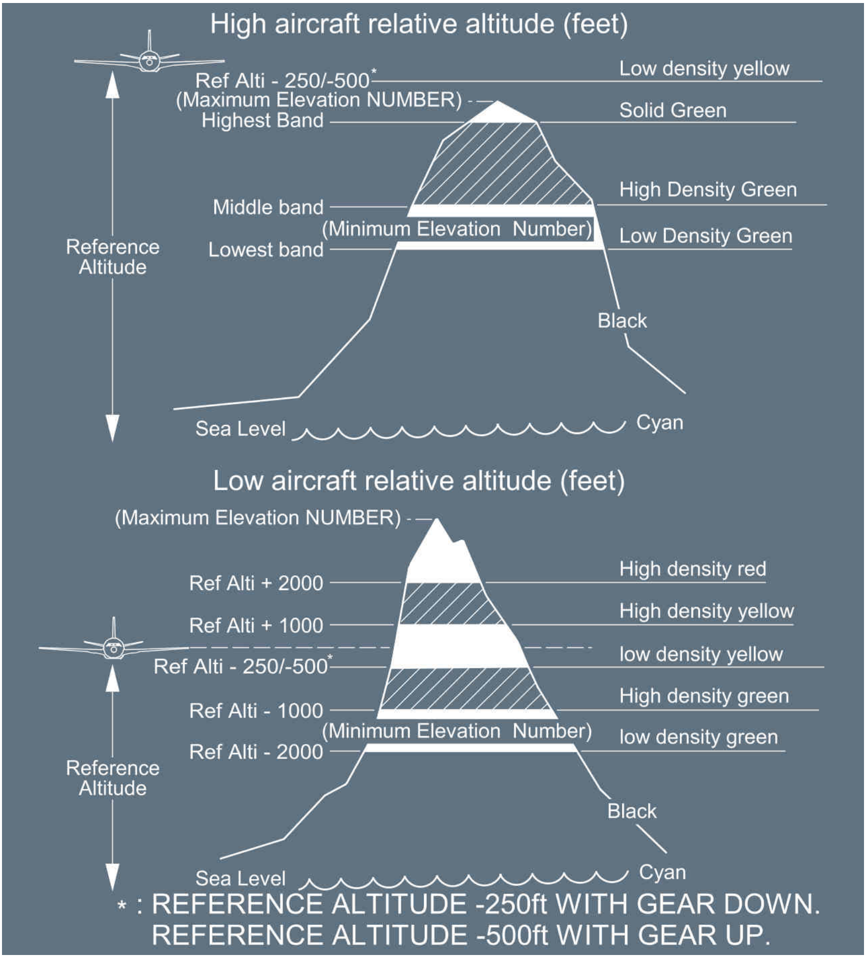
EGPWS

Ident.: DSC-31-45-00009015.0092001 / 09 OCT 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO


GS 394 TAS 388
249/16
TRU
LMG/004°
93 NM
18.35
33
34
35
0
1
2
3
4
OL
ANG
CDN
TERR: CHANGE MODE
AVD
CGC
LMG
2' 30"
VOR1
CGC M
120 NM
2R
GAI
AGN
GPS PRIMARY
TERR
110
009
①
②
①
③
GS 165 TAS 150
095/20
TRU
24
ILS 2 109.30
CRS 327°
TBN
21
27
18
30
15
33
12
0
6
9
3
VOR1
TOU M
11.3 NM
GPS PRIMARY
TERR
AHEAD
110
009
⑤
⑥
④
⑦

(1) EGPWS terrain picture

The ND displays the EGPWS terrain picture, when the TERR ON ND switch is selected ON, and the ND is not in PLAN or ENG mode. The terrain picture replaces the weather radar image. Terrain data is displayed independently of the aircraft relative altitude. The terrain appears in different colors and densities, according to its relative height:


High aircraft relative altitude (feet)
Ref Alti - 250/-500*
(Maximum Elevation NUMBER)
Highest Band
Middle band
(Minimum Elevation Number)
Lowest band
Reference Altitude
Low density yellow
Solid Green
High Density Green
Low Density Green
Black
Sea Level
Cyan
Low aircraft relative altitude (feet)
(Maximum Elevation NUMBER)
Ref Alti + 2000
Ref Alti + 1000
Ref Alti - 250/-500*
Ref Alti - 1000
(Minimum Elevation Number)
Ref Alti - 2000
Reference Altitude
High density red
High density yellow
low density yellow
High density green
low density green
Black
Sea Level
Cyan
* : REFERENCE ALTITUDE -250ft WITH GEAR DOWN.
REFERENCE ALTITUDE -500ft WITH GEAR UP.

Note:
- *Areas without available terrain data in the EGPWS database appear in magenta.*
- *The reference altitude is computed based on the current aircraft altitude or, if descending more than 1 000 ft/min, the altitude expected in 30 s.*
- *In case of flight above the maximum elevation number the relief between the minimum and maximum displayed elevations is displayed by using three different green levels.*

(2) Center Part Messages

- The “TERR CHANGE MODE” indication is displayed in red (or amber), in the case of a Terrain Awareness Display (TAD) warning (or caution) alert, if the current selected display mode is PLAN.
- The “TERR REDUCE RANGE” indication is displayed in red (or amber), in the case of a Terrain Awareness Display (TAD) warning (or caution) alert, if the selected range is 160 NM or 320 NM.

(3) TERR indication

To differentiate between the terrain and the weather display, the weather radar TILT is replaced by a blue TERR, and the terrain display sweeps from the center outward to both ND sides.

(4) Warning and caution messages

TERR AHEAD/OBST AHEAD (amber) : For a caution

TERR AHEAD/OBST AHEAD (red) : For a warning.

When triggered, these messages flash for 9 s, then remain steady until the caution or warning alert condition disappears.

TERR RNG (red) : For a RANGE error warning.

TERR TST (amber) : Appears during the EGPWS test, when the terrain pattern is displayed, and there is no failure.

(5) Terrain or obstacle caution alert

Generated when a conflict exists between the terrain caution envelope, ahead of the aircraft, and the terrain/obstacles data stored in the database. The conflict area is shown in solid yellow.

(6) Terrain or obstacle warning alert

Generated when a conflict exists between the terrain warning envelope, ahead of the aircraft, and the terrain/obstacles data stored in the database. The conflict area is shown in solid red.

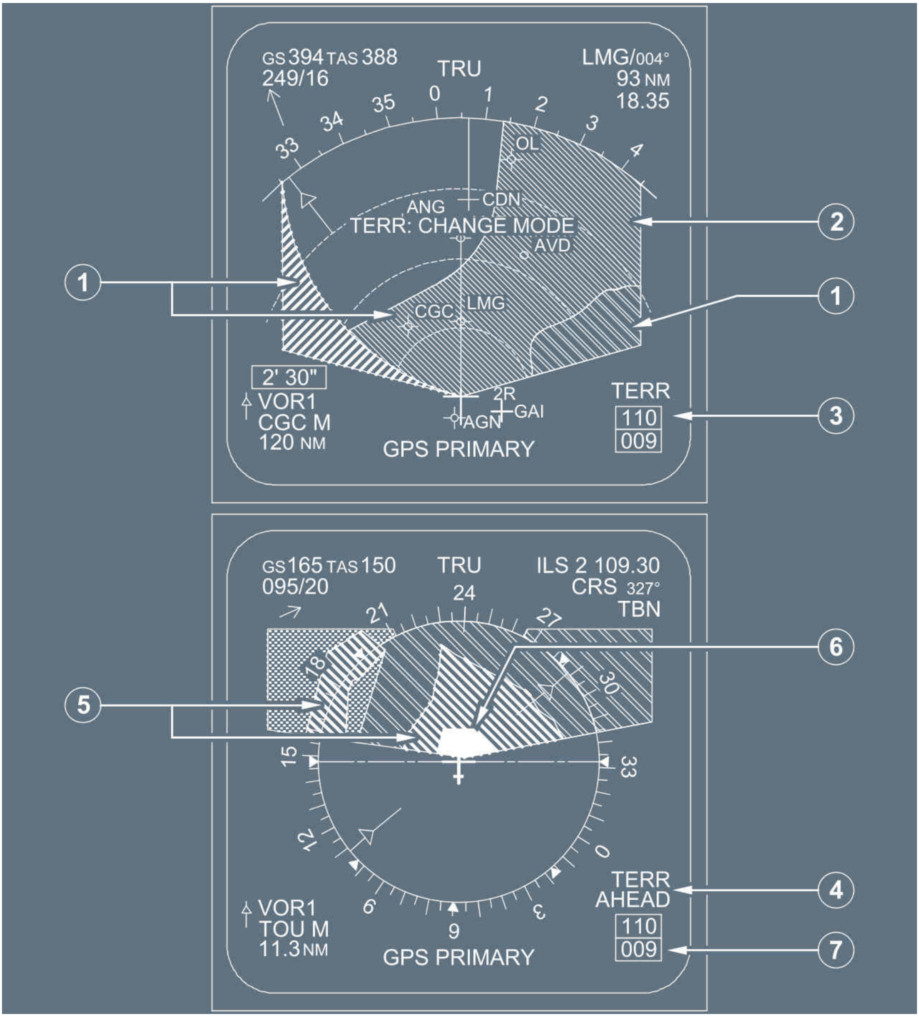
Note: *When an alert is generated (either caution or warning), and TERR ON ND is not selected, the terrain/obstacles is automatically displayed and the TERR ON ND pushbutton ON light comes on.*

(7) Lowest and highest elevations

Minimum and maximum elevations encountered ahead of the aircraft, within the selected ND range. The color code of the elevation figures is the same as for the EGPWS terrain picture.

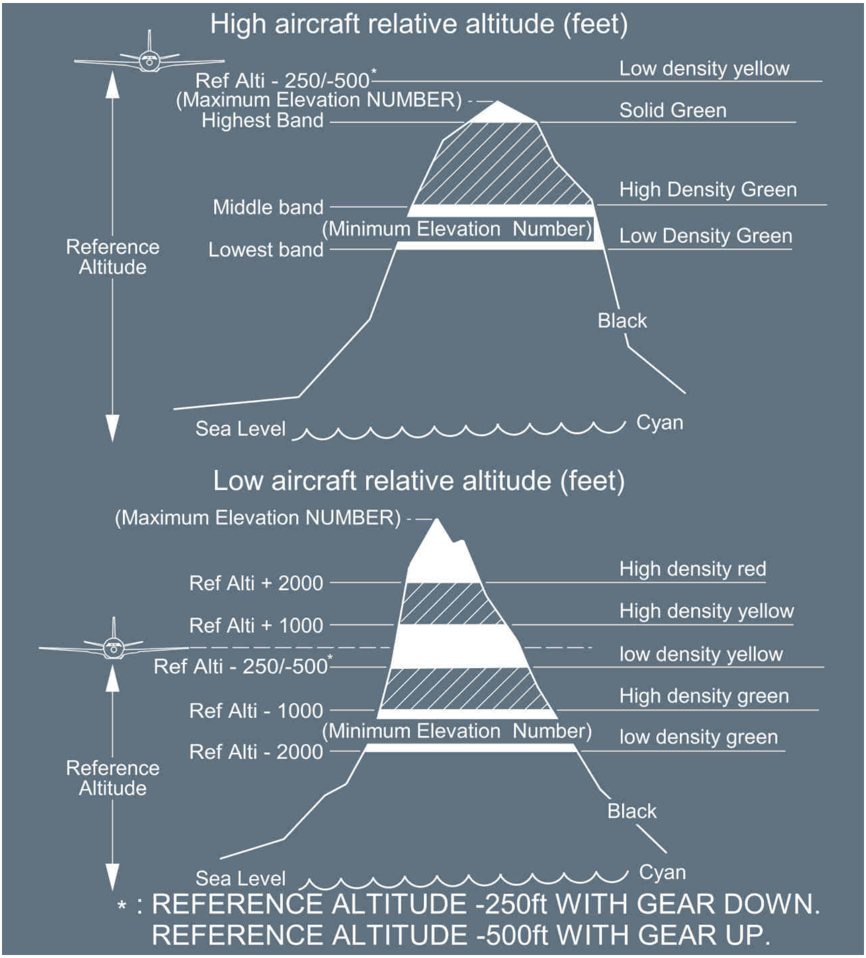
EGPWS

Ident.: DSC-31-45-00009015.0006001 / 09 OCT 14
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU


GS 394 TAS 388
249/16
TRU
LMG/004°
93 NM
18.35
33
34
35
0
1
2
3
4
OL
ANG
CDN
TERR: CHANGE MODE
AVD
CGC
LMG
2' 30"
VOR1
CGC M
120 NM
2R
GAI
AGN
GPS PRIMARY
TERR
110
009
1
2
1
3
GS 165 TAS 150
095/20
TRU
24
ILS 2 109.30
CRS 327°
TBN
21
27
18
30
15
33
12
0
6
9
3
VOR1
TOU M
11.3 NM
GPS PRIMARY
TERR
AHEAD
110
009
5
6
4
7

(1) EGPWS terrain picture

The ND displays the EGPWS terrain picture, when the TERR ON ND switch is selected ON, and the ND is not in PLAN or ENG mode. The terrain picture replaces the weather radar image. Terrain data is displayed independently of the aircraft relative altitude. The terrain appears in different colors and densities, according to its relative height:


High aircraft relative altitude (feet)
Ref Alti - 250/-500*
(Maximum Elevation NUMBER)
Highest Band
Middle band
(Minimum Elevation Number)
Lowest band
Reference Altitude
Low density yellow
Solid Green
High Density Green
Low Density Green
Black
Cyan
Sea Level
Low aircraft relative altitude (feet)
(Maximum Elevation NUMBER)
Ref Alti + 2000
Ref Alti + 1000
Ref Alti - 250/-500*
Ref Alti - 1000
(Minimum Elevation Number)
Ref Alti - 2000
Reference Altitude
High density red
High density yellow
low density yellow
High density green
low density green
Black
Cyan
Sea Level

* : REFERENCE ALTITUDE -250ft WITH GEAR DOWN.
REFERENCE ALTITUDE -500ft WITH GEAR UP.

Note:
- *Areas without available terrain data in the EGPWS database appear in magenta.*
- *The reference altitude is computed based on the current aircraft altitude or, if descending more than 1 000 ft/min, the altitude expected in 30 s.*
- *In case of flight above the maximum elevation number the relief between the minimum and maximum displayed elevations is displayed by using three different green levels.*

(2) Center Part Messages

- The “TERR CHANGE MODE” indication is displayed in red (or amber), in the case of a Terrain Awareness Display (TAD) warning (or caution) alert, if the current selected display mode is PLAN.
- The “TERR REDUCE RANGE” indication is displayed in red (or amber), in the case of a Terrain Awareness Display (TAD) warning (or caution) alert, if the selected range is 160 NM or 320 NM.

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To differentiate between the terrain and the weather display, the weather radar TILT is replaced by a blue TERR, and the terrain display sweeps from the center outward to both ND sides.

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TERR AHEAD/OBST AHEAD (amber) : For a caution

TERR AHEAD/OBST AHEAD (red) : For a warning.

When triggered, these messages flash for 9 s, then remain steady until the caution or warning alert condition disappears.

TERR RNG (red) : For a RANGE error warning.

TERR TST (amber) : Appears during the EGPWS test, when the terrain pattern is displayed, and there is no failure.

(5) Terrain or obstacle caution alert

Generated when a conflict exists between the terrain caution envelope, ahead of the aircraft, and the terrain/obstacles data stored in the database. The conflict area is shown in solid yellow.

(6) Terrain or obstacle warning alert

Generated when a conflict exists between the terrain warning envelope, ahead of the aircraft, and the terrain/obstacles data stored in the database. The conflict area is shown in solid red.

Note: *When an alert is generated (either caution or warning), and TERR ON ND is not selected, the terrain/obstacles is automatically displayed and the TERR ON ND pushbutton ON light comes on.*

(7) Lowest and highest elevations

Minimum and maximum elevations encountered ahead of the aircraft, within the selected ND range. The color code of the elevation figures is the same as for the EGPWS terrain picture.

Note: *The elevations shown on the ND correspond to the terrain included in the selected ND range, ahead of the aircraft. In ARC mode, the elevations are linked with the terrain displayed on the ND. In ROSE mode, the elevations may not represent the lowest and highest terrain currently displayed on the ND.*

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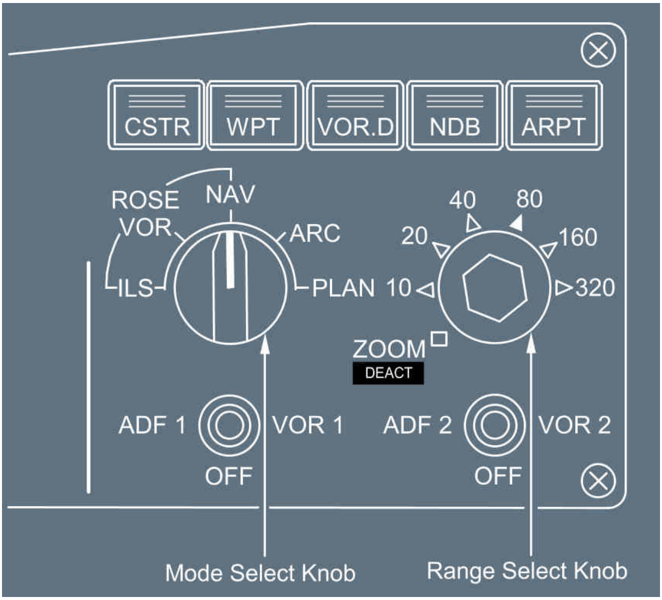
EFIS CONTROL PANEL WITH OANS ⩤ ZOOM FUNCTION

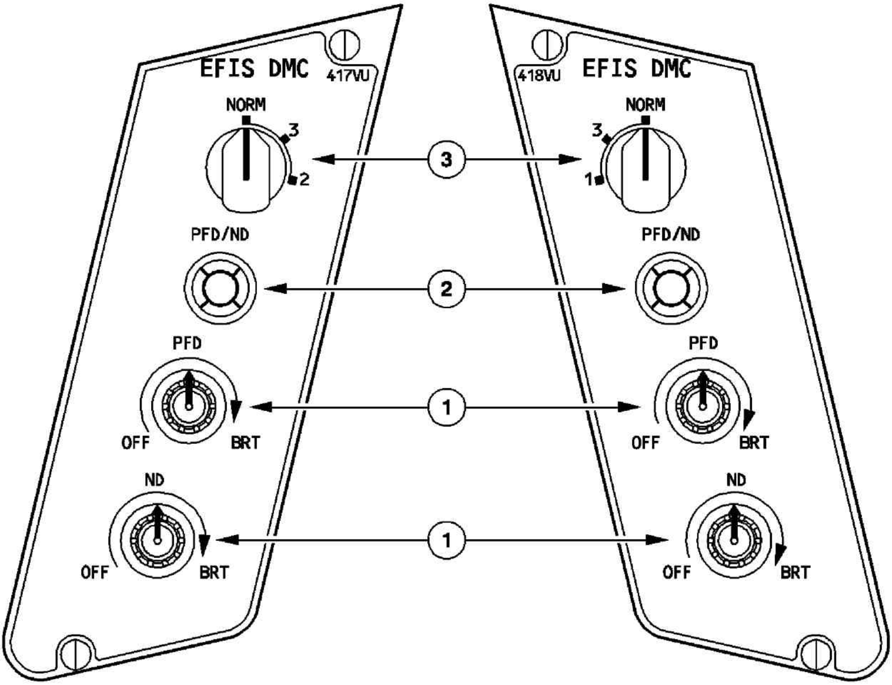
Ident.: DSC-31-50-00018571.0001001 / 21 MAR 16
Applicable to: ALL

The On-board Airport Navigation System (OANS) is an optional function that provides the flight crew with a moving airport map on the ND. The OANS is designed to improve the flight crew awareness of airport surfaces. Refer to DSC-34-35 Airport Navigation.
The OANS requires a dedicated EFIS control panel with a ZOOM notch on the range knob-selector. If OANS is not installed or is deactivated, a DEACT placard is present below the ZOOM notch on the EFIS control panel.
The flight crew can turn the knob-selector to the ZOOM notch, however the map displayed on the ND will remain at 10 NM range and a led will turn on to indicate that the knob-selector is in ZOOM (DEACT) position. Turn back the knob-selector as necessary to select the required range.


CSTR
WPT
VOR.D
NDB
ARPT
ROSE
NAV
VOR
ARC
ILS
PLAN
10
20
40
80
160
320
ZOOM
DEACT
ADF 1
VOR 1
OFF
ADF 2
VOR 2
OFF
Mode Select Knob
Range Select Knob

EFIS DMC PANEL

Ident.: DSC-31-50-00000760.0002001 / 18 MAY 22
Applicable to: ALL


EFIS DMC
417VU
NORM
3
2
PFD/ND
PFD
OFF
BRT
ND
OFF
BRT
3
2
1
1
418VU
EFIS DMC
NORM
3
1
PFD/ND
PFD
OFF
BRT
ND
OFF
BRT

(1) OFF/BRT knobs

- These knobs turn the PFD and ND display units on and off, and control their brightness.
- The display brightness automatically adjusts for changing light conditions. It may also be adjusted manually.

PFD Brightness Control Knob

Rotating this knob all the way counterclockwise switches off the PFD. In this case, the PFD image is automatically displayed on the NDU, but the pilot may recover the ND by means of the PFD-ND XFR pushbutton.

ND Brightness Control Knob

The outer knob controls only the brightness of both the weather radar image and the EGPWS terrain display.

The inner knob controls the general brightness of the ND symbols.

Rotating this knob all the way counterclockwise switches off the NDU.

(2) PFD/ND Pushbutton

Pushing this button interchanges the PFD and the ND.

If the PFDU fails, the PFD transfers automatically to the NDU.

(3) EFIS DMC sel

NORM: The DMC 1 supplies CAPT EFIS DUs and DMC 2 supplies F/O EFIS DUs.

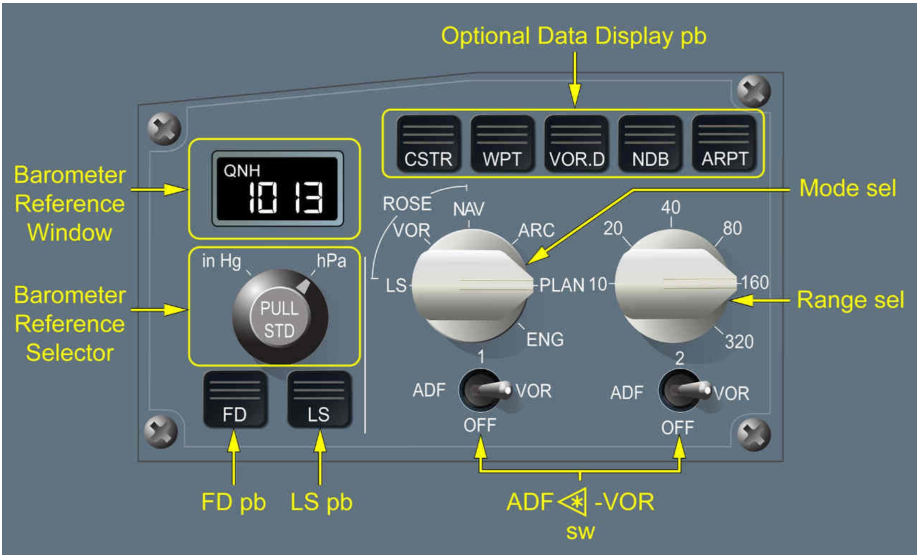
3 : The onside DMC is replaced by DMC3.

2 or 1 : The onside DMC is replaced by DMC 2 or 1.

Some switching configurations generate FMA message (*Refer to DSC-22_30-80-20 EFIS SINGLE SOURCE 1(2)*, *Refer to DSC-22_30-80-20 EFIS SWTG NOT ALLOWED*).

EFIS CONTROL PANEL

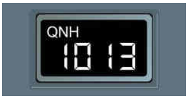
Ident.: DSC-31-50-A-00024284.0001001 / 03 NOV 23
Applicable to: ALL


Optional Data Display pb
CSTR
WPT
VOR.D
NDB
ARPT
Mode sel
Barometer Reference Window
QNH
1013
Barometer Reference Selector
in Hg
hPa
PULL STD
ROSE
NAV
VOR
ARC
LS
PLAN
ENG
10
20
40
80
160
320
Range sel
FD
LS
1
ADF
VOR
OFF
2
ADF
VOR
OFF
FD pb
LS pb
ADF ◁ -VOR
sw

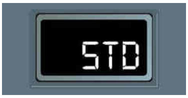
Ident.: DSC-31-50-A-00024285.0002001 / 04 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

BAROMETER REFERENCE WINDOW

L12



The barometric reference is set to QNH and the QNH value is 1 013 hPa. The minimum QNH value that can be selected is 745 hPa (22.00 inHg) and the maximum is 1 100 hPa (32.48 inHg).

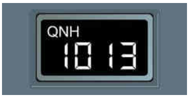


The barometric reference is set to STD.

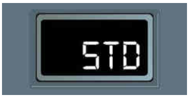
Ident.: DSC-31-50-A-00024285.0001001 / 04 NOV 21
Applicable to: LV-GKO, LV-GKP

BAROMETER REFERENCE WINDOW

L12



The barometric reference is set to QNH and the QNH value is 1 013 hPa. The minimum QNH value that can be selected is 745 hPa (22.00 inHg) and the maximum is 1 050 hPa (31.00 inHg).

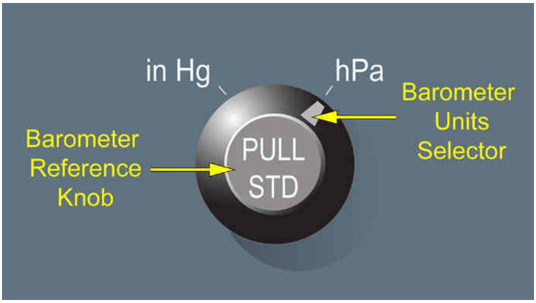


The barometric reference is set to STD.

Ident.: DSC-31-50-A-00024287.0001001 / 02 JUN 20
Applicable to: ALL

BAROMETER REFERENCE SELECTOR SCHEMATIC

The barometric reference controls have an outer selector, and an inner knob.



The flight crew uses the barometric reference selector to select the barometric unit hectoPascals (hPa) or inches of mercury (inHg).

L2 *Note: The PFDs do not display the selected barometric unit.*

Ident.: DSC-31-50-A-00024288.0001001 / 04 NOV 21
Applicable to: ALL

BAROMETER REFERENCE SELECTOR

The flight crew turns the barometric reference knob to select the QNH value.
The flight crew pulls or pushes the barometric reference knob to select the barometric reference (QNH or STD).
When the flight crew pulls the barometric reference knob, the barometric reference value is set to STD.

When the flight crew pushes the barometric reference knob, the barometric reference is set to QNH.

L2 The selected QNH value appears in the barometric reference window, and under the altitude scale on the PFD.

L1 At the EFIS CP power-up, the barometric reference is QNH and the QNH value is set to 1 013 hPa or 29.92 inHg, depending on the selected barometric unit.

Ident.: DSC-31-50-A-00024289.0001001 / 02 JUN 20
Applicable to: ALL

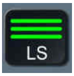
FD PB

The CAPT(F/O) PFD displays the FD bars (or the FPD symbol if the TRK FPA reference is selected).

The CAPT(F/O) PFD does not display the FD bars (or the FPD symbol if the TRK FPA reference is selected).

Ident.: DSC-31-50-A-00024290.0001001 / 15 NOV 21
Applicable to: ALL

LS PB



The CAPT(F/O) PFD displays the following landing system data in accordance with the approach selected on the ARRIVAL page (ILS / GLS ◁ / FLS ◁ / SLS ◁):
Deviation scales, deviation signals, course pointer, information.
For more information about the landing system data (*Refer to DSC-31-40 Trajectory Deviation - ILS Approach*).
If the flight crew selected an approach compatible with the FLS ◁ , the FMA displays the FLS ◁ capability, if the flight phase is descent or approach.
The FLS ◁ capability does not appear, if the NO FLS FOR THIS APPR message appeared on the MCDU.

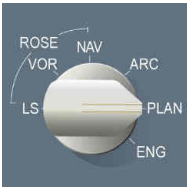
Note: *If the direct distance to the destination airport is more than 300 NM only the deviation scales appear.*

The CAPT(F/O) PFD does not display the landing system data.

Ident.: DSC-31-50-A-00024291.0001001 / 03 JUN 20
Applicable to: ALL

MODE SELECT SWITCH

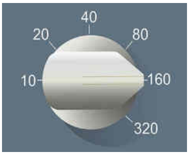
L12



For navigation purposes, the flight crew can select one of the following display modes:
- PLAN mode (*Refer to DSC-31-45 Plan Mode*
  If the flight crew selects the PLAN mode, the ND does not display terrain, weather, or traffic information.
- ARC mode (*Refer to DSC-31-45 ROSE NAV Mode/ARC Mode*)
- ROSE-NAV mode (*Refer to DSC-31-45 ROSE NAV Mode/ARC Mode*)
- ROSE-VOR mode (*Refer to DSC-31-45 Rose VOR Mode*)
- ROSE-LS mode (*Refer to DSC-31-45 Rose LS Mode*)
- ENG mode (*Refer to DSC-31-45 Engine Standby Page*)

Ident.: DSC-31-50-A-00024292.0001001 / 02 JUN 20
Applicable to: ALL

RANGE SELECT SWITCH

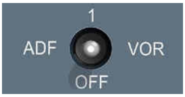


The range selector enables the flight crew to select the range of the ND.

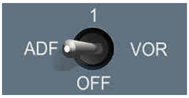
Note: *If the mode or the range data fails, the default selection is the ROSE NAV mode and 80 NM range.*

Ident.: DSC-31-50-A-00024294.0001001 / 02 JUN 20
Applicable to: ALL

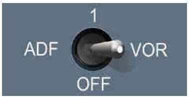
ADF1(2) ◁ - VOR1(2) SELECT SWITCHES



The ND does not display the ADF1(2) ◁ or VOR1(2) bearing pointers and DME distance.



Enables the flight crew to select ADF1(2) ◁ on the onside ND, as well as the corresponding navaid data characteristics in any mode except PLAN mode.

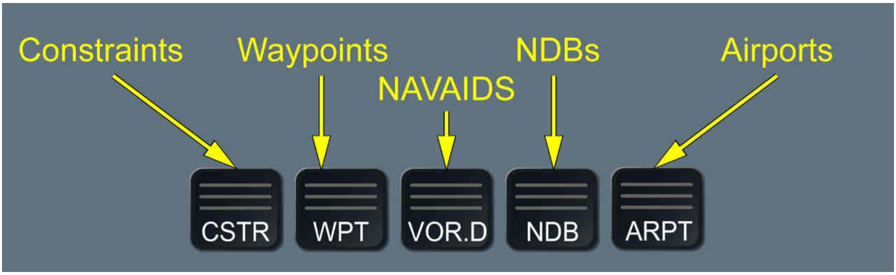


Enables the flight crew to select VOR1(2) bearing pointers and DME distance on the onside ND, as well as the corresponding navaid data characteristics in any mode except PLAN mode.

Ident.: DSC-31-50-A-00024295.0001001 / 02 JUN 20
Applicable to: ALL

OPTIONAL DATA DISPLAY PUSHBUTTON SCHEMATICS

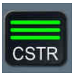
The flight crew can use the following pushbuttons to display the associated optional data in addition to the data permanently displayed in PLAN, ARC, or ROSE NAV modes. Only one option can be activated at a time.



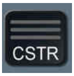
Ident.: DSC-31-50-A-00024296.0001001 / 02 JUN 20
Applicable to: ALL

OPTIONAL DATA DISPLAY PUSHBUTTON

CONSTRAINTS

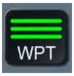


The ND displays constraints related to the waypoints.

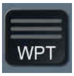


The ND does not display constraints.

WAYPOINTS



The ND displays the waypoints stored in the navigation database and the pilot stored navaids.
The flight crew can only select one display at a time (WPT, VOR-D, or NBD (ADF1(2) ◁✳).



The ND does not display waypoints.

NAVAIDS

The ND displays the VORs and DMEs stored in the navigation database and the pilot stored navaids.
The flight crew can only select one display at a time (WPT, VOR-D, or NBD (ADF1(2) ◁).

The ND does not display VORs and DMEs.

NDBS

The ND displays the NDBs stored in the navigation database.
The flight crew can only select one display at a time (WPT, VOR-D, or NBD (ADF1(2) ◁).

The ND does not display NDBs.

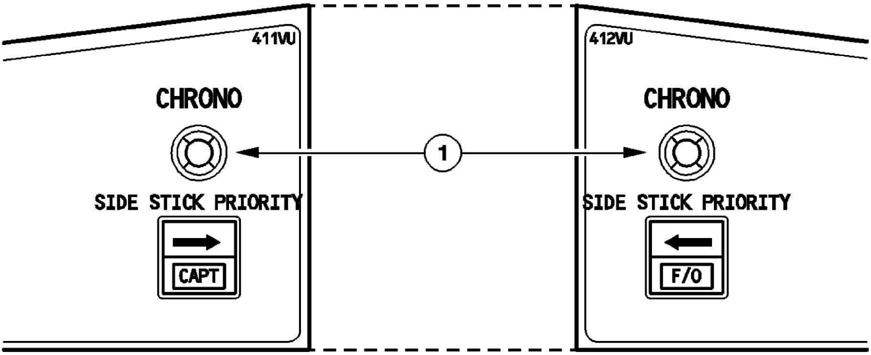
AIRPORTS

The ND displays the airports stored in the navigation database, other than the origin or destination airports.

The ND does not display airports.

CHRONOMETER (GLARESHIELD)

Ident.: DSC-31-50-00000762.0001001 / 27 JAN 11
Applicable to: ALL



(1) CHRONO Pushbutton
Pushing this button displays chronometer time on the onside ND.
Pushing it again freezes the displayed value.
Pushing it a third time resets the chronometer, and the chronometer time disappears from the display.

MEMO DISPLAY

Ident.: DSC-31-50-00017075.0001001 / 21 MAR 16
Applicable to: ALL

EFIS SWTG : This memo appears in green, when either the CAPT EFIS DMC selector or the F/O EFIS DMC selector is not in the NORM position.

GENERAL

Ident.: DSC-31-55-10-00000763.0007001 / 14 FEB 11
Applicable to: ALL

A fully independent clock is on the right side of the control panel.
It sends time to the Central Maintenance Computer, the Flight Data Interface Unit, and the Flight Management and Guidance Computer.
The clock has two electrical supplies, one of which is a direct connection to the aircraft's battery hot bus.

The clock performs four functions:
- It displays “UTC” (GMT) time in hours, minutes, and seconds, on the center counter.
- It displays elapsed time (ET) (from engine startup) in hours, and minutes, on the lower counter.
- It drives the chronometer (CHR), which measures a time interval (from the pushing of the CHRONO button) in minutes and seconds, and displays it with a needle and in numbers on the upper counter.
- It can replace the UTC with the date.

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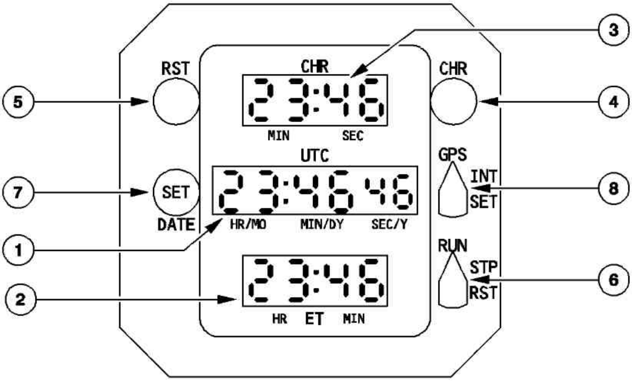
GENERAL

Ident.: DSC-31-55-20-00000764.0004001 / 14 FEB 11
Applicable to: ALL


RST
CHR
CHR
23:46
MIN
SEC
UTC
GPS
SET
DATE
23:46 46
HR/MO
MIN/DY
SEC/Y
INT
SET
RUN
STP
RST
23:46
HR
ET
MIN
1
2
3
4
5
6
7
8

(1) UTC (GMT) counter
This counter displays the present time in 24 h format from 0 to 23 h 59 min 59 s.

(2) Elapsed Time (ET) counter
This counter registers the aircraft's flight time from 0 to 99 h and 59 min.

(3) Chrono (CHR) counter
This counter registers elapsed time from 0 to 99 min 59 s. It is controlled by the CHR pushbutton.

(4) CHR pushbutton

First push : Starts the CHR counter

Second push: Stops the CHR counter, and keeps the display at its last indication.

(5) Reset (RST) pushbutton
When pressed, the CHR counter restarts from 0, if the chrono is running.

(6) ET selector

"RUN"	:	The ET counter starts
"STP"	:	The ET counter stops counting
Spring-loaded "RST"	:	The ET counter goes blank. The selector returns to its STP position when the selector is released.

Note: A cumulative elapsed time can be achieved by alternatively setting this switch to the "RUN" and "STP" position.

(7) DATE/SET button

First push	:	Sets the clock to date mode. The UTC time display is replaced by the date (day/month/year).
Second push	:	Sets the clock to time mode. The date display disappears.

Note: In order to select the date mode, switch the UTC selector to "GPS" or "INT" .

(8) UTC selector

GPS : The time (or date, if selected) is displayed, and this data is synchronized with GPS information.

Note:
- *If the signal between the GPS and the clock is not detected, or if the signal is detected, but the GPS data is invalid, the clock automatically runs on its internal time.*
- *The clock will automatically resynchronize with the GPS information, as soon as the GPS data is available.*

INT : The internal time (or date, if selected) is displayed.

Note:
- *The clock's internal time is always synchronized with the latest valid GPS information unless the pilot enters a different internal time, via the SET function.*
- *If there is no valid GPS information at power up, the internal time will be 00: 00: 00, until the clock is initialized, or until valid GPS information is available.*

SET : Allows the internal time and date to be initialized.

OPERATION IN INTERNAL MODE

Ident.: DSC-31-55-20-00005549.0001001 / 20 SEP 16
Applicable to: ALL

DATE INITIALIZATION

Set the UTC selector to SET. The minute digits flash, and the seconds' digits are blank.
To increase data, turn the DATE/SET pushbutton clockwise.
To decrease data, turn the DATE/SET pushbutton counterclockwise.

- First, press on DATE/SET: To set the hour.
- Second, press on DATE/SET: To set the year.
- Third, press on DATE/SET: To set the month.
- Fourth, press on DATE/SET: To set the day.

Switch the UTC selector to INT, position and the clock will start with the seconds' digits at 00.

Note: *This process must be completed in less than one minute. Otherwise, it will be necessary to reset the CMC, in order to synchronize the lower ECAM time display with the cockpit clock display. Resetting the CMC is a maintenance operation.*

PRECAUTION IN CASE OF ATC DATALINK COMMUNICATION

If the clock is set to internal (INT) mode and the flight crew manually sets the time and date, the clock does not comply with the time precision required for ATC datalink communication (+/- 1 s UTC). This may lead to the rejection of messages, or to the acceptance of obsolete messages:

- The CPDLC function will send CPDLC messages with an erroneous date/time
- The CPDLC function will accept obsolete uplink messages and may reject uplink messages with a correct date/time
- The uplink messages for oceanic and departure clearance will be displayed in the Datalink Control and Display Unit (DCDU) with an erroneous time
- The ADS-C function will continue to operate, but in a degraded mode.

To comply with the time precision requirement for ATC datalink communication, the flight crew must either:

- Use the clock in GPS mode, or
- Use the clock in INT mode and synchronize the clock with the GPS at least one time per day. This synchronization ensures that the UTC time drift is below +/- 1 s UTC.

GPS SYNCHRONIZATION IN INTERNAL MODE

When the clock is set to INT mode, the UTC time is only based on the internal clock and is not synchonized with the GPS. To reset the drift that results from the UTC internal time, the flight crew must perform the following actions:

- Set the UTC selector of the clock to the GPS mode and keep this setting during at least 10 seconds
- Then reset the UTC selector of the clock to INT mode.

These actions result in a resynchronization of the internal clock with the GPS.

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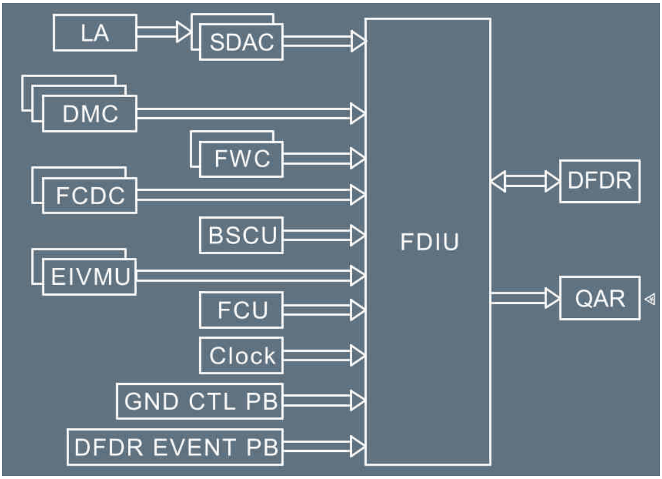
DESCRIPTION

Ident.: DSC-31-60-10-00017892.0003001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP

The Flight Data Recording System, which records the mandatory parameters, consists of the following components:
- A Flight Data Interface Unit (FDIU)
- A Digital Flight Data Recorder (DFDR)
- A three-axis Linear Accelerometer (LA)

The FDIU collects and processes parameters from the SDACs, DMCs, FWCs, FCDCs, BSCU, EIVMUs, FCU, the DFDR event pushbutton, the GND CTL pushbutton and the Clock.
It stores the mandatory flight parameters in the DFDR.
The DFDR can store the last 25 h data, at least. It stores this data on a fireproof and shockproof device. An underwater locator beacon is attached to the DFDR.
The linear accelerometer measures the acceleration of the aircraft along each of the three axes.
The QAR ◁ is a recorder that stores the same data as the DFDR. However, the QAR ◁ is more accessible for the maintenance crew.



The recording system is automatically active:
- On ground, during the first 5 min after the aircraft electric network is energized.
- On ground, after the first engine start.
- In flight (whether the engines are running or not).

On the ground, the recording system automatically stops 5 min after the second engine shuts down.

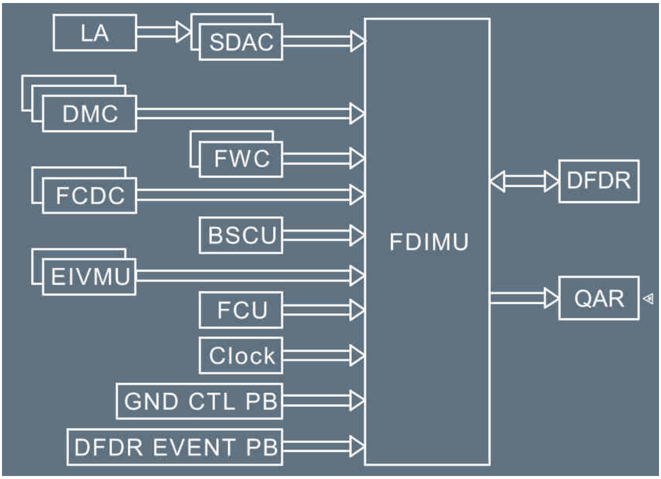
On the ground, the crew can manually start the recording system by pressing the GND CTL pushbutton.

DESCRIPTION

Ident.: DSC-31-60-10-00017892.0005001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Flight Data Recording System, which records the mandatory parameters, consists of the following components:
- A Flight Data Interface and Management Unit (FDIMU)
- A Digital Flight Data Recorder (DFDR)
- A three-axis Linear Accelerometer (LA)

The FDIMU collects and processes parameters from the SDACs, DMCs, FWCs, FCDCs, BSCU, EIVMUs, FCU, the DFDR event pushbutton, the GND CTL pushbutton and the Clock.
It stores the mandatory flight parameters in the DFDR.
The DFDR can store the last 25 h data, at least. It stores this data on a fireproof and shockproof device. An underwater locator beacon is attached to the DFDR.
The linear accelerometer measures the acceleration of the aircraft along each of the three axes.
The QAR ◁ is a recorder that stores the same data as the DFDR. However, the QAR ◁ is more accessible for the maintenance crew.



The recording system is automatically active:

- On ground, during the first 5 min after the aircraft electric network is energized.
- On ground, after the first engine start.
- In flight (whether the engines are running or not).

On the ground, the recording system automatically stops 5 min after the second engine shuts down.
On the ground, the crew can manually start the recording system by pressing the GND CTL pushbutton.

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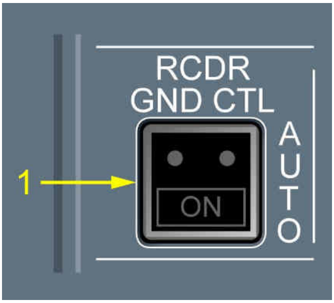
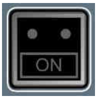
OVERHEAD PANEL

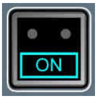
Ident.: DSC-31-60-20-00000841.0001001 / 30 AUG 18
Applicable to: ALL



(1) RCDR GND CTL pb-sw



The CVR, DFDR, and QAR ◁ automatically operate (AUTO), according to the logic (*Refer to DSC-31-60-10 Description*).

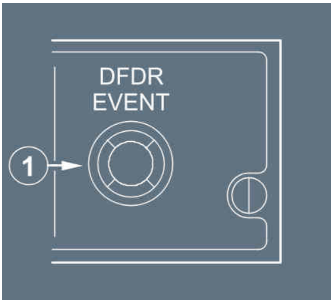


The flight crew manually starts the CVR, DFDR, and QAR ◁ .
After engine start, the ON light goes off and the recorders automatically operate.

Note: *The RCDR GND CTL pb-sw may revert to AUTO (active or inactive, according to the logic) during an electrical transient.*

PEDESTAL

Ident.: DSC-31-60-20-00000843.0001001 / 09 OCT 12
Applicable to: ALL



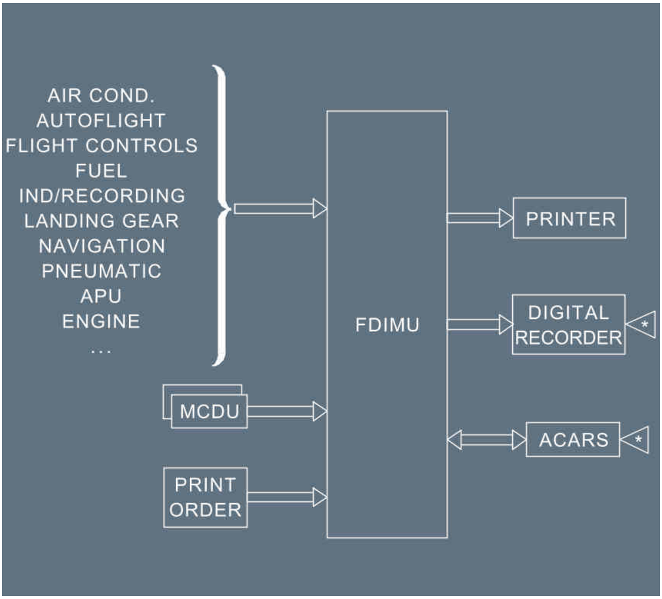
(1) DFDR EVENT pushbutton

- Pressing this button (briefly) sets an event mark on the Flight Data records.

DESCRIPTION

Ident.: DSC-31-60-30-00000846.0002001 / 16 MAR 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

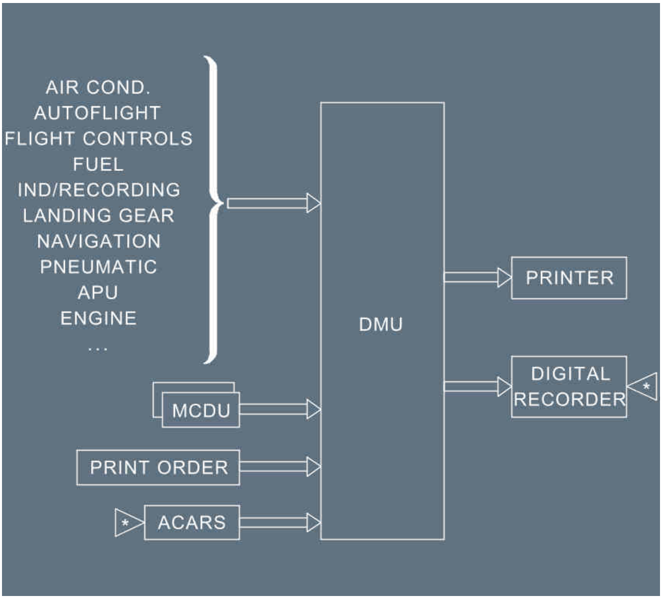
The ACMS is used to monitor various aircraft system parameters in order to make maintenance easier and to allow formulating operational recommendations.
The ACMS can generate system reports. The Airbus Standard Reports are preprogrammed reports available at aircraft delivery. The operator can create its own reports.
The ACMS uses the Flight Data Interface and Management Unit (FDIMU) to acquire the relevant aircraft system parameters. The FDIMU is connected to the rest of the ACMS as shown below.
The system may be programmed using the MCDUs. The crew can select any report to be displayed on the MCDUs.
The Printer prints the flight phase programmed reports or any report selected on the MCDU.
This printing may be automatic or in response to the ACMS PRINT pushbutton.
The ACMS may send automatic reports via ACARS ◁* .
An optional Digital Recorder may be installed to extend the recording capacity.


AIR COND.
AUTOFLIGHT
FLIGHT CONTROLS
FUEL
IND/RECORDING
LANDING GEAR
NAVIGATION
PNEUMATIC
APU
ENGINE
...
MCDU
PRINT ORDER
FDIMU
PRINTER
DIGITAL RECORDER
*
ACARS
*

DESCRIPTION

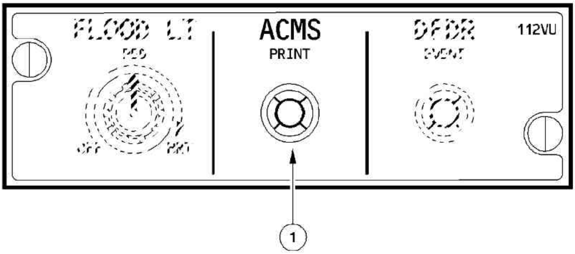
Ident.: DSC-31-60-30-00000846.0004001 / 16 MAR 11
Applicable to: LV-GKO, LV-GKP

The ACMS is used to monitor various aircraft system parameters in order to make maintenance easier and to allow formulating operational recommendations.
The ACMS can generate system reports. The Airbus Standard Reports are preprogrammed reports available at aircraft delivery. The operator can create its own reports.
The ACMS consists of a Data Management Unit (DMU) connected as shown below.
The system may be programmed using the MCDUs. The crew can select any report to be displayed on the MCDUs.
The Printer prints the flight phase programmed reports or any report selected on the MCDU.
This printing may be automatic or in response to the ACMS PRINT pushbutton.
The ACMS may send automatic reports via ACARS ◁* .
An optional Digital Recorder may be installed to extend the recording capacity.


AIR COND.
AUTOFLIGHT
FLIGHT CONTROLS
FUEL
IND/RECORDING
LANDING GEAR
NAVIGATION
PNEUMATIC
APU
ENGINE
...
MCDU
PRINT ORDER
*
ACARS
DMU
PRINTER
DIGITAL
RECORDER
*

CONTROLS ON PEDESTAL

Ident.: DSC-31-60-30-00000850.0001001 / 21 MAR 16
Applicable to: ALL



(1) ACMS PRINT pushbutton
This pushbutton is used to immediately print a specific report, depending on the flight phase. The crew may then use the MCDU to select and instantly print another report.

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AIRCRAFT SYSTEMS

LANDING GEAR

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DSC-32-10 Gears and Doors

DSC-32-10-10 Description

General....A
Main Landing Gear (MLG)....B
Nose Landing Gear (NLG)....C
Landing Gear Extension and Retraction Equipment....D
Landing Gears and Doors Operation....E
Landing Gear Indication and Warning Architecture....F

DSC-32-10-20 Landing Gear System Interface

Landing Gear Control Interface Unit (LGCIU)....A
Landing Gear - Aircraft System Interface....B

DSC-32-10-30 Controls and Indicators

Landing Gear Indicator Panel....A
Landing Gear Selector Lever....B
Landing Gear Gravity Extension....C
Wheel SD Page....D
Memo Display....E

DSC-32-20 Nose Wheel Steering

DSC-32-20-10 Description

Description....A

DSC-32-20-20 Controls and Indicators

Rudder Pedals....A
Side Consoles....B
Center Instrument Panel....C
Wheel SD Page....D
Maintenance panel....E
Memo Display....F

DSC-32-30 Brakes and Antiskid

DSC-32-30-10 Description

General....A
Antiskid System....B
Autobrake....C
Operation....D

Continued on the following page

Continued from the previous page

DSC-32-30-20 Controls and Indicators

Center Instrument Panel....A
Pedestal....B
Wheel SD Page....C
Memo Display....D

DSC-32-40 Tire Pressure Indicating System

DSC-32-40-10 Description

General....A

DSC-32-40-20 Controls and Indicators

Wheel SD Page....A

AIRCRAFT SYSTEMS

LANDING GEAR

PRELIMINARY PAGES - SUMMARY OF HIGHLIGHTS

Localization Title	Toc Index	ID	Reason
DSC-32-20-10 Description	A	1	Effectivity update: The information no longer applies to LV-KAO.
DSC-32-20-10 Description	A	2	Effectivity update: The information now also applies to LV-KAO.
DSC-32-20-20 Side Consoles	B	1	Effectivity update: The information now also applies to LV-KAO.
DSC-32-20-20 Side Consoles	B	2	Effectivity update: The information no longer applies to LV-KAO.

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GENERAL

Ident.: DSC-32-10-10-00018883.0001001 / 21 MAR 16
Applicable to: ALL

The landing gear consists of :
- Two inboard retracting main gears
- One forward retracting nose gear
- One forward retracting center gear (for A340 only).

Gear doors enclose the landing gear bays. Gears and doors are electrically-controlled and hydraulically-operated.
The doors which are fitted to the landing struts are mechanically-operated by the gear, and close at the end of gear retraction.
All gear doors open during landing gear transit. The hydraulically operated doors close at the end of each retraction and extension sequence.
Gears and doors' actuation are electrically-signalled by two Landing Gear Control and Interface Units (LGCIUs).
The LGCIUs process gears and doors positions, sequencing control and gear lever selection. They also provide landing gear information on the ECAM, and ground/flight signals for other aircraft systems.

MAIN LANDING GEAR (MLG)

Ident.: DSC-32-10-10-00018884.0004001 / 21 MAR 16
Applicable to: ALL

Each main gear is a four wheel, twin tandem bogie assembly having an oleopneumatic shock absorber.
Each main wheel is fitted with an antiskid brake.
A shortening mechanism, attached to the wing, reduces main gear length by retracting the shock absorber into the main leg during retraction.
An hydraulically-operated pitch trimmer on each bogie beam damps the movement and ensures return to normal position after liftoff.

NOSE LANDING GEAR (NLG)

Ident.: DSC-32-10-10-00018886.0001001 / 21 MAR 16
Applicable to: ALL

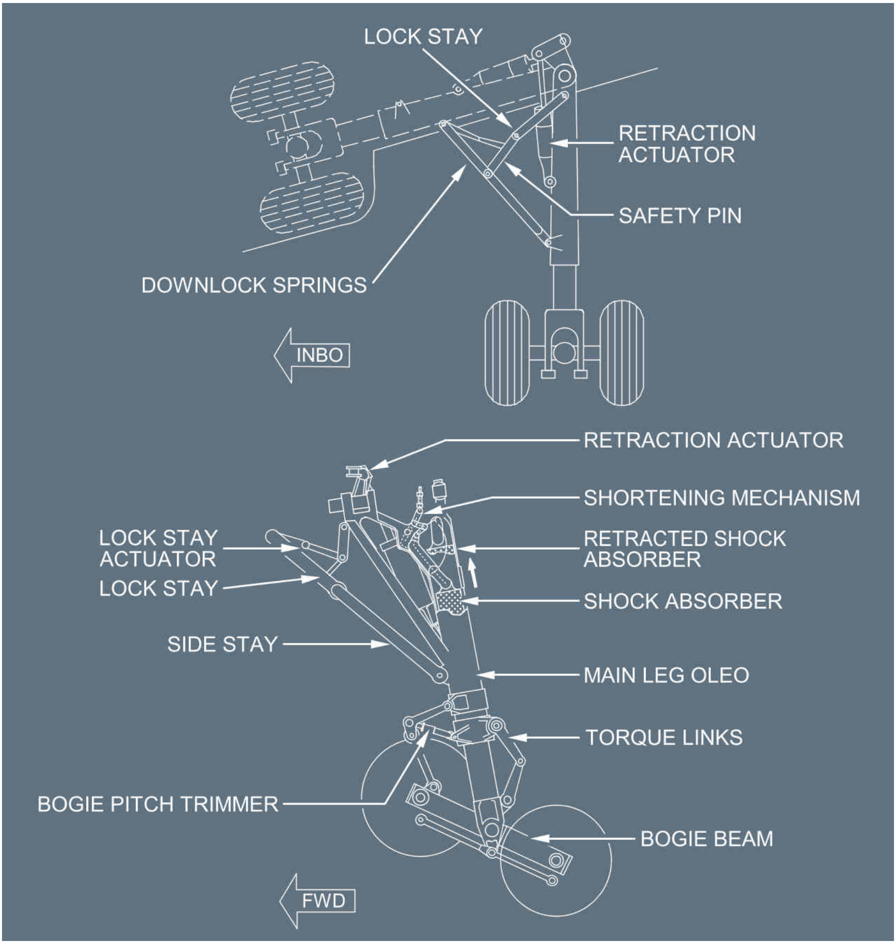
The two-wheel nose gear comprises an oleopneumatic shock strut and a nosewheel steering system.
It retracts forward into the fuselage.

LANDING GEAR EXTENSION AND RETRACTION EQUIPMENT

Applicable to: ALL

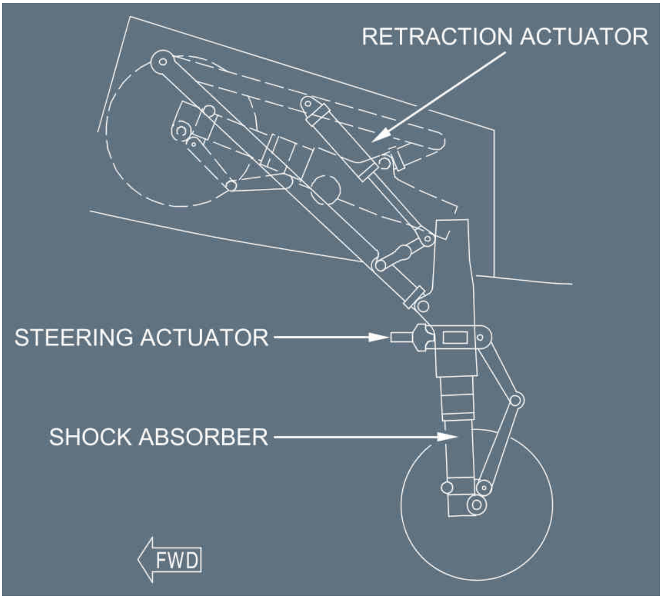
Ident.: DSC-32-10-10-A-00018891.0001001 / 21 MAR 16

MAIN LANDING GEAR


LOCK STAY
RETRACTION ACTUATOR
SAFETY PIN
DOWNLOCK SPRINGS
INBO
RETRACTION ACTUATOR
SHORTENING MECHANISM
LOCK STAY ACTUATOR
RETRACTED SHOCK ABSORBER
LOCK STAY
SHOCK ABSORBER
SIDE STAY
MAIN LEG OLEO
TORQUE LINKS
BOGIE PITCH TRIMMER
BOGIE BEAM
FWD

Ident.: DSC-32-10-10-A-00018892.0001001 / 21 MAR 16

NOSE LANDING GEAR

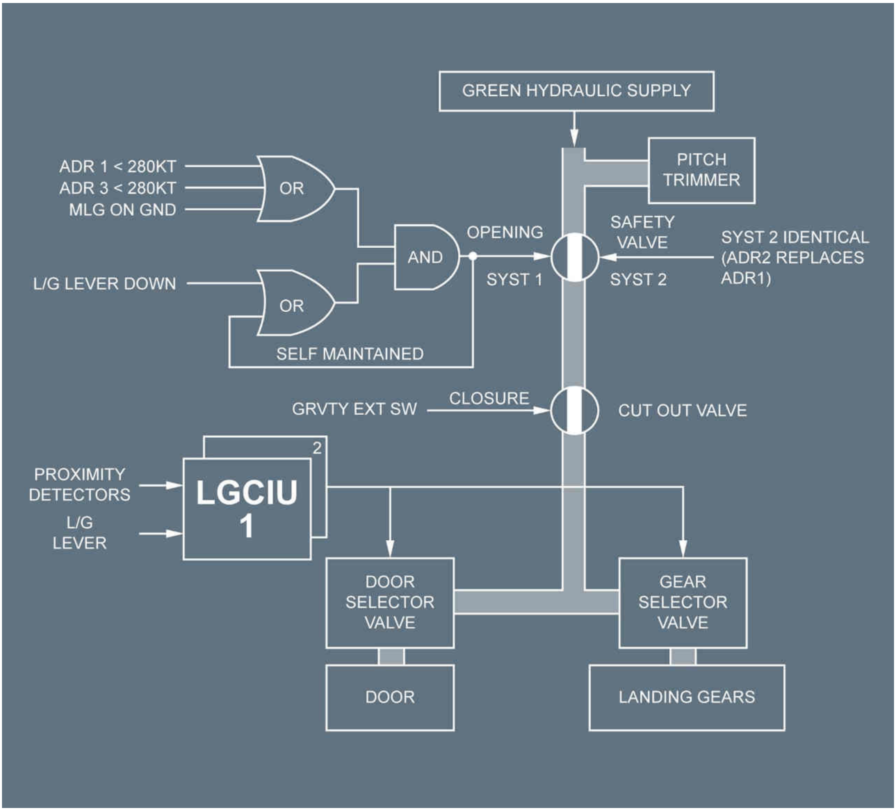


LANDING GEARS AND DOORS OPERATION

Ident.: DSC-32-10-10-00018889.0001001 / 21 MAR 16
Applicable to: ALL

NORMAL OPERATION

Landing gear normal operation is controlled by the lever located on the center instrument panel.
Gear and door sequencing is electrically-controlled by the LGCIUs. Each LGCIU controls one complete gear cycle and switches over automatically at each landing gear retraction cycle or in case of failure.
All gears and doors are hydraulically-actuated by the green hydraulic system. Hydraulic supply is automatically isolated by closing a safety valve above 280 kt. It is maintained closed until the landing gear lever is moved to the DOWN position and the aircraft speed decreases below 280 kt.
For A340-200/300 aircraft, the center landing gear may be inhibited by ground maintenance action. Therefore, it will be mechanically-fixed in the uplock position while doors will continue to operate during the landing gear retract/extend sequence.

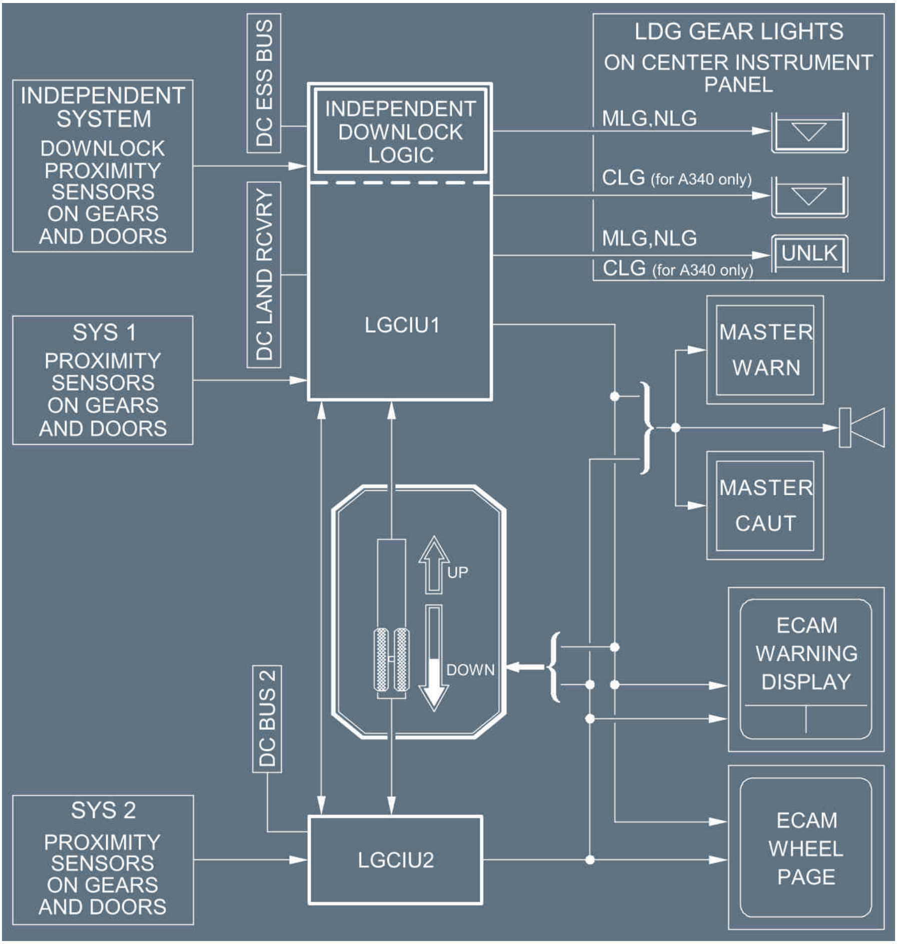

GREEN HYDRAULIC SUPPLY
PITCH TRIMMER
ADR 1 < 280KT
ADR 3 < 280KT
MLG ON GND
OR
AND
OPENING
SYST 1
SAFETY VALVE
SYST 2
SYST 2 IDENTICAL (ADR2 REPLACES ADR1)
L/G LEVER DOWN
OR
SELF MAINTAINED
GRVTY EXT SW
CLOSURE
CUT OUT VALVE
2
PROXIMITY DETECTORS
L/G LEVER
LGCIU 1
DOOR SELECTOR VALVE
GEAR SELECTOR VALVE
DOOR
LANDING GEARS

LANDING GEAR INDICATION AND WARNING ARCHITECTURE

Applicable to: ALL

Ident.: DSC-32-10-10-B-00018887.0002001 / 21 MAR 16

ARCHITECTURE


INDEPENDENT SYSTEM
DOWNLOCK PROXIMITY SENSORS ON GEARS AND DOORS
DC ESS BUS
INDEPENDENT DOWNLOCK LOGIC
DC LAND RCVRY
LGCIU1
LDG GEAR LIGHTS
ON CENTER INSTRUMENT PANEL
MLG,NLG
CLG (for A340 only)
MLG,NLG
UNLK
CLG (for A340 only)
SYS 1
PROXIMITY SENSORS ON GEARS AND DOORS
MASTER WARN
MASTER CAUT
UP
DOWN
ECAM WARNING DISPLAY
DC BUS 2
SYS 2
PROXIMITY SENSORS ON GEARS AND DOORS
LGCIU2
ECAM WHEEL PAGE

Note: *The landing gear position indications on center instrument panel are still provided by LGCIU 1 even when LGCIU 2 is controlling gear cycle.*

Ident.: DSC-32-10-10-B-00018890.0001001 / 21 MAR 16

LANDING GEAR GRAVITY EXTENSION

The gravity extension system is an electro-mechanical system, controlled through two selectors located on the center instrument panel. It permits main and nose landing gear extension in case the normal system fails.

When the related electrical selectors are set to down, the :
- Landing gear hydraulic system is isolated from the green hydraulic system
- Main and nose landing gear doors, and gears unlock
- Main and nose landing gears extend by gravity
- Locking springs assist the downlocking
- Main and nose landing gear doors remain open.

After a free fall extension, it is possible to restore normal operation, provided green hydraulic pressure is available.
The cockpit indications are the same as those for normal extension and retraction.

Note: *In case of landing gear gravity extension, the nose wheel steering is lost.*

LANDING GEAR CONTROL INTERFACE UNIT (LGCIU)

Ident.: DSC-32-10-20-00018894.0001001 / 21 MAR 16
Applicable to: ALL

Two LGCIUs receive landing gear position information from the proximity sensors when:

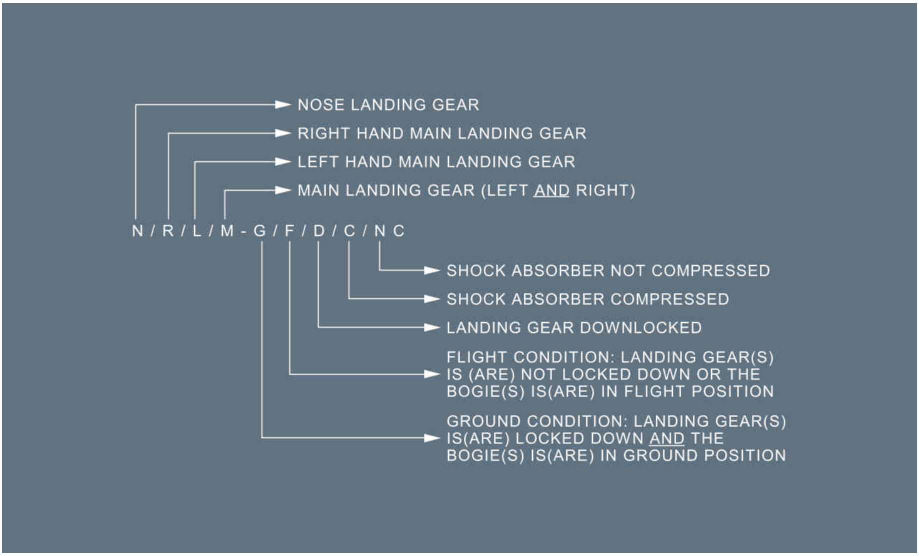
- The landing gears are locked down or up, or
- The shock absorbers are compressed or extended, or
- The landing gear doors are open, or closed.

The LGCIUs send the landing gear position data to other aircraft systems.
In case of a LGCIU failure, the landing gear is controlled by the remaining healthy LGCIU.

LANDING GEAR - AIRCRAFT SYSTEM INTERFACE

Ident.: DSC-32-10-20-00018895.0001001 / 02 JUN 20
Applicable to: ALL

The two LGCIUs provide following discrete logic signals to various aircraft systems.


NOSE LANDING GEAR
RIGHT HAND MAIN LANDING GEAR
LEFT HAND MAIN LANDING GEAR
MAIN LANDING GEAR (LEFT AND RIGHT)
N / R / L / M - G / F / D / C / N C
SHOCK ABSORBER NOT COMPRESSED
SHOCK ABSORBER COMPRESSED
LANDING GEAR DOWNLOCKED
FLIGHT CONDITION: LANDING GEAR(S) IS (ARE) NOT LOCKED DOWN OR THE BOGIE(S) IS(ARE) IN FLIGHT POSITION
GROUND CONDITION: LANDING GEAR(S) IS(ARE) LOCKED DOWN AND THE BOGIE(S) IS(ARE) IN GROUND POSITION

A semicolon (;) separates different signals send to the same system.
Two additional discretes are provided by the LGCIUs.

OP : Applicable LGCIU is signalled operative as long as system is supplied by power.

E : External power connected.

	SYSTEM	LGCIU 1 OUTPUT	LGCIU 2 OUTPUT
AIR COND	Packs bay ventilation	L-F	R-G
	Avionics equipment ventilation	R-G	L-G ; OP
	Fwd and aft cargo compartment vent.		R-F
	Pressure control and monitoring	R-G	R-G
	Pack control and indicating		L/R-G
	Cockpit and cabin temperature control		R-G
FM	FMGS	N-C	N-C
COMMUNICATIONS	HF System	L-F	R-F
	VHF System	L-F	L/R-F
	Satellite communication		R-F
	Cockpit to ground crew call system	N-NC	
	Audio management	L-F	
	CVR	N-C/NC	
	CIDS	N-C/D ; E	N-C/D ; E
	Radio management	L-F	L/R-F
ELEC	AC main generation	N-C	
	AC emergency generation	N-NC	
	ECMS	N-C	
	DC essential normal generation switching	N-NC	
	Battery DC generation	N-C	
	GPCU	N-C	
	Circuit breaker monitoring	N-C	
APU	Control and monitoring	L-G	
	APU generator (GCU)	N-C	
FIRE	Engine fire and overheat protection	L/R-G	L/R-G
	APU fire and cargo compartment overheat detector	M-G	M-G
	Cargo compartment smoke detector	N-C ; E	N-C ; E
	APU fire extinguishing	M-G	
FLT CTL	Flaps control and monitoring	M-G	M-G
	Slats control and monitoring	M-G	M-G
	EFCS	L/R-D ; N-C	L/R-D ; N-C
FUEL	APU fuel pump system	M-G	
	FCMS	L-D ; N-C	L-D ; N-C
HYD	Green main hydraulic power	M-G	M-G
ICE	Wing ice-protection	M-F	M-F
	Probe ice-protection	L/R-G ; E N-C ; OP	L/R-G ; E N-C ; OP
	Windscreen anti-icing and defogging	L/R-G	L/R-G

Continued on the following page

Continued from the previous page

	SYSTEM	**LGCIU 1 OUTPUT**	**LGCIU 2 OUTPUT**
EIS	FWC - acquisition interface	R-G	L-G
	SDAC - acquisition interface	R-G	L-G
	DMC - acquisition interface	R-G	L-G
GEAR	Normal extension and retraction	R-G ; E	R-G ; E
	Normal braking	L/R-G ; N-C/D	R-G ; N-D
	Brake cooling		L-D
LIGHTS	Runway turn off lights	N-D	N-D
	Taxi and take off lights	N-D	N-D
	Logo lights		M-G
	Toilet system		N-C
NAVIGATION	Sensors	N-C	
	Altitude and airspeed standby data	L-G	
	ILS	L-F	R-F
	Weather radar system	L-F	R-F
	Radio altimeter	L-F	L-F
	TCAS	L-G/D	
	GPWS	L-D	
	DME	L-F	R-F
	ATC/MODE S	L-G	R-G
	ADF ◁✳	L-F	R-F
	VOR/MARKER	L-F	R-F
MAIN	CMS acquisition interface	N-C ; E	
	Up and down data loading system	R-G	
DOOR	Doors and escape slide control system	N-C ; E	N-C ; E
ENG	FADEC	L/R-G ; DP N-C	L/R-G ; DP N-C

The following systems get landing gear position selection data from the landing gear lever

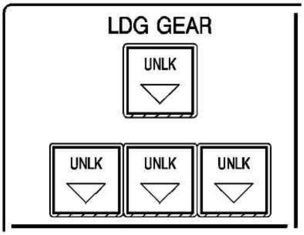
SYSTEM	**L/G lever position**
Refuel on battery	DOWN
FCMS	DOWN
Normal braking	UP
Cabin emergency lighting	UP

Intentionally left blank

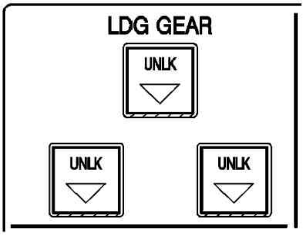
LANDING GEAR INDICATOR PANEL

Ident.: DSC-32-10-30-00018897.0002001 / 21 MAR 16
Applicable to: ALL

A340 Landing Gear Indicator Panel



A330 Landing Gear Indicator Panel



Connected to LGCIU 1 which receives signals from proximity sensors.

No light : Indicate landing gear is retracted and locked up with landing gear lever selected up.

▿ light : Illuminate green if the landing gear is locked down.

UNLK light : Illuminate red if the landing gear is not locked in selected position.

Note: *The green▿ lights on the LANDING GEAR indicator panel come on as long as the LGCIU 1 is electrically supplied. For A340 aircraft, the center landing gear may not light up, depending on the LGCIU failure.*

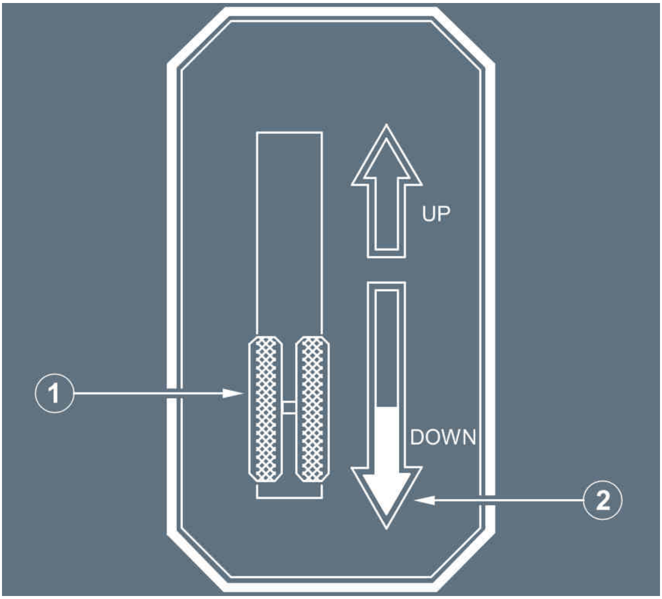
Note: *If one UNLK indication remains on at gear extension, the landing gear position can be confirmed using the WHEEL SD page (information from LGCIU 1 & 2) : only one green triangle on each landing gear is sufficient to confirm that the landing gear is downlocked.*

LANDING GEAR SELECTOR LEVER

Ident.: DSC-32-10-30-00018898.0001001 / 20 MAY 16
Applicable to: ALL

A two-position selector lever provides electrical signals to the two LGCIUs, which control green hydraulic supply by means of selector valves.
The flight crew must always move the L/G lever in one continuous movement (i.e. with no stop between both positions).

Upon selection of UP or DOWN, and provided the airspeed is below 280 kt :
- All landing gear doors open
- Landing gears move to the new selected position
- All doors close.



(1) L/G LEVER

UP : Landing gear retraction is selected.
During gear door opening, main and center (for A340-500/600 only) landing gear wheels are automatically braked by the normal braking system.
The nose gear wheels are braked by a brake band in the gear bay.

DOWN : Landing gear extension is selected.

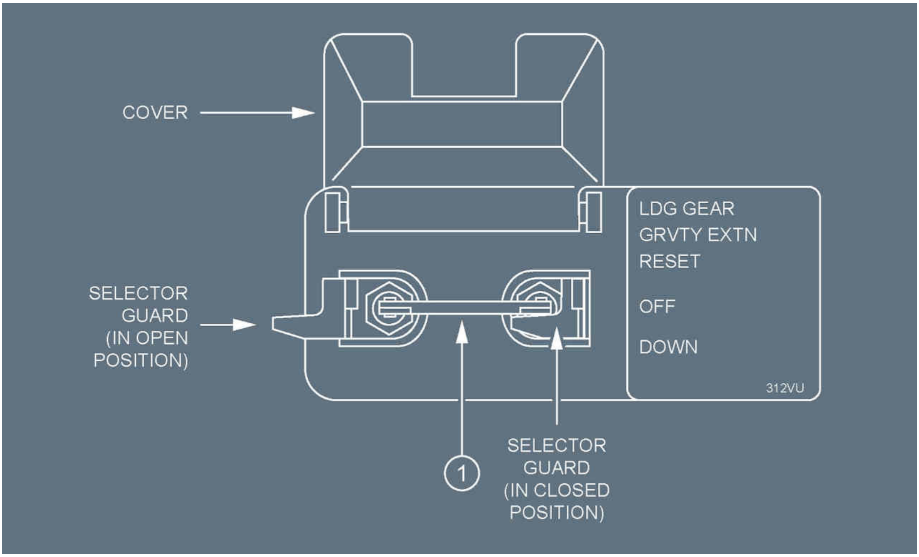
An interlock mechanism prevents unsafe retraction by locking the lever in the DOWN position, when either :
- Both main landing gear bogies are compressed (aircraft on ground), or
- On A340 aircraft, the center landing gear shock absorber is not fully extended (aircraft on ground), or
- The nose landing gear shock absorber is not fully extended (aircraft on ground), and the nose wheels are not in the center position.

When the landing gear is extended, the system remains pressurized (if green hydraulic pressure is available).

(2) RED ARROW
The red arrow, and associated ECAM warnings come on red in approach at 750 ft RA, if the landing gear is not downlocked in landing configuration.*Refer to PRO-ABN-LG L/G GEAR NOT DOWN*

LANDING GEAR GRAVITY EXTENSION

Ident.: DSC-32-10-30-00018899.0001001 / 21 MAR 16
Applicable to: ALL


COVER
SELECTOR
GUARD
(IN OPEN
POSITION)
LDG GEAR
GRVTY EXTN
RESET
OFF
DOWN
312VU
①
SELECTOR
GUARD
(IN CLOSED
POSITION)

The landing gear gravity extension selectors are locked-toggle type selectors. The selectors are connected by a link, so that both are operated simultaneously.

When the link is disconnected, each selector can be independently operated.

(1) LDG GEAR GRVTY EXTN selector
Each selector has three positions :

OFF :	Normal position. Landing gear operation is controlled by the LGCIU and the landing gear lever.
DOWN : (guarded)	The two motorized actuators are electrically-powered to close the hydraulic cut-off valve and to disengage door and gear uplocks which permit the nose, center (for A340-500/600 only), and main landing gear to deploy by gravity and to automatically lock down.
RESET :	The actuators return to the initial position, and automatically set the system back to the normal extension and retraction mode. The selectors are then set to off for normal operation.

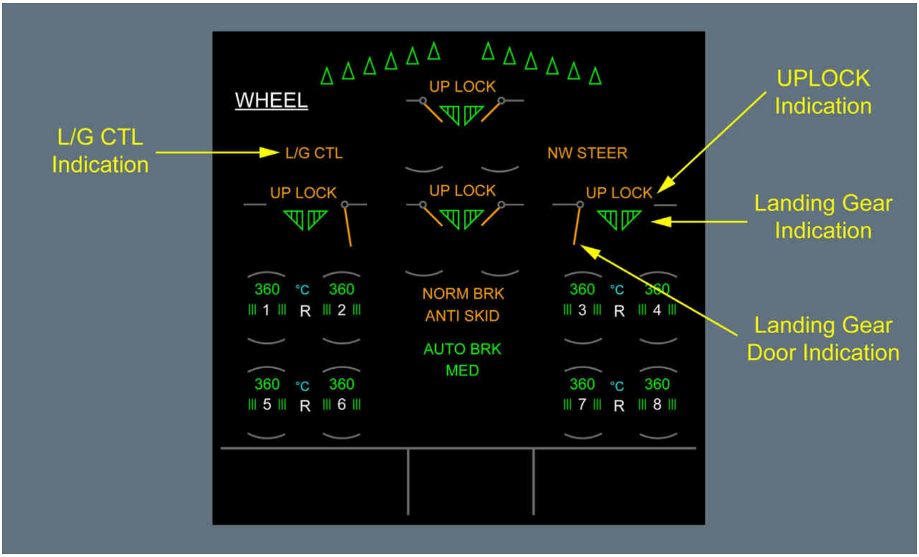
Note: To select the landing gear, both selector guards have to be open.

WHEEL SD PAGE

Ident.: DSC-32-10-30-00018900.0001001 / 08 NOV 22
Applicable to: ALL

The WHEEL SD page is automatically displayed:
- On ground, before takeoff with engine running (flight phase 2). It disappears at engine T.O power application.
- In approach, at landing gear down selection or below 800 ft radio height (flight phases 7, 8, 9). It disappears at engine shutdown.

Wheel SD Page


WHEEL
UP LOCK
L/G CTL
NW STEER
UP LOCK
UP LOCK
UP LOCK
360 °C 360
1 R 2
360 °C 360
5 R 6
NORM BRK
ANTI SKID
AUTO BRK
MED
360 °C 360
3 R 4
360 °C 360
7 R 8
L/G CTL Indication
UPLOCK Indication
Landing Gear Indication
Landing Gear Door Indication

L/G CTL INDICATION

L/G CTL

The associated landing gear position disagrees with the lever position following a 30 s time delay.
The associated ECAM alert is triggered.

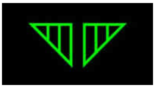
UPLOCK INDICATION

UP LOCK

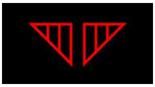
The associated landing gear is locked down, and one or more uplocks are in the closed position.
Associated with the following L/G GEAR UPLOCK FAULT alert (*Refer to PRO-ABN-LG L/G GEAR UPLOCK FAULT*).

LANDING GEAR INDICATION

The landing gear is indicated by two triangles for each gear.
The left triangle is controlled by LGCIU 1, the right one by LGCIU 2.

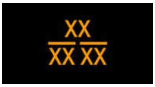


The LGCIU detects the associated landing gear as locked down.



The LGCIU detects the associated landing gear as in transit.

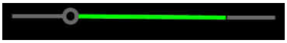
The LGCIU detects the associated landing gear as retracted and uplocked.



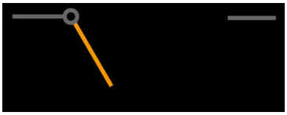
The LGCIU is failed.

Note: *When the landing gear lever is down, one LGCIU locked down indication (one green triangle per gear) is sufficient to indicate that the landing gear is down and locked.*

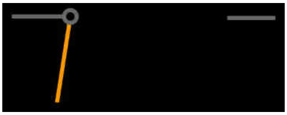
LANDING GEAR DOOR INDICATION



The associated landing gear door is closed and uplocked.



The associated landing gear door is in transit.



The associated landing gear door is open.

MEMO DISPLAY

Ident.: DSC-32-10-30-00017131.0001001 / 05 MAY 22
Applicable to: ALL

FLT L/G DOWN : This memo appears in green if the aircraft is operated in "flight with landing gear down" configuration.

DESCRIPTION

Ident.: DSC-32-20-10-00000618.0006001 / 09 OCT 12

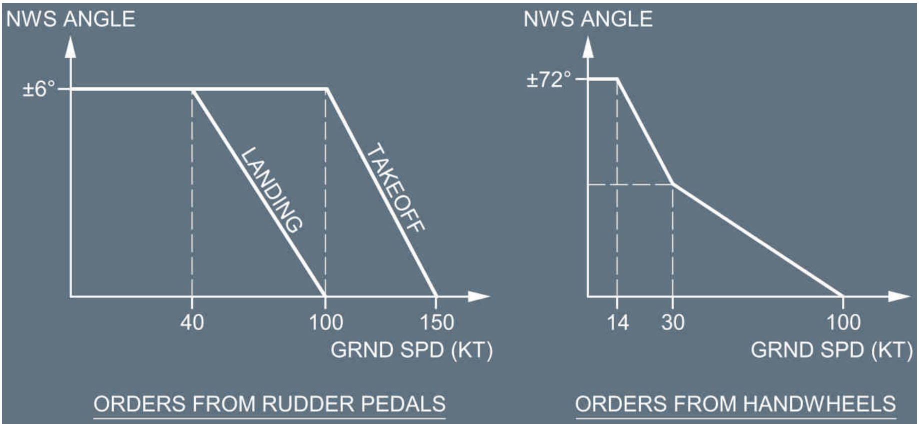
1 **Applicable to: LV-KAN**

Nose wheel steering is provided by two actuators, powered by the green hydraulic system and electrically-signalled by the Brake and Steering Control Unit (BSCU).

The BSCU has two independent systems. Only one is active at a time, while the other is on standby.

To control the steering the BSCU receives inputs from the steering hand wheels, the rudder pedals, and the Auto Pilot.

The BSCU transforms the pilot order into a nose wheels steering angle by controlling the servo-valve to provide the requested flow for the hydraulic actuators. The following limitations apply:



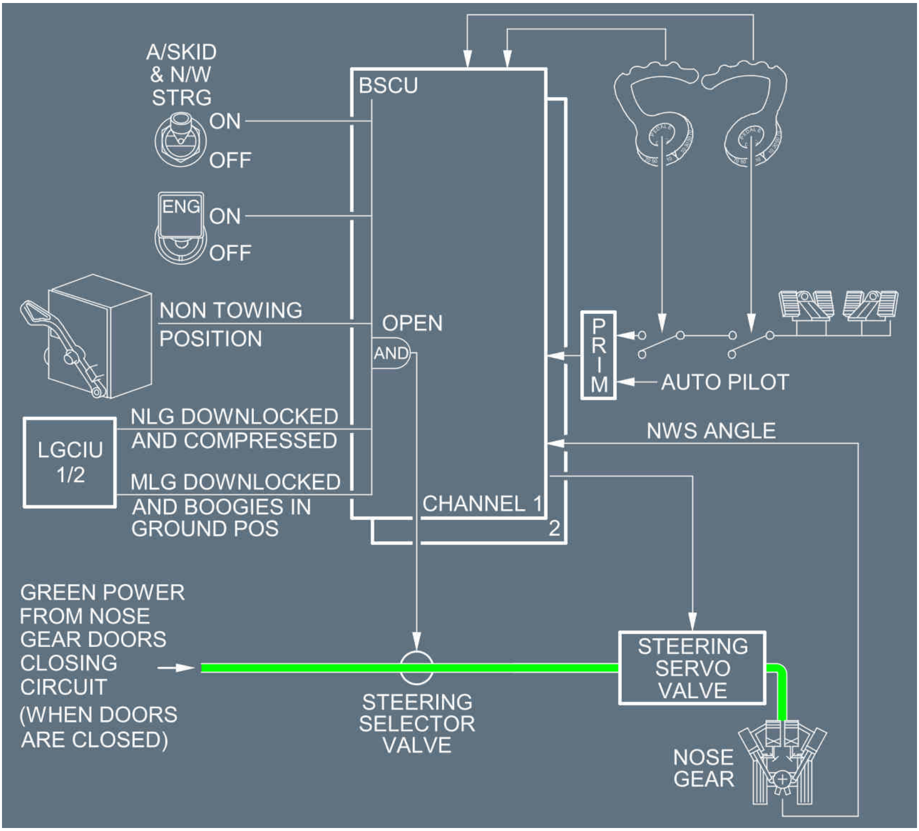
The steering handwheels control the nosewheel steering angle up to ±72 ° in either direction.

A lever on the towing electrical box (on the nose L/G) enables the steering system to be deactivated for towing purposes.

A visual red warning on the overhead panel indicates to the crew that an oversteer (±93 °) has occurred.

Pilots can disconnect the rudder pedal order to the BSCU, through a pushbutton located on each steering hand wheel.

An internal cam mechanism returns the nose wheel to the centered position after takeoff.


A/SKID
& N/W
STRG
ON
OFF
ENG
ON
OFF
NON TOWING
POSITION
OPEN
AND
LGCIU
1/2
NLG DOWNLOCKED
AND COMPRESSED
MLG DOWNLOCKED
AND BOOGIES IN
GROUND POS
BSCU
CHANNEL 1
2
PRIM
AUTO PILOT
NWS ANGLE
GREEN POWER
FROM NOSE
GEAR DOORS
CLOSING
CIRCUIT
(WHEN DOORS
ARE CLOSED)
STEERING
SELECTOR
VALVE
STEERING
SERVO
VALVE
NOSE
GEAR

DESCRIPTION

Ident.: DSC-32-20-10-00000618.0005001 / 09 OCT 12

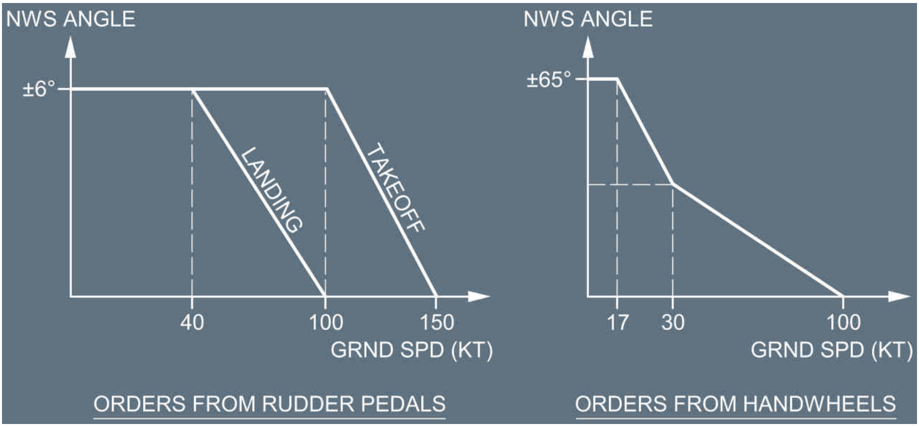
2 **Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU**

Nose wheel steering is provided by two actuators, powered by the green hydraulic system and electrically-signalled by the Brake and Steering Control Unit (BSCU).

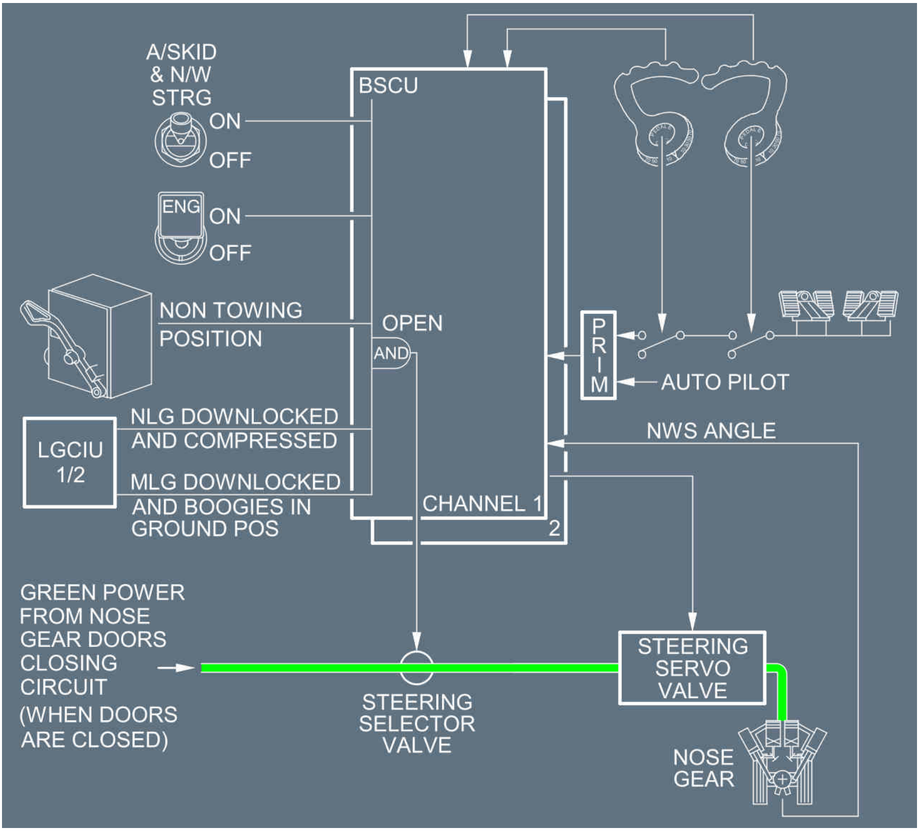
The BSCU has two independent systems. Only one is active at a time, while the other is on standby.

To control the steering the BSCU receives inputs from the steering hand wheels, the rudder pedals, and the Auto Pilot.

The BSCU transforms the pilot order into a nose wheels steering angle by controlling the servo-valve to provide the requested flow for the hydraulic actuators. The following limitations apply:



The steering hand wheels control the nose wheel steering angle up to ±65 ° in either direction.
A lever on the towing electrical box (on the nose L/G) enables the steering system to be deactivated for towing purpose.
A visual red warning on the overhead panel indicates to the crew that an oversteer (±93 °) has occurred.
Pilots can disconnect the rudder pedal order to the BSCU, through a pushbutton located on each steering hand wheel.
An internal cam mechanism returns the nose wheel to the centered position after takeoff.


A/SKID & N/W STRG
ON
OFF
ENG
ON
OFF
NON TOWING POSITION
OPEN
AND
LGCIU 1/2
NLG DOWNLOCKED AND COMPRESSED
MLG DOWNLOCKED AND BOOGIES IN GROUND POS
BSCU
CHANNEL 1
2
PRIM
AUTO PILOT
NWS ANGLE
GREEN POWER FROM NOSE GEAR DOORS CLOSING CIRCUIT (WHEN DOORS ARE CLOSED)
STEERING SELECTOR VALVE
STEERING SERVO VALVE
NOSE GEAR

RUDDER PEDALS

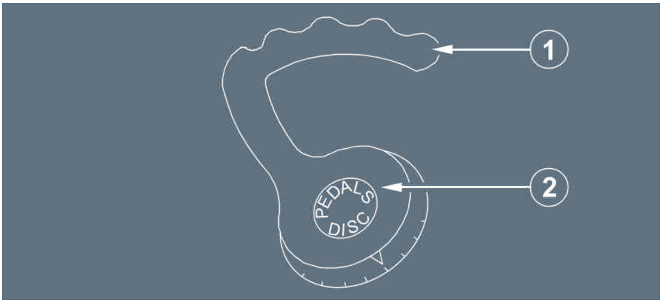
Ident.: DSC-32-20-20-00018905.0001001 / 21 MAR 16
Applicable to: ALL

Nosewheel steering control authority depends on aircraft speed. Rudder pedals provide nosewheel steering control when:
- The speed is below 100 kt at landing, or
- Up to 150 kt for takeoff.

Note: The nosewheel steering angle depends on aircraft speed, and will return to zero if the aircraft is above these speeds.

SIDE CONSOLES

Ident.: DSC-32-20-20-00000629.0001001 / 09 OCT 12
1 **Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU**

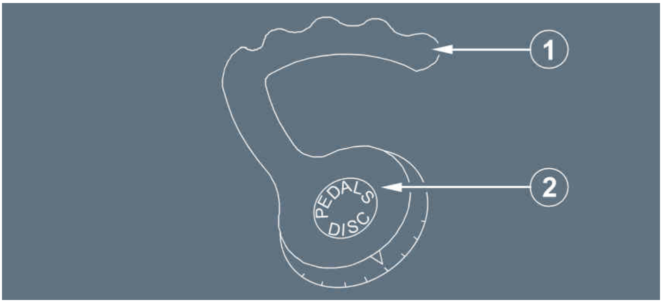


(1) STEERING HANDWHEELS
The steering handwheels provide nose wheel steering control below 100 kt, and up to 65 ° left or right.

(2) RUDDER PEDAL DISC pb
When maintained depressed, the nose wheel steering control by the pedals is disconnected.

SIDE CONSOLES

Ident.: DSC-32-20-20-00000629.0002001 / 09 OCT 12
2 **Applicable to: LV-KAN**

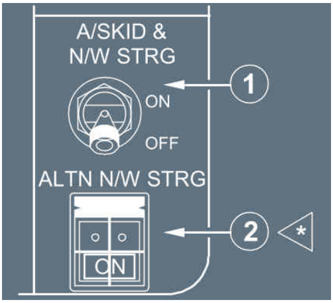


(1) STEERING HANDWHEELS
The steering handweels provide nosewheel steering control below 100 kt, and up to 72 ° left or right.

(2) RUDDER PEDAL DISC pb
When maintained depressed, the nosewheel steering control by the pedal is disconnected.

CENTER INSTRUMENT PANEL

Ident.: DSC-32-20-20-00018907.0004001 / 21 MAR 16
Applicable to: ALL



(1) A/SKD & N/W STRG sw
An ON/OFF switch activates or deactivates the Nosewheel Steering and Anti-Skid (*Refer to DSC-32-30-10 General*).

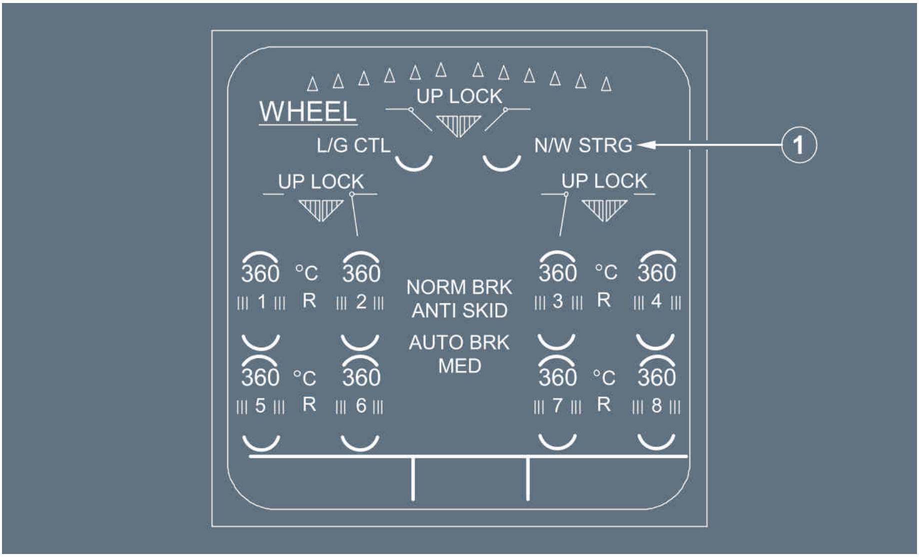
(2) ALTN N/W STRG pb ◁ (guarded pushbutton to be used on ground only)

ON : The Yellow hydraulic system supplies the nosewheel steering. This function and the ON light are inhibited when the aircraft speed is above 70 kt.

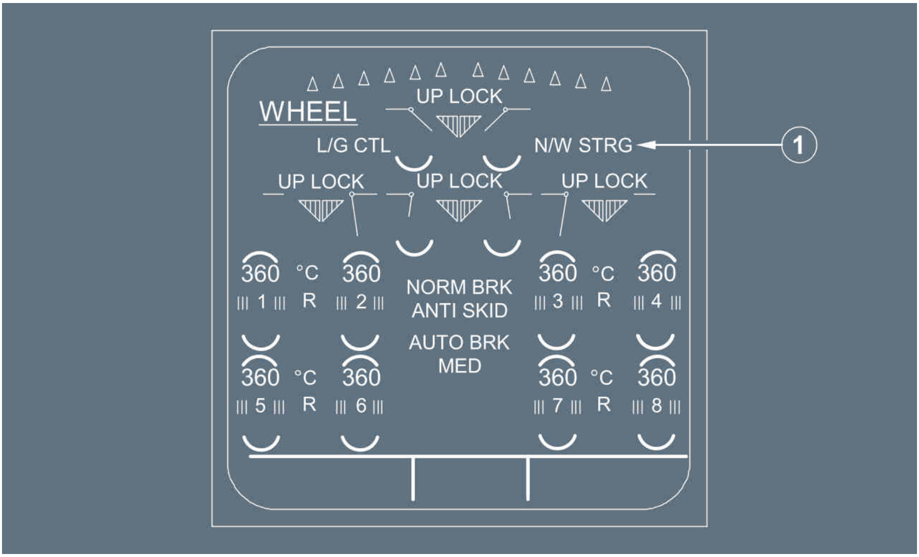
WHEEL SD PAGE

Ident.: DSC-32-20-20-00018909.0001001 / 21 MAR 16
Applicable to: ALL

For A330


WHEEL
UP LOCK
L/G CTL
N/W STRG
1
UP LOCK
UP LOCK
360 °C 360
1 R 2
NORM BRK
ANTI SKID
360 °C 360
3 R 4
AUTO BRK
MED
360 °C 360
5 R 6
360 °C 360
7 R 8

For A340

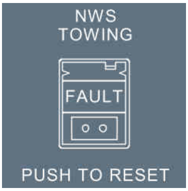

WHEEL
UP LOCK
L/G CTL
N/W STRG
1
UP LOCK
UP LOCK
UP LOCK
360 °C 360
1 R 2
360 °C 360
3 R 4
NORM BRK
ANTI SKID
AUTO BRK
MED
360 °C 360
5 R 6
360 °C 360
7 R 8

(1) N/W STRG indication

Appears amber in case of:
- Nose wheel steering failure detected by the BSCU (associated with an ECAM caution), or
- A/SKID & N/W STRG sw is OFF, or
- Failure of both BSCU channels (associated with ECAM caution).

MAINTENANCE PANEL

Ident.: DSC-32-20-20-00018908.0001001 / 21 MAR 16
Applicable to: ALL


NWS
TOWING
FAULT
PUSH TO RESET

NWS TOWING pb (guarded)

FAUT : On ground, it comes on red when the nosewheel steering has exceeded 93 ° . It is associated with the illumination of the red oversteer warning light, located on the nose landing gear. When pressed, the light goes out.

MEMO DISPLAY

Ident.: DSC-32-20-20-00017135.0002001 / 21 MAR 16
Applicable to: ALL

N/WS DISC : This memo appears in green if the nose wheel steering lever is in the towing position.

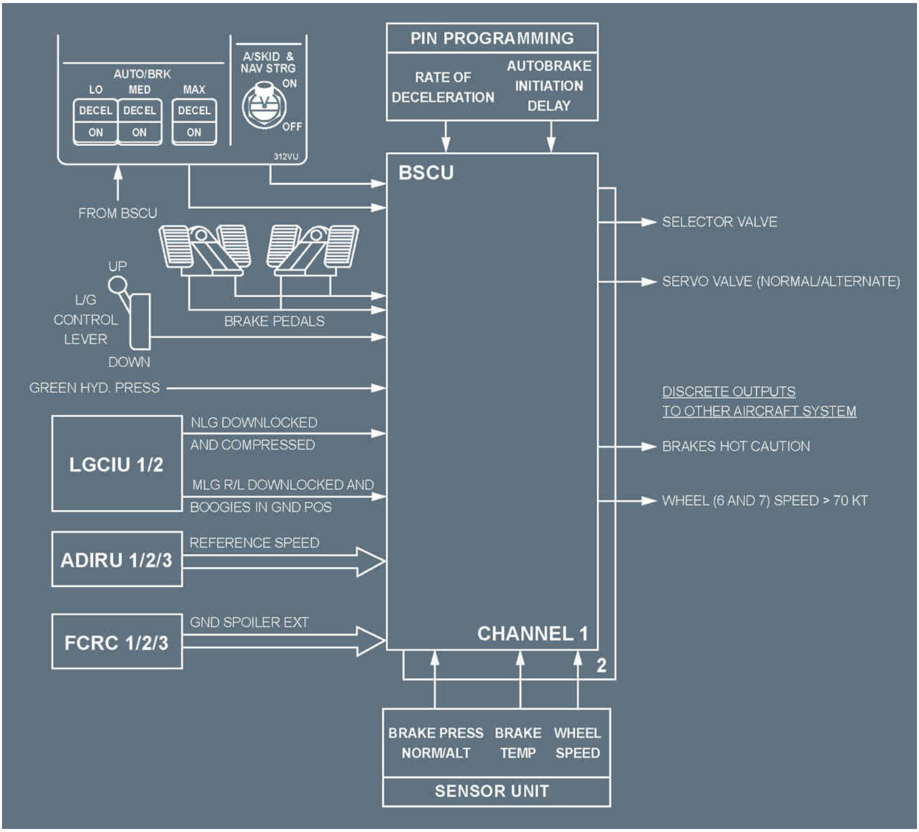
N/WS DISC : This memo appears in amber if one engine is running.

Intentionally left blank

GENERAL

Ident.: DSC-32-30-10-00018913.0001001 / 21 MAR 16
Applicable to: ALL

The main wheels are equipped with carbon multidisc brakes, which can be actuated by either of two independent brake systems.
The normal system uses green hydraulic pressure, whilst the alternate system uses the blue hydraulic system (backed up by the hydraulic accumulator).
An antiskid and autobrake system is also provided.


AUTO/BRK
LO
MED
MAX
DECEL
ON
DECEL
ON
DECEL
ON
A/SKID &
NAV STRG
ON
OFF
312VU
FROM BSCU
PIN PROGRAMMING
RATE OF
DECELERATION
AUTOBRAKE
INITIATION
DELAY
BSCU
UP
L/G
CONTROL
LEVER
DOWN
BRAKE PEDALS
GREEN HYD. PRESS
LGCIU 1/2
NLG DOWNLOCKED
AND COMPRESSED
MLG R/L DOWNLOCKED AND
BOOGIES IN GND POS
ADIRU 1/2/3
REFERENCE SPEED
FCRC 1/2/3
GND SPOILER EXT
CHANNEL 1
2
SELECTOR VALVE
SERVO VALVE (NORMAL/ALTERNATE)
DISCRETE OUTPUTS
TO OTHER AIRCRAFT SYSTEM
BRAKES HOT CAUTION
WHEEL (6 AND 7) SPEED > 70 KT
BRAKE PRESS
NORM/ALT
BRAKE
TEMP
WHEEL
SPEED
SENSOR UNIT

Braking commands come from either the brake pedals (pilot action), or the autobrake system (deceleration rate selected by the crew).

A dual channel Brake and Steering Control Unit (BSCU) controls all braking modes and functions which are the following :

- Normal braking
- Alternate braking
- Autobrake
- Antiskid.

The BSCU performs the following secondary functions:
- Checks the residual pressure in the brakes
- Monitors brake temperature
- Provides discrete wheel speed information to other aircraft systems.

A changeover between the two BSCU systems takes place at each DOWN landing lever selection, or in case one system fails.
The main gear wheels are fitted with fusible plugs which protect against tire burst in the event of overheat.
Main gear wheels are also equipped with brake cooling fans ◁ , which permit a high speed cooling of the brakes.

ANTISKID SYSTEM

Ident.: DSC-32-30-10-00018914.0001001 / 21 MAR 16
Applicable to: ALL

The antiskid system provides maximum braking efficiency by maintaining the wheels at the limit of an impending skid.
At skid start, brake release orders are sent to:

- Normal servovalves
- Alternate servovalves
- ECAM system which displays the released brakes.

Without using autobrake, full braking performance is achieved only with brake pedals at full deflection.
The antiskid system is deactivated below 10 kt (ground speed). For A340-500/600, below 10 kt (ground speed), the antiskid system is only operative during hard braking.
An ON/OFF switch activates or deactivates the antiskid system.

A/SKID PRINCIPLE

The A/SKID system compares the speed of each MLG wheel (and NLG wheel for A340-500/600) given by a tachometer with the aircraft speed called reference speed.
When the speed of a wheel decreases below 0.88 time the reference speed, brake release orders are given to maintain the wheel speed at the value (best braking efficiency).

In normal operation, the reference speed is determined by BSCU from the horizontal acceleration from ADIRU1 or ADIRU2 or ADIRU3.
In case all ADIRUs are failed, reference speed equals the maximum of either landing gear wheel speeds.

AUTOBRAKE

Ident.: DSC-32-30-10-A-00018916.0001001 / 21 MAR 16
Applicable to: ALL

The A/BRK is a function that automatically decelerates the aircraft during landing, or in the case of a rejected takeoff (RTO). The A/BRK:

- Avoids any delay for brake application in the case of an RTO
- Reduces flight crew workload during landing, by maintaining a constant deceleration rate
- Reduces the number of brake applications, and therefore, brake wear.

Ident.: DSC-32-30-10-A-00018918.0006001 / 21 MAR 17
Applicable to: LV-GIF

SYSTEM ARMING

The crew may arm the system by pressing the LO, MED, or MAX pushbutton provided all the following arming conditions are met :
- Green pressure available
- Antiskid electrically-powered
- No failure in the braking system
- At least two PRIMs are available and able to command the ground spoilers extension
- At least one ADIRU available.

Note: *Autobrake may be armed with the parking brake on.*

The armed AUTO BRK mode is displayed in blue on the Flight Mode Annunciator (FMA).

Ident.: DSC-32-30-10-A-00018918.0007001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

SYSTEM ARMING

The crew may arm the system by pressing the LO, MED, or MAX pushbutton provided all the following arming conditions are met :
- Green pressure available
- Antiskid electrically-powered
- No failure in the braking system
- At least two PRIMs are available and able to command the ground spoilers extension
- At least one ADIRU available.

Note: Autobrake may be armed with the parking brake on.

Ident.: DSC-32-30-10-A-00018919.0007001 / 17 OCT 17
Applicable to: LV-GIF

SYSTEM ACTIVATION

Automatic braking is activated:
- At the command for ground spoilers extension (*Refer to DSC-27-10-20 Speedbrake and Ground Spoiler Control - Speedbrake Control*), for LO and MED modes, or
- At the command for ground spoilers extension, when the wheel speed is above 40 kt and when the nose landing gear is compressed, for MAX mode.

Consequently in the event of an acceleration stop, if the deceleration is initiated with the wheel speed below 72 kt, the automatic braking will not activate because the ground spoilers will not be extended.
The active AUTO BRK mode is displayed in green on the Flight Mode Annunciator (FMA).

Ident.: DSC-32-30-10-A-00018919.0008001 / 17 OCT 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

SYSTEM ACTIVATION

Automatic braking is activated:
- At the command for ground spoilers extension (*Refer to DSC-27-10-20 Speedbrake and Ground Spoiler Control - Speedbrake Control*), for LO and MED modes, or
- At the command for ground spoilers extension, when the wheel speed is above 40 kt and when the nose landing gear is compressed, for MAX mode.

Consequently in the event of an acceleration stop, if the deceleration is initiated with the wheel speed below 72 kt, the automatic braking will not activate because the ground spoilers will not be extended.

Ident.: DSC-32-30-10-A-00018920.0005001 / 21 MAR 17
Applicable to: ALL

SYSTEM DEACTIVATION

The system deactivates when :
- Autobrake is disarmed (*Refer to DSC-32-30-10 System Disarming*), or
- Landing roll is completed and ground spoilers retract. In this case, LO or MED mode is also disarmed.

Ident.: DSC-32-30-10-A-00018921.0001001 / 21 MAR 16
Applicable to: ALL

SYSTEM DISARMING

The system is disarmed by :
- Pressing the pushbutton of the corresponding armed autobrake mode, or
- Losing one or more arming conditions, or
- Applying sufficient deflection to at least one brake pedal when autobrake is active in MAX, MED or LO mode, or
- After takeoff, or touch and go.

OPERATION

Applicable to: ALL

Ident.: DSC-32-30-10-B-00018922.0001001 / 21 MAR 16

GENERAL

There are four operation modes which are:
- Normal braking
- Alternate braking with antiskid
- Alternate braking without antiskid
- Parking brake.

Ident.: DSC-32-30-10-B-00000869.0002001 / 21 MAR 16

NORMAL BRAKING

Antiskid is operative and autobrake is available.

Braking is normal when:
- Green hydraulic pressure is available
- main landing gear in ground condition
- A/SKID and N/W STRG switch is ON

The control is electrically- achieved through the BSCU either via :
- The pedals, or
- Automatically:
  - on ground by autobrake system
  - in flight by setting the landing gear lever to the up position

The antiskid system is controlled by the BSCU, via the normal servo valves.
No brake pressure indication is provided.

Ident.: DSC-32-30-10-B-00018924.0001001 / 17 MAR 17

ALTERNATE BRAKING WITH ANTISKID

Autobrake is inoperative.

Active when green hydraulic pressure is insufficient and provided :
- Blue hydraulic pressure is available
- A/SKID & N/W STRG sw is ON
- PARKING BRAKE is not ON.

Note: *Alternate braking is also active in flight, when the landing gear is up.*

The automatic switching between the green and blue system is achieved by an automatic hydraulic selector.
Control is achieved by the pedals through the auxiliary low hydraulic pressure distribution line acting on the dual valves. The BSCU controls antiskid system via the alternate servo valves.
Brake pressure, as well as accumulator pressure, are indicated on a triple indicator located on the center instrument panel.

Note: *Initial pedal force or displacement produces more braking action in alternate mode than in normal mode.*

Ident.: DSC-32-30-10-B-00018925.0001001 / 17 MAR 17

ALTERNATE BRAKING WITHOUT ANTISKID

Autobrake and antiskid are inoperative.

The antiskid system is either deactivated:
- Electrically (A/SKID & N/W STRG sw is OFF, or power supply failure, or BSCU failure), or
- Hydraulically (B + G system low pressure, the brakes are supplied by the brake accumulator only).

Control is achieved by the pedals (acting on the dual valves). Alternate servo valves are fully open.
Brake pressure and accumulator pressure are indicated on a triple indicator, located on the center instrument panel. The pilot must modulate brake pressure at, or below, 1 000 PSI in order to avoid wheel locking.
Accumulators are designed to supply at least 7 full brake applications.

Note: *Initial pedal force or displacement produces more braking action in alternate mode than in normal mode.*

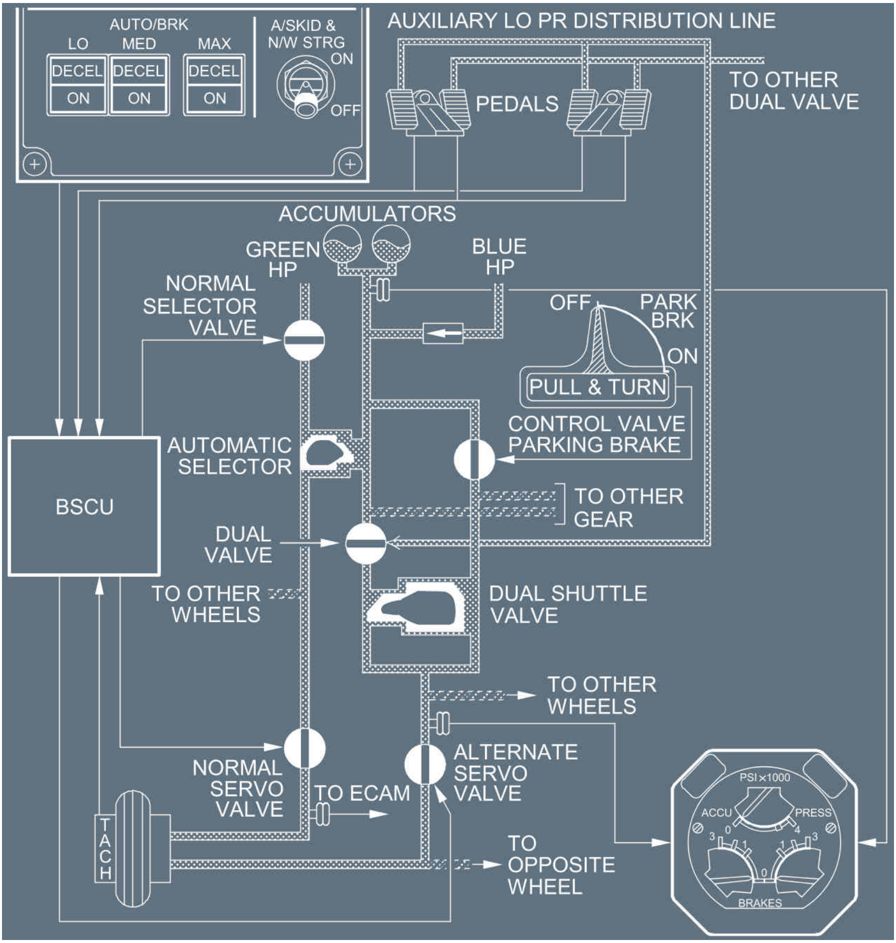
Ident.: DSC-32-30-10-B-00000872.0001001 / 21 MAR 16

PARKING BRAKE

Brakes are supplied by the blue hydraulic system, or by accumulator pressure via the dual shuttle valves. Alternate servo valves are open allowing full pressure application.
The accumulator maintains the parking pressure for at least 12 h.
If the parking brake is activated and no blue hydraulic or accumulator brake pressure is available, then the normal braking system can be applied via the brake pedals.
Blue accumulators can be pressurized by pressing the blue electrical pump switch. Brake pressure, as well as accumulator pressure, are indicated on a triple indicator located on the center instrument panel.

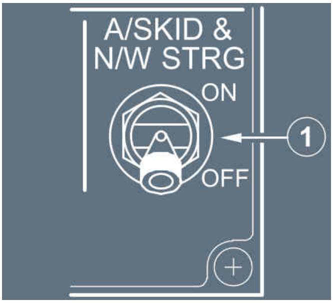
Ident.: DSC-32-30-10-B-00018927.0001001 / 21 MAR 16

BRAKING SCHEMATIC


AUTO/BRK
LO
MED
MAX
DECEL
ON
DECEL
ON
DECEL
ON
A/SKID &
N/W STRG
ON
OFF
AUXILIARY LO PR DISTRIBUTION LINE
PEDALS
TO OTHER
DUAL VALVE
ACCUMULATORS
GREEN
HP
BLUE
HP
NORMAL
SELECTOR
VALVE
OFF
PARK
BRK
ON
PULL & TURN
CONTROL VALVE
PARKING BRAKE
BSCU
AUTOMATIC
SELECTOR
TO OTHER
GEAR
DUAL
VALVE
TO OTHER
WHEELS
DUAL SHUTTLE
VALVE
TO OTHER
WHEELS
NORMAL
SERVO
VALVE
TO ECAM
ALTERNATE
SERVO
VALVE
TACH
TO
OPPOSITE
WHEEL
PSI x1000
ACCU
PRESS
0
1
3
4
BRAKES

CENTER INSTRUMENT PANEL

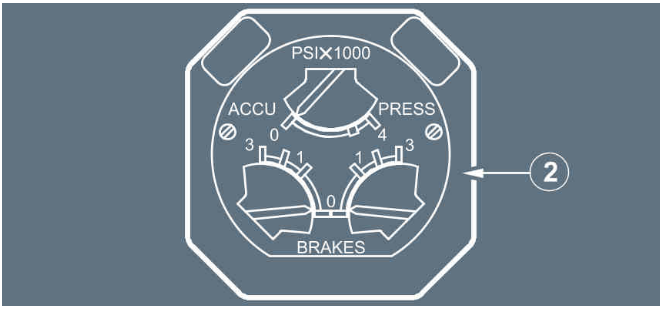
Ident.: DSC-32-30-20-00018931.0002001 / 21 MAR 16
Applicable to: ALL



(1) A/SKID & N/W STRG sw

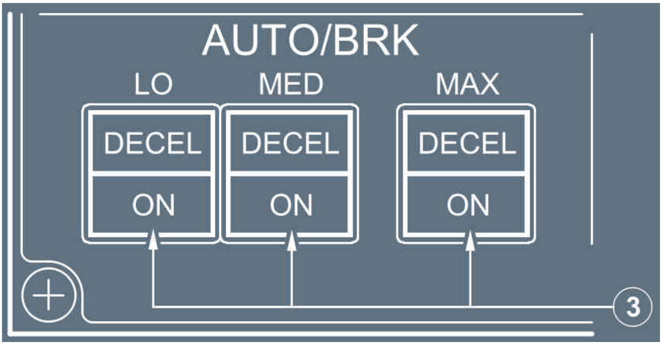
ON : - If green hydraulic pressure is available, antiskid and nose wheel steering are available.
- If green hydraulic pressure is lost:
  - Blue hydraulic pressure automatically takes over to supply the brakes
  - Antiskid remains available
  - Nose wheel steering is lost
  - Brake blue pressure is displayed on the triple indicator.

OFF : - Blue hydraulic pressure supplies the brakes:
  - Antiskid is deactivated. Brake pressure has to be limited by the pilot by refering to the triple indicator to avoid wheel locking
  - Nose wheel steering is lost
  - Differential braking remains available by pedals
  - Brake blue pressure is displayed on the triple indicator.



(2) BRAKES and ACCU PRESS indicator

ACCU PRESS indication	:	- green band	:	allowed pressure area in the brake accumulators. Provides full pressure to the brakes.
		- amber band	:	forbidden pressure area. Necessitates a repressurization of the accumulators.
BRAKES pressure indication	:	Indicates blue pressure delivered to left and right brakes measured upstream of the alternate servovalves.		



(3) AUTO BRK panel

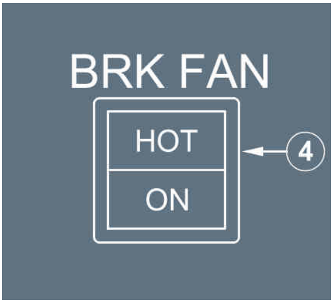
The springloaded MAX, MED, and LO pushbutton switches arm the appropriate deceleration rate:

- MAX mode is normally selected for take off.
  In the case of an aborted takeoff, maximum pressure goes to the brakes, as soon as the system generates the ground spoiler deployment order.
- MED or LO mode is normally selected for landing.
  - When LO is selected, progressive pressure goes to the brakes 1 s after ground spoiler deployment order, in order to decelerate the aircraft at 1.8 m/s^2 (5.9 ft/s^2).
  - When MED is selected, progressive pressure goes to the brakes starting at ground spoiler deployment order, in order to decelerate the aircraft at 3 m/s^2 (9.8 ft/s^2).

ON : The ON light illuminates blue to indicate positive arming.
The DECEL light illuminates green only if the autobrake function is active and when actual aircraft deceleration corresponds to predetermined rate. (In LO or MED : 80 % of the selected rate ; in MAX : 2.65 m/s² (8.7 ft/s²)). This occurs approximately 8 (5) seconds after activation for LO (MED) using only the brakes. Predetermined rates can also be achieved by using only the reversers or a combination of both reversers and brakes.

Note: *On a slippery runway, the predetermined deceleration may not be reached due to the slippery runway condition. In this case, the DECEL light will not come on, even if autobrake is active (ACTIV light ON).*

Off : The corresponding autobrake mode is not armed.



(4) BRK FAN pb ◁✳

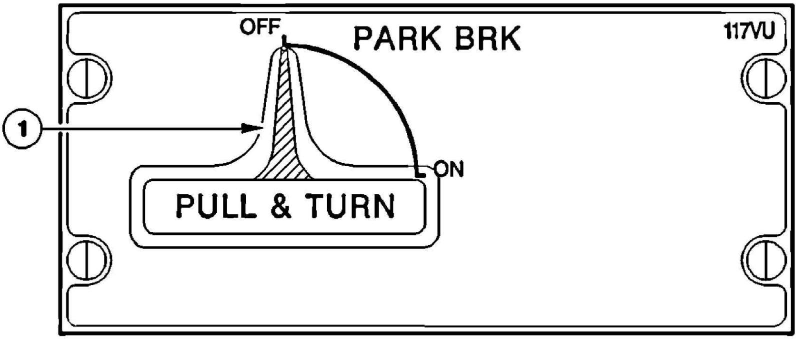
ON : The brake fans run, provided the main landing gear is downlocked.
The ON legend comes on in white.

Off : The brake fans stop.

HOT lt : Comes on amber, along with the associated ECAM caution, when one brake temperature exceeds 300 °C.

PEDESTAL

Ident.: DSC-32-30-20-00018932.0001001 / 21 MAR 16
Applicable to: ALL

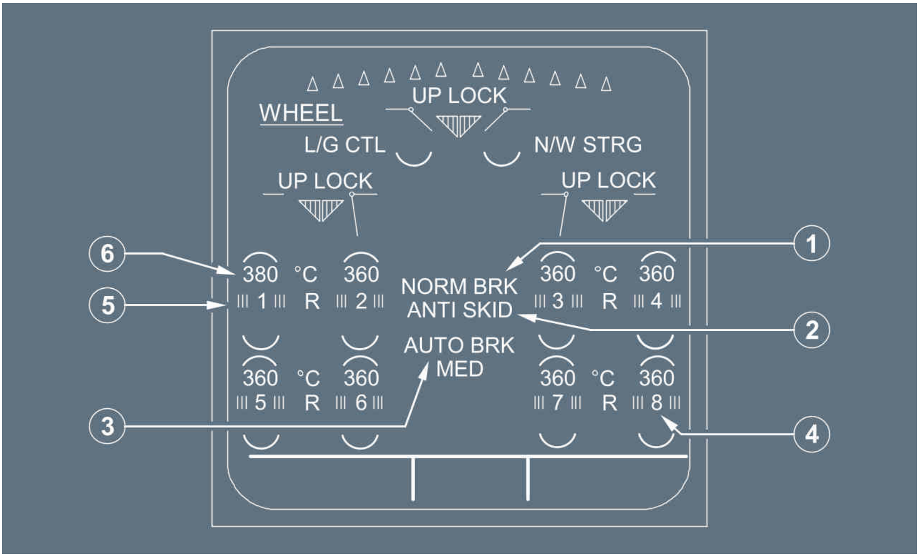


(1) PARK BRK handle
Pull the handle, then turn it clockwise to apply the parking brake.
For A340-500/600, the activation of the parking brake deactivates all the other braking modes.
The "PARK BRK" message is displayed on the ECAM memo page.

CAUTION	As long as the handle is not in the "ON" position, the parking brake is not applied.

WHEEL SD PAGE

Ident.: DSC-32-30-20-00018933.0001001 / 21 MAR 16
Applicable to: ALL


WHEEL
UP LOCK
L/G CTL
N/W STRG
UP LOCK
UP LOCK
380 °C 360
1 R 2
360 °C 360
3 R 4
NORM BRK
ANTI SKID
AUTO BRK
MED
360 °C 360
5 R 6
360 °C 360
7 R 8
1
2
3
4
5
6

(1) NORM BRK indication

Appears in amber in case of:
- Normal braking is failed, or
- A/SKID & NWS sw is at OFF (associated with ECAM caution), or
- Both BSCU channels are failed (associated with ECAM caution).

(2) ANTISKID indication

Appears amber associated with an ECAM caution in case of total BSCU failure or when the A/SKID & NWS sw is OFF or in case of anti-skid failure detected by the BSCU or in flight with at least one engine running when green and blue systems are failed.

(3) AUTO BRK indication

Displayed :
- In green when the autobrake is armed.
- In amber and an associated ECAM caution comes on in case of autobrake system failure, or failure of both BSCU channels.

MAX, MED or LO indicates the selected rate (green). It is not displayed when the autobrake is faulty.

(4) Wheel number identification
Indication is displayed in white.

(5) III indications

It appears in green when:
- In flight, the landing gear is extended, and the antiskid is valid, or
- On ground, when antiskid is activated and the brakes are released.

It is amber in case of:
- Residual pressure, or
- Brake release fault.

Note: The III indications do not appear if the Alternate Nose Wheel Steering is active (i.e. if the ALTN NWS pb is switched to ON).

The R (Release) indication is always in white.

(6) Brake temperature indications

- It is normally green (minimum indication 0 °C).
- The green arc appears on the hottest wheel, when one brake temperature exceeds 100 °C.
- The amber light, and associated ECAM caution, come on when the corresponding brake temperature exceeds 300 °C.
  In addition, on the hottest wheel, the arc becomes amber.

Note: Below 100 °C, the indicated brake temperature may be below the actual brake temperature. This difference can reach 25 °C with an actual brake temperature of 30 °C, and it decreases when the temperature increases.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-32-30-20-A-00017137.0001001 / 21 MAR 16

BRK FAN : This memo appears in green, if the BRK FAN pb is ON.

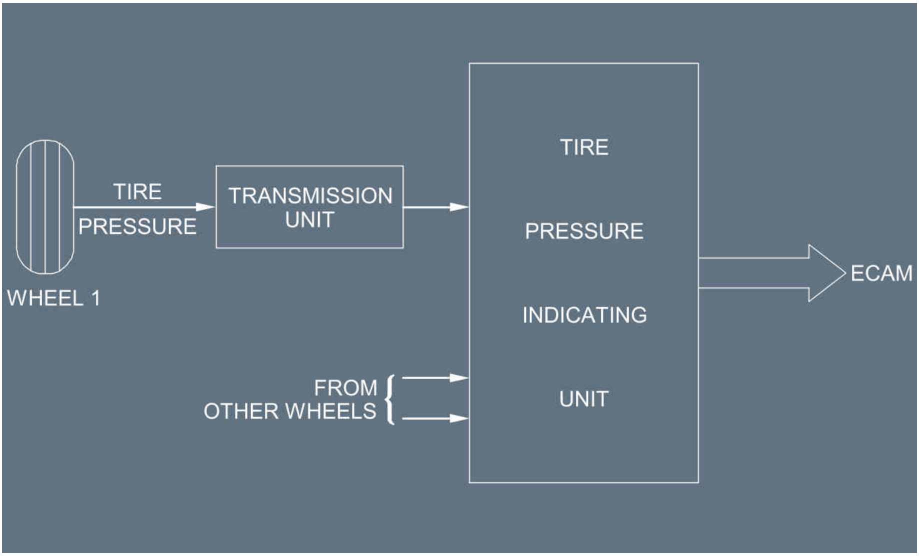
Ident.: DSC-32-30-20-A-00017136.0001001 / 21 MAR 16

PARK BRK : This memo appears in green when the aircraft is on ground (during flight phases 1, 2, 9 and 10) and the parking brake is ON, .

GENERAL

Ident.: DSC-32-40-10-00018936.0004001 / 21 MAR 16
Applicable to: ALL

The Tire Pressure Indicating System (TPIS) includes:
- A sensor which measures the pressure of each tire
- A transmission unit which transmits the electrical pressure signal from the sensor to the computer
- A Tire Pressure Indicating Unit (TPIU) which sends informations to the ECAM for cautions and system page display.


TIRE
PRESSURE
WHEEL 1
TRANSMISSION UNIT
TIRE PRESSURE INDICATING UNIT
ECAM
FROM OTHER WHEELS

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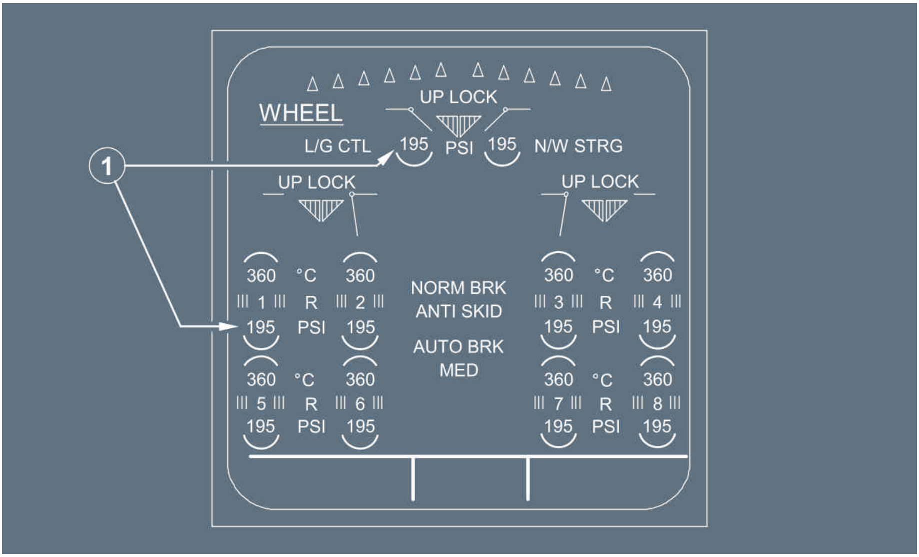
WHEEL SD PAGE

Ident.: DSC-32-40-20-00018937.0005001 / 21 MAR 16
Applicable to: ALL


1
WHEEL
UP LOCK
L/G CTL
195
PSI
195
N/W STRG
UP LOCK
UP LOCK
360 °C 360
1 R 2
195 PSI 195
360 °C 360
5 R 6
195 PSI 195
NORM BRK
ANTI SKID
AUTO BRK
MED
360 °C 360
3 R 4
195 PSI 195
360 °C 360
7 R 8
195 PSI 195

(1) Tire pressure indication
Indication is green.
Becomes amber associated with an ECAM caution when tire low pressure is detected.

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AIRCRAFT SYSTEMS

LIGHTS

Intentionally left blank

DSC-33-10 Cockpit Lighting

DSC-33-10-10 General

General.....A

DSC-33-10-20 Description

Description.....A

DSC-33-10-30 Controls and Indicators

Overhead Panel.....A
Pedestal.....B
Glareshield.....C
Main Instrument Panel.....D
Left Rear Panel.....E

DSC-33-20 Exterior Lighting

DSC-33-20-10 General

General.....A

DSC-33-20-20 Controls and Indicators

Controls and Indicators.....A
Overhead Panel.....B
Memo Display.....C

DSC-33-30 Emergency Lighting

DSC-33-30-10 General

General.....A

DSC-33-30-20 Operation

Operation.....A

DSC-33-30-30 Controls and Indicators

Overhead Panel.....A

DSC-33-40 Signs

DSC-33-40-10 Controls and Indicators

Overhead Panel.....A
Overhead Panel (cont'd).....B
Memo Display.....C

Intentionally left blank

GENERAL

Ident.: DSC-33-10-10-00018004.0001001 / 21 MAR 16
Applicable to: ALL

The instrument panel has both integral instrument lighting and flood lighting.
The brightness of all panel lighting is adjustable.
Spot lights and flood lights provide lighting for all work surfaces and the side consoles.
Two dimmable dome lights provide lighting for the overall cockpit.

Intentionally left blank

DESCRIPTION

Ident.: DSC-33-10-20-00000677.0002001 / 06 JAN 16
Applicable to: LV-GKO, LV-GKP

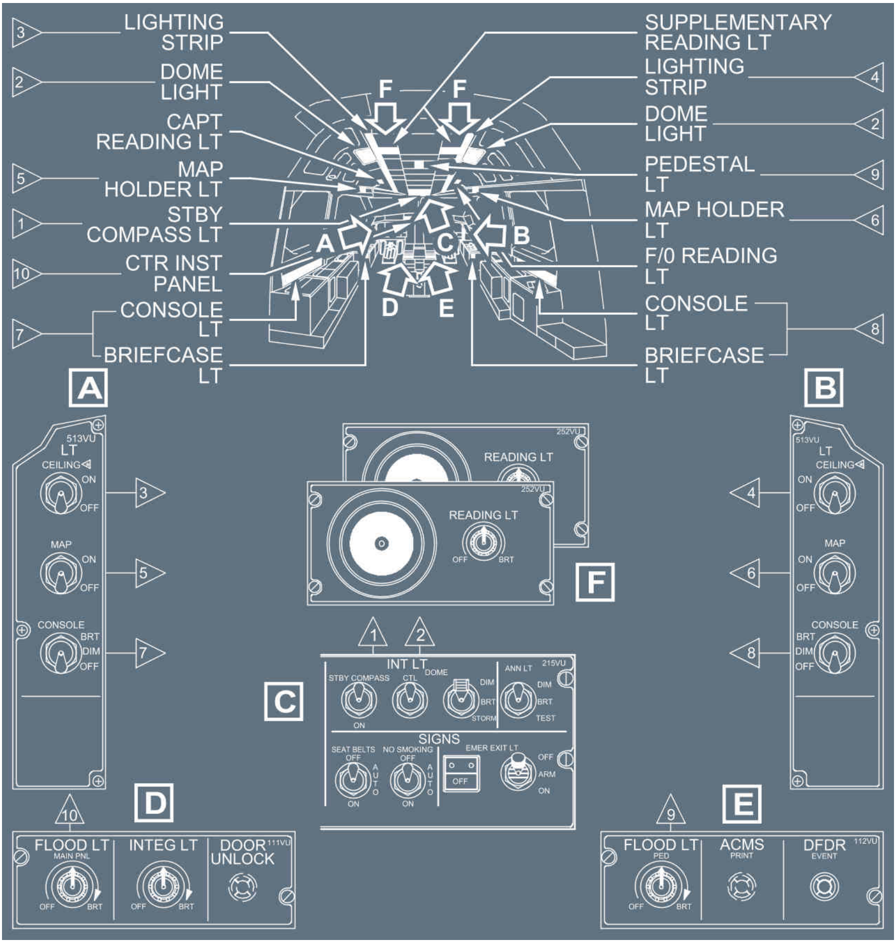
INSTRUMENT AND PANEL INTEGRATED LIGHTING

All instruments and panels installed in the cockpit (other than the DU) are integrally lit.
The brightness of all instruments and panels can be adjusted.

ANNUNCIATOR LIGHT TEST AND DIMMING

The brightness of all the annunciator lights in the flight deck can be adjusted, depending on the ANN LT TEST / BRT / DIM sw position on the overhead panel.
The lights are dimmed to a fixed level.
An annunciator light test is provided to verify cockpit annunciator lamp operation.
The test is done by selecting the TEST position on the ANN LT «TEST / BRT / DIM» sw, and by visually checking that all lights illuminate.

COCKPIT LIGHTING


LIGHTING STRIP
DOME LIGHT
CAPT READING LT
MAP HOLDER LT
STBY COMPASS LT
CTR INST PANEL
CONSOLE LT
BRIEFCASE LT
SUPPLEMENTARY READING LT
LIGHTING STRIP
DOME LIGHT
PEDESTAL LT
MAP HOLDER LT
F/0 READING LT
CONSOLE LT
BRIEFCASE LT
1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
513VU
LT
CEILING
ON
OFF
MAP
CONSOLE
BRT
DIM
252VU
READING LT
215VU
INT LT
STBY COMPASS
DOME
CTL
STORM
TEST
ANN LT
SIGNS
SEAT BELTS
NO SMOKING
AUTO
EMER EXIT LT
ARM
111VU
FLOOD LT
MAIN PNL
INTEG LT
DOOR UNLOCK
112VU
PED
ACMS
PRINT
DFDR
EVENT

(2, 3, 4) Dome lights and lighting strips:
Two dome lights and lighting strips supply general cockpit illumination providing shadow free lighting.

(5, 6) Map holder lighting:
Map chart holder is provided at the CAPT and F/O stations.

(7, 8) Console and floor lighting:
Briefcase stowage, side console, and floor lighting are provided at the CAPT and F/O stations.

(1, 10) Centre instrument panel and standby compass:
The centre instrument panel is lighted by a set of lights located below the glareshield. The standby compass is provided with integral illumination.

(F) Reading lights:
Individual reading lights, and supplementary reading lights, are provided at the CAPT and F/O stations.

(9) Pedestal lighting:
Located in the middle of the overhead panel, a flood light illumination of the center pedestal.

DESCRIPTION

Ident.: DSC-33-10-20-00000677.0003001 / 06 JAN 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

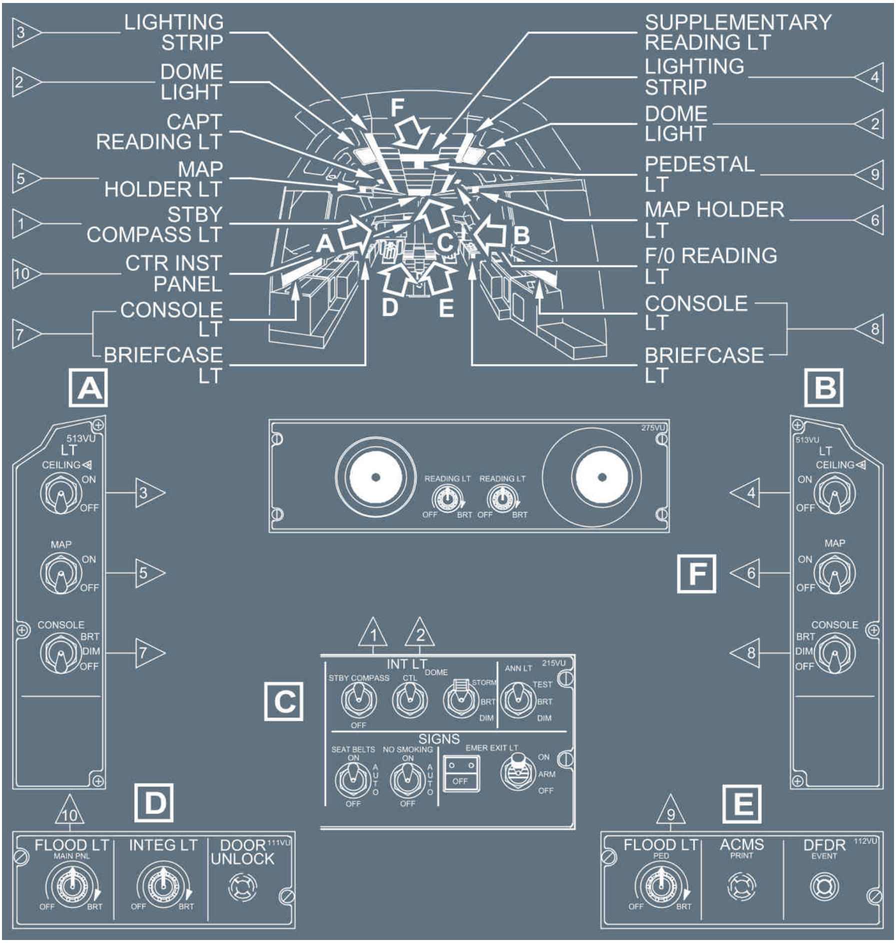
INSTRUMENT AND PANEL INTEGRATED LIGHTING

All instruments and panels installed in the cockpit (other than the DU) are integrally lit.
Their brightness of all instruments and panels can be adjusted.

ANNUNCIATOR LIGHT TEST AND DIMMING

The brightness of all the annunciator lights in the flight deck can be adjusted, depending on the ANN LT TEST / BRT / DIM sw position on the overhead panel.
The lights are dimmed to a fixed level.
An annunciator light test is provided to verify cockpit annunciator lamp operation.
The test is done by selecting the TEST position on the ANN LT «TEST / BRT / DIM» sw, and by visually checking that all lights illuminate.

COCKPIT LIGHTING


LIGHTING STRIP
DOME LIGHT
CAPT READING LT
MAP HOLDER LT
STBY COMPASS LT
CTR INST PANEL
CONSOLE LT
BRIEFCASE LT
SUPPLEMENTARY READING LT
LIGHTING STRIP
DOME LIGHT
PEDESTAL LT
MAP HOLDER LT
F/0 READING LT
CONSOLE LT
BRIEFCASE LT
A B C D E F
1 2 3 4 5 6 7 8 9 10
513VU
LT
CEILING
ON
OFF
MAP
CONSOLE
BRT
DIM
275VU
READING LT
READING LT
OFF
BRT
INT LT
STBY COMPASS
CTL
DOME
STORM
BRT
DIM
ANN LT
TEST
215VU
SIGNS
SEAT BELTS
NO SMOKING
AUTO
EMER EXIT LT
ARM
FLOOD LT
MAIN PNL
INTEG LT
DOOR UNLOCK
111VU
PED
ACMS
PRINT
DFDR
EVENT
112VU

(2, 3, 4) Dome lights and lighting strips:
Two dome lights and lighting strips supply general cockpit illumination providing shadow free lighting.

(5, 6) Map holder lighting:
Map chart holder is provided at the CAPT and F/O stations.

(7, 8) Console and floor lighting:
Briefcase stowage, side console, and floor lighting are provided at the CAPT and F/O stations.

(1, 10) Centre instrument panel and standby compass:
The centre instrument panel is lighted by a set of lights located below the glareshield. The standby compass is provided with integral illumination.

(F) Reading lights:
Individual reading lights, and supplementary reading lights, are provided at the CAPT and F/O stations.

(9) Pedestal lighting:
Located in the middle of the overhead panel, a flood light provides illumination of the centre pedestal.

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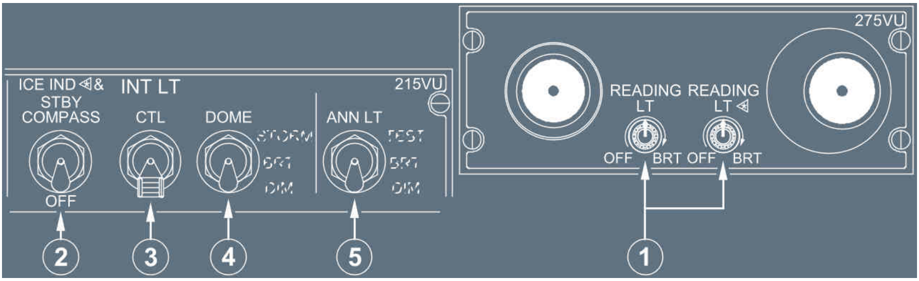
OVERHEAD PANEL

Ident.: DSC-33-10-30-00018009.0001001 / 21 MAR 16
Applicable to: ALL


ICE IND ◁✳ & STBY COMPASS
INT LT
CTL
DOME
STORM
BRT
DIM
215VU
ANN LT
TEST
BRT
DIM
OFF
275VU
READING LT
READING LT ◁✳
OFF
BRT
OFF
BRT
2
3
4
5
1

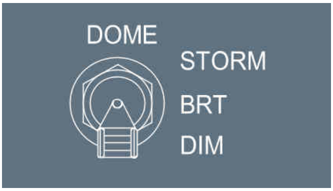
(1) READING LT knob
Turns the reading lights on and off, and adjusts their brightness.
There are two reading lights on the central part of the overhead panel.

(2) ICE IND ◁✳ & STBY COMPASS sw
This switch turns the standby compass light, the seat alignment indicator, and the external ice detector light ◁✳ on and off.

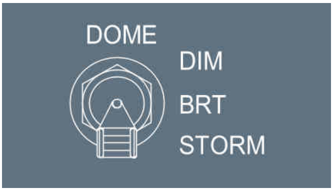
(3) CTL sw
A two-way switch that operates the dome lights. There is another two-way switch on the left rear panel (next to the cockpit door).

Note: *On ground, and when batteries are the only source of power, the dome light on the right automatically comes on, regardless of the switch position selected by the flight crew.*

(4) DOME sw
The DOME sw controls both dome lights. The DOME sw can have one of the two following configurations:


DOME
STORM
BRT
DIM

or


DOME
DIM
BRT
STORM

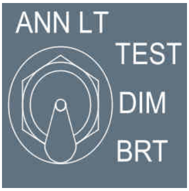
STORM : Sets the two dome lights, and the main instrument panel lights, to their maximum brightness.

BRT : Both dome lights are on and bright. (Provided that the flight crew uses the CTL sw, or the dome light switch on the rear left panel, to turn them on).

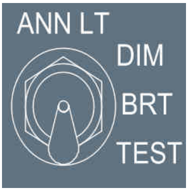
DIM : Both dome lights are on and dim. (Provided that the flight crew uses the CTL sw, or the dome lighting switch on the rear left panel, to turn them on).

(5) ANN LT sw

The ANN LT sw controls all the flight deck annunciator lights. The ANN LT sw can have one of the two following configurations:


ANN LT
TEST
DIM
BRT

or


ANN LT
DIM
BRT
TEST

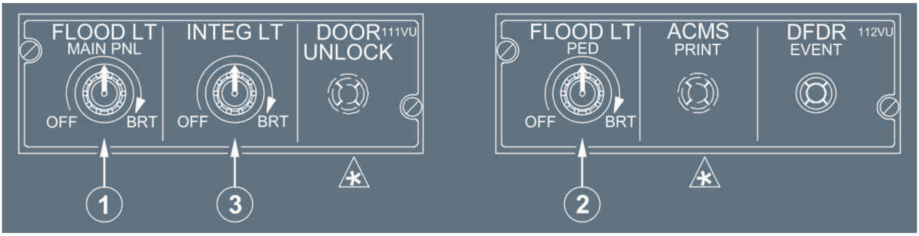
TEST : All flight deck annunciator lights turn on.The figure '8' is displayed on all Liquid Crystal Displays (LCD) of the FCU.

DIM : Reduces the brightness of all flight deck annunciator lights.

BRT : All flight deck annunciator lights operate normally.

PEDESTAL

Ident.: DSC-33-10-30-00018023.0001001 / 21 MAR 16
Applicable to: ALL


FLOOD LT
MAIN PNL
OFF
BRT
INTEG LT
OFF
BRT
DOOR
111VU
UNLOCK
FLOOD LT
PED
OFF
BRT
ACMS
PRINT
DFDR
112VU
EVENT
1
3
2

(1) FLOOD LT MAIN PNL knob

Turns on or off, and adjusts the brightness of the center instrument panel.

(2) FLOOD LT PED knob

Turns on or off, and adjusts the brightness of the pedestal lights.

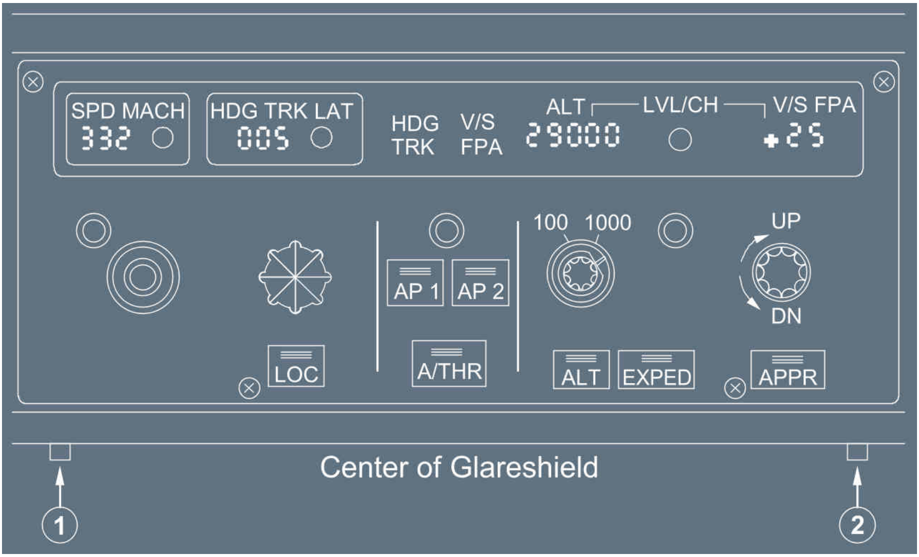
(3) INTEG LT knob

Turns on or off, and adjusts the brightness of the integral lights of:

- The main instrument panel
- The center pedestal
- The overhead panel.

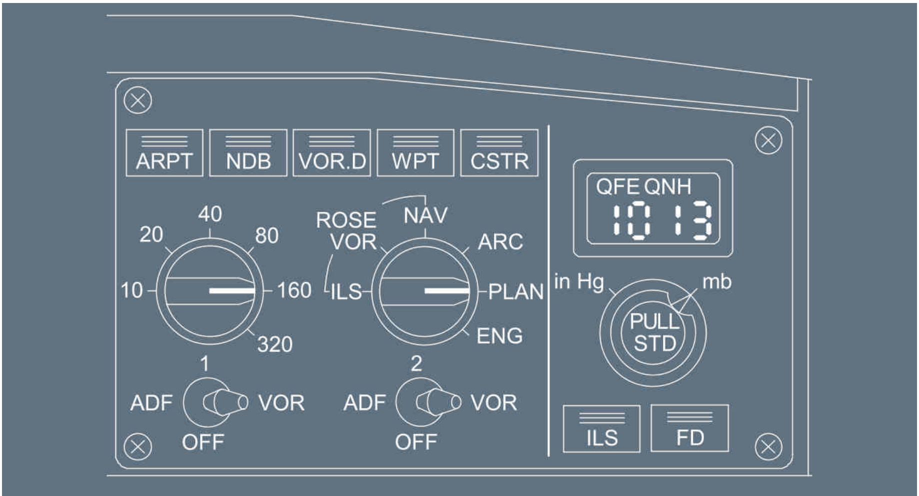
GLARESHIELD

Ident.: DSC-33-10-30-00018034.0001001 / 21 MAR 16
Applicable to: ALL


SPD MACH
332
HDG TRK LAT
005
HDG
TRK
V/S
FPA
ALT
LVL/CH
V/S FPA
29000
+25
100
1000
UP
DN
AP 1
AP 2
LOC
A/THR
ALT
EXPED
APPR
Center of Glareshield
1
2

(1) This knob adjusts the brightness of the integral lighting on the glareshield and of the FCU displays.

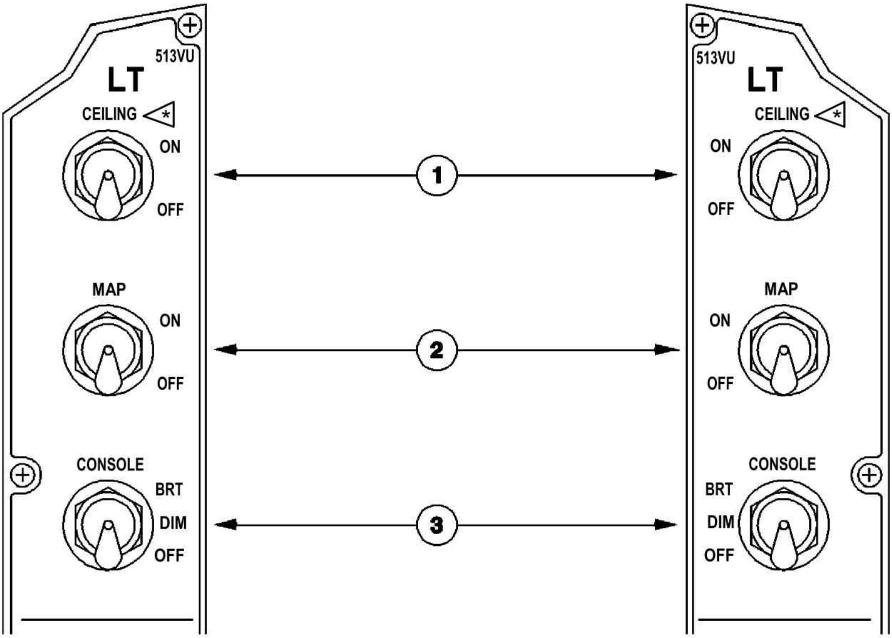
(2) This knob adjusts the brightness of the FCU displays.


ARPT
NDB
VOR.D
WPT
CSTR
QFE QNH
1013
10
20
40
80
160
320
ROSE
VOR
NAV
ARC
ILS
PLAN
ENG
in Hg
mb
PULL
STD
1
ADF
VOR
OFF
2
ADF
VOR
OFF
ILS
FD

Right side of Glareshield

MAIN INSTRUMENT PANEL

Ident.: DSC-33-10-30-00018035.0001001 / 21 MAR 16
Applicable to: ALL


513VU
LT
CEILING
ON
OFF
MAP
ON
OFF
CONSOLE
BRT
DIM
OFF
1
2
3
513VU
LT
CEILING
ON
OFF
MAP
ON
OFF
CONSOLE
BRT
DIM
OFF

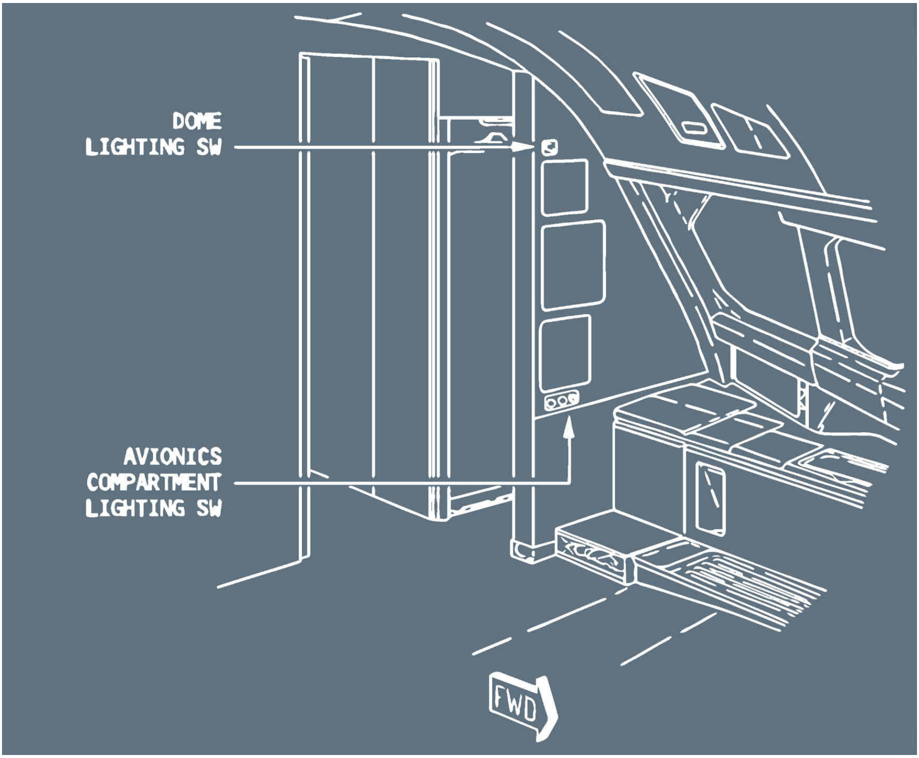
(1) Ceiling sw ◁
Operation of the two lighting strips located on either side of the overhead panel

(2) MAP sw
Operates the two map holder lights located under the side windows.

(3) CONSOLE sw
Illuminates the side consoles, briefcases, and floor surrounding the pilots' seats (two lighting levels).

LEFT REAR PANEL

Ident.: DSC-33-10-30-00018036.0001001 / 21 MAR 16
Applicable to: ALL


DOME
LIGHTING SW
AVIONICS
COMPARTMENT
LIGHTING SW
FWD

GENERAL

Ident.: DSC-33-20-10-00018039.0001001 / 21 MAR 16
Applicable to: ALL

Exterior lighting includes the following lights:
- The navigation lights
- The landing lights
- The runway turn off lights
- The TO and TAXI lights
- The logo lights
- The anticollision lights
- The wing and engine scan lights.

Exterior lighting is controlled by means of switches located on the overhead panel.

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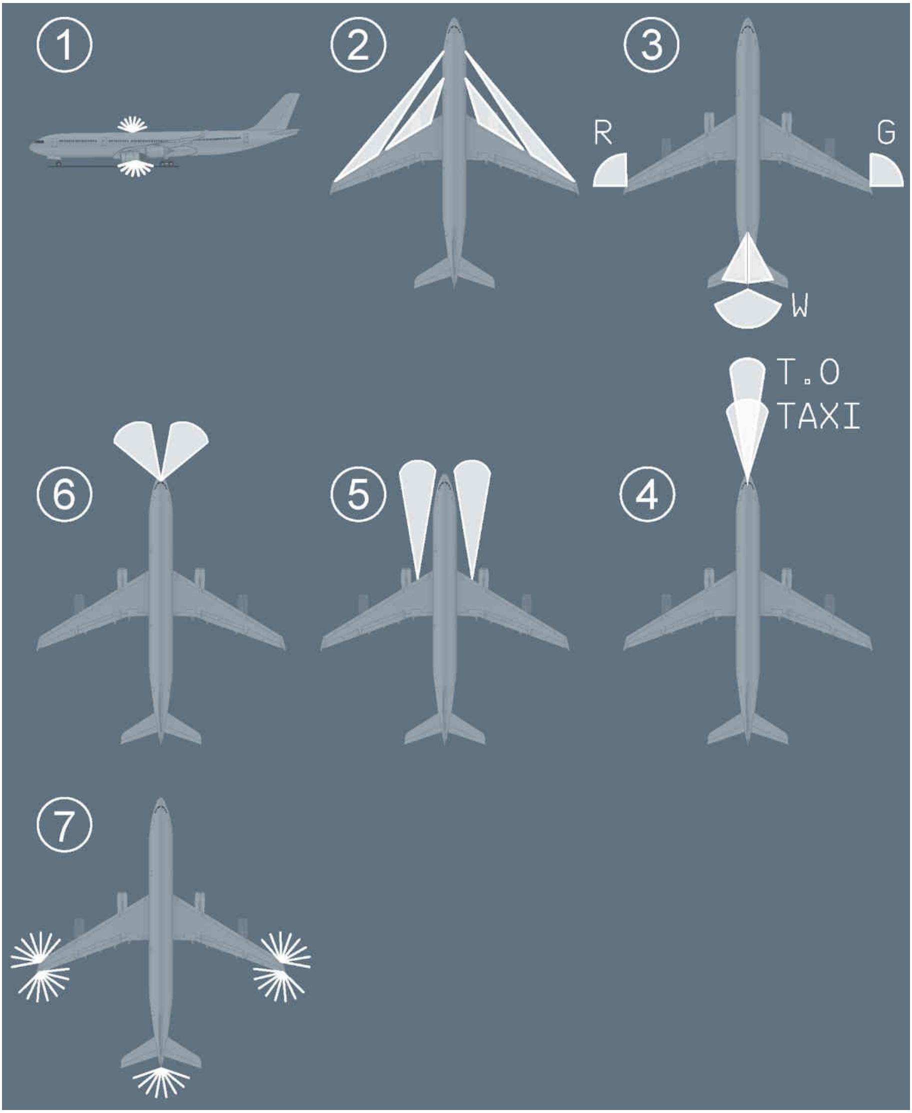
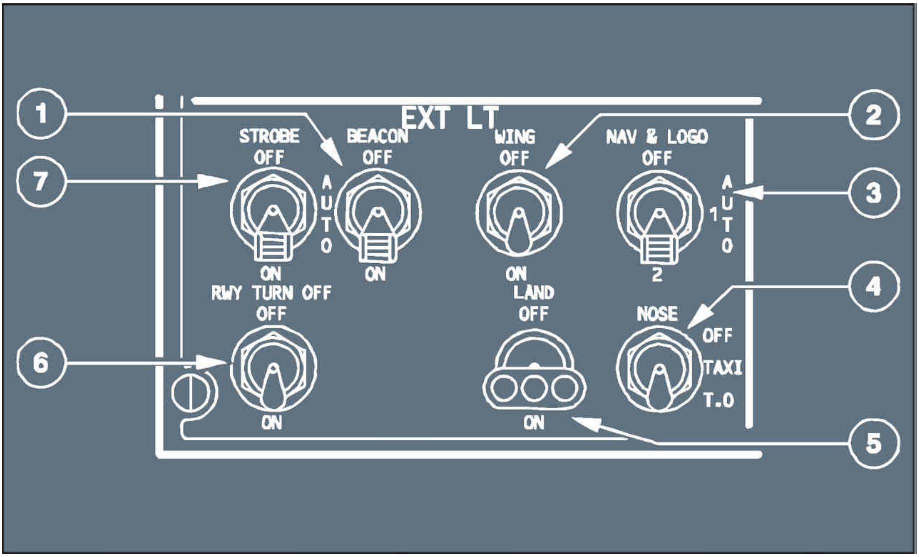
CONTROLS AND INDICATORS

Ident.: DSC-33-20-20-00018042.0001001 / 21 MAR 16


①
②
③
R
G
W
T.O
TAXI
⑥
⑤
④
⑦

OVERHEAD PANEL

Ident.: DSC-33-20-20-00018087.0013001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP


1
7
6
2
3
4
5
EXT LT
STROBE
OFF
AUTO
ON
BEACON
OFF
ON
WING
OFF
ON
NAV & LOGO
OFF
1
AUTO
2
RWY TURN OFF
OFF
ON
LAND
OFF
ON
NOSE
OFF
TAXI
T.O

(1) BEACON sw
This switch turns on and off the two flashing red lights, one on top and one on the bottom of the fuselage.

(2) WING sw
This switch turns on and off two beam lights on each side of the fuselage. These lights provide lighting on the wing leading edge and on the engine air intake to detect ice accretion. The wing and engine scan lights go off when the door 2 (LH or RH) opens for aircraft equipped with an automatic control logic of the wing and engine scan lights ◁✳ .

(3) NAV & LOGO sw
There are navigation lights on each wing tip and in the APU tail cone.
There are logo lights on in the upper surface of each horizontal stabilizer. These lights provide lighting for the company logo on the vertical stabilizer.

2 : Turns on NAV 2 and the LOGO lights.

AUTO 1 : Turns on NAV 1.
Turns on the LOGO lights when the main landing gear is compressed or, depending on the aircraft configuration, when flaps are extended (at least 15 ° on some aircraft).

OFF : The NAV and the LOGO lights are off.

(4) NOSE sw

This switch turns the taxi and takeoff lights on and off.

T.O : Turns on both taxi and takeoff lights.

TAXI : Turns on only taxi light.

OFF : Taxi and takeoff lights are off.

Note: *These two lights, attached to the nose gear strut, go off automatically when the landing gear is retracted.*

(5) LAND sw

This switch turns on and off the landing lights.

(6) RWY TURN OFF sw

This switch turns the runway turn-off lights on and off.

Note: *These lights go off automatically when the landing gear is retracted.*

(7) STROBE sw

This switch turns on and off the three synchronized strobe lights, one on each wing and one below the tail cone.

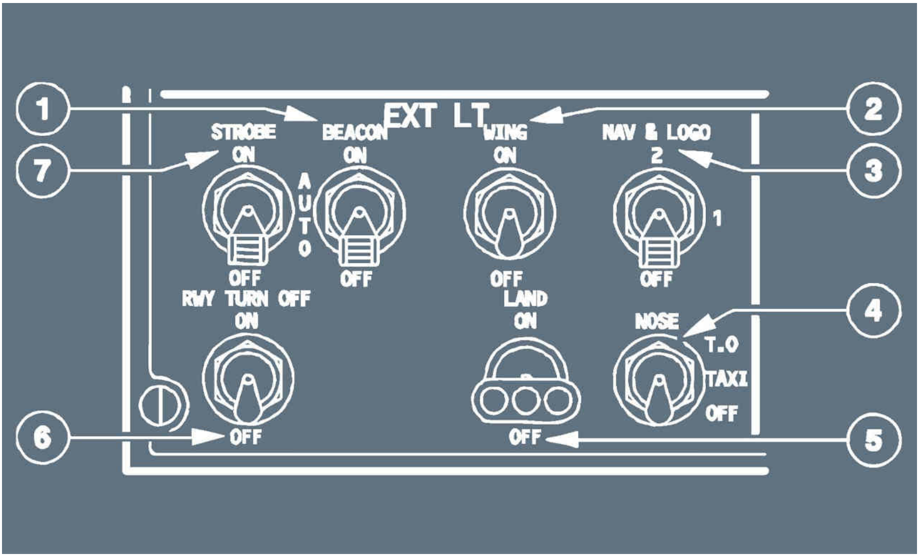
ON : The strobe lights flash white.

AUTO : The strobe lights come on automatically when the main landing gear is not compressed.

OFF : The strobe lights are off.

OVERHEAD PANEL

Ident.: DSC-33-20-20-00018087.0020001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



(1) BEACON sw
This switch turns on and off the two flashing red lights, one on top and one on the bottom of the fuselage.

(2) WING sw
This switch turns on and off two beam lights on each side of the fuselage. These lights provide lighting on the wing leading edge and on the engine air intake to detect ice accretion.
The wing and engine scan lights go off when the door 2 (LH or RH) opens for aircraft equipped with an automatic control logic of the wing and engine scan lights .

(3) NAV & LOGO sw
There are navigation lights on each wing tip and in the APU tail cone.
There are logo lights on the upper surface of each horizontal stabilizer.
These lights provide lighting for the company logo on the vertical stabilizer provided the main landing gears is compressed, or depending on the aircraft configuration, when flaps are extended (at least 15 ° on some aircraft).

2 : Turns on NAV 2 and the LOGO lights.
1 : Turns on NAV 1 and the LOGO lights.

OFF : The NAV and the LOGO lights are off.

(4) NOSE sw

This switch turns the taxi and takeoff lights on and off.

T.O : Turns on both taxi and takeoff lights.

TAXI : Turns on only taxi light.

OFF : Taxi and takeoff lights are off.

Note: These two lights, attached to the nose gear strut, go off automatically when the landing gear is retracted.

(5) LAND sw

This switch turns on and off the landing lights.

(6) RWY TURN OFF sw

This switch turns the runway turn-off lights on and off.

Note: These lights go off automatically when the landing gear is retracted.

(7) STROBE sw

Operation of the two synchronized strobe lights on each wing tip plus one in the tail cone.

ON : The strobe lights flash white.

AUTO : The strobe lights come on automatically when the main landing gear is not compressed.

OFF : The strobe lights are off.

MEMO DISPLAY

Ident.: DSC-33-20-20-00000718.0001001 / 22 MAR 16

Applicable to: ALL

STROBE LT OFF : The message is displayed in green, if the STROBE sw is OFF in flight.

GENERAL

Ident.: DSC-33-30-10-00017993.0001001 / 21 MAR 16
Applicable to: ALL

Emergency lighting consists of the following:
- Cabin emergency lighting:
  - Proximity emergency escape path marking system (escape path and exit markers),
  - Overhead emergency lights, and
  - EXIT signs.
- Escape slide lighting.

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OPERATION

Ident.: DSC-33-30-20-00017959.0001001 / 21 MAR 16
Applicable to: LV-KAN, LV-KAO

- The proximity emergency escape path marking, overhead emergency lighting, and EXIT signs come on, if the EMER EXIT LT sw is at ON, or if the EMER pb on the Purser's panel is pressed.
- The cabin emergency lighting system is supplied as follows:
  - The DC ESS BUS and AC BUS 1 supply the cabin emergency lighting.
  - If the DC ESS BUS fails, internal batteries provide power to the cabin emergency lighting.
  - In nominal case, the DC ESS BUS charges these internal batteries.
- The escape slides are equipped with an integral lighting system. The escape slide lights come on automatically, when the slide is armed and the door is open. They have the same supply as the cabin emergency lighting.

OPERATION

Ident.: DSC-33-30-20-00017959.0010001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

- The floor proximity emergency escape path marking is a self-luminescent system.
- The exit markers of the proximity emergency escape path marking, the overhead emergency lighting, and the EXIT signs come on, if the EMER EXIT LT sw is ON, or if the Purser panel's EMER pb is pressed.
- The cabin emergency lighting system is supplied as follows:
  - The DC ESS BUS and AC BUS 1 supply the cabin emergency lighting.
  - If the DC ESS BUS fails, internal batteries provide power to the cabin emergency lighting.
  - In nominal case, the DC ESS BUS charges these internal batteries.
- The escape slides are equipped with an integral lighting system. The escape slide lights come on automatically, when the slide is armed and the door is open. They have the same supply as the cabin emergency lighting.

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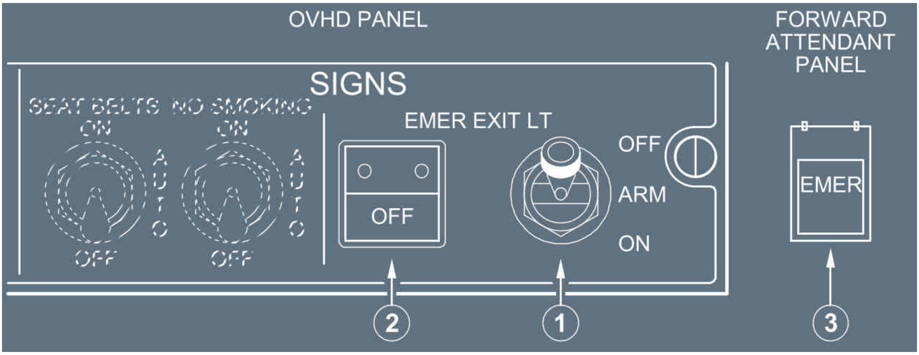
OVERHEAD PANEL

Ident.: DSC-33-30-30-00017958.0003001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP


OVHD PANEL
FORWARD ATTENDANT PANEL
SIGNS
SEAT BELTS
NO SMOKING
ON
AUTO
OFF
EMER EXIT LT
OFF
ARM
ON
EMER
2
1
3

(1) EMER EXIT LT sw

ON : The cabin emergency lighting comes on.

OFF : The cabin emergency lighting is off.

ARM :
- The cabin emergency lighting automatically comes on if:
  - DC ESS BUS fails, or
  - Normal aircraft electrical power fails
- The overhead emergency lights automatically come on in the case of partial loss of the normal AC power supply. This is provide minimum cabin lighting.

(2) EMER EXIT LT OFF light

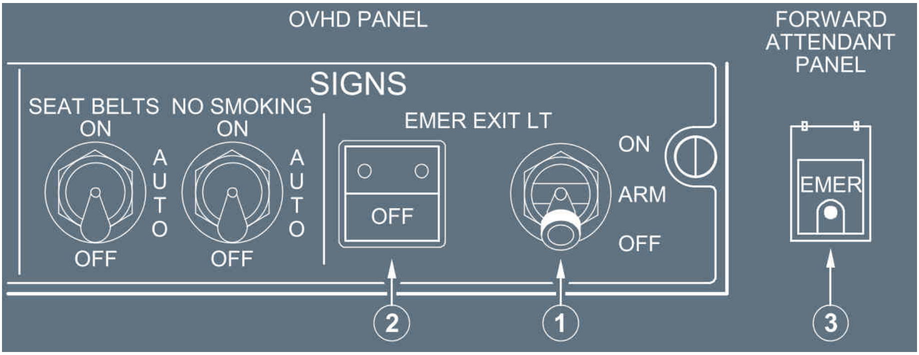
Comes on amber when the EMER EXIT LT sw is set to OFF.

(3) EMER pb sw

On : Emergency lights, EXIT signs and proximity emergency escape path marking come on.

OVERHEAD PANEL

Ident.: DSC-33-30-30-00017958.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


OVHD PANEL
FORWARD ATTENDANT PANEL
SIGNS
SEAT BELTS
NO SMOKING
ON
ON
AUTO
AUTO
OFF
OFF
EMER EXIT LT
OFF
ON
ARM
OFF
EMER
2
1
3

(1) EMER EXIT LT sw

ON : The cabin emergency lighting comes on.

OFF : The cabin emergency lighting is off.

ARM :
- The cabin emergency lighting automatically comes on if:
  - DC ESS BUS fails, or
  - Normal aircraft electrical power fails
- The overhead emergency lights automatically come on in the case of partial loss of the normal AC power supply. This is to provide minimum cabin lighting.

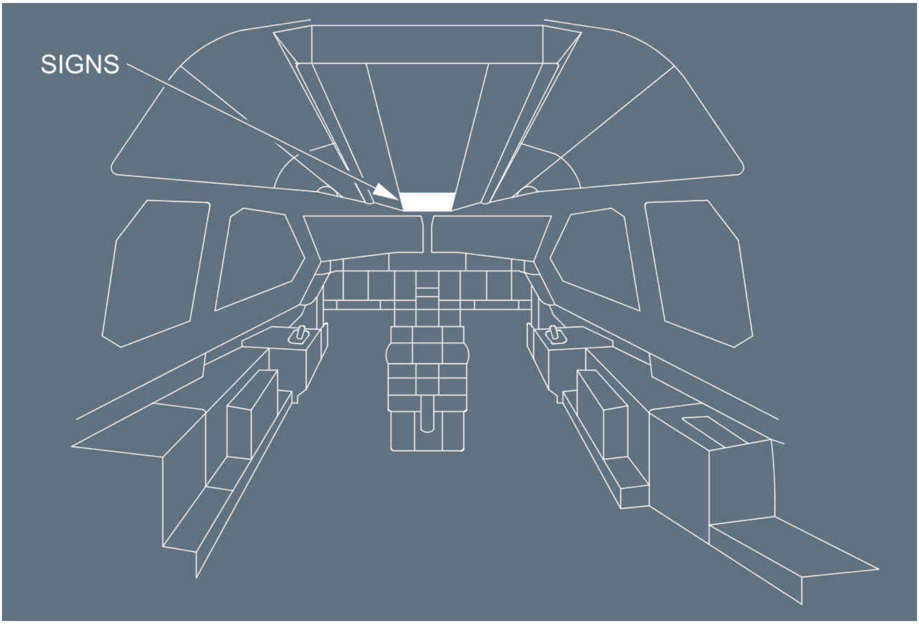
(2) EMER EXIT LT OFF light
Comes on amber when the EMER EXIT LT sw is set to OFF.

(3) EMER pb-sw

On : Emergency lights, EXIT signs and proximity emergency escape path marking come on.

OVERHEAD PANEL

Ident.: DSC-33-40-10-00017948.0001001 / 21 MAR 16
Applicable to: ALL



The switches described below are installed on the SIGNS panel on the overhead panel.

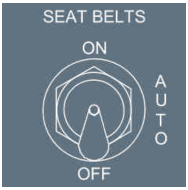
The cabin signs consist of the following:
- a SEAT BELTS sw, and
- a NO SMOKING sw ◁ , or
- an EXIT sw ◁ , or
- a NO PORTABLE ELEC DEVICE sw ◁ .

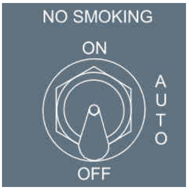
The SEAT BELTS sw activates the FASTEN SEAT BELT and RETURN TO YOUR SEAT signs.
The NO SMOKING sw ◁ activates the EXIT and NO SMOKING signs.
The NO PORTABLE ELEC DEVICE sw ◁ activates the EXIT and NO MOBILE signs.
A low tone chime sounds (depending on CIDS/CAM Programming) each time a sign goes on or off.
Each switch has 3 positions:

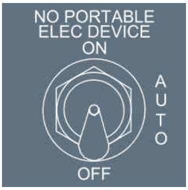
ON	:	Signs are on in the cabin
AUTO ◁	:	Signs are on in the cabin when either landing gear is extended or flaps/slats are extended (position 1, 2, 3 or FULL)

OFF : Signs are off in the cabin

Example of switches layout:



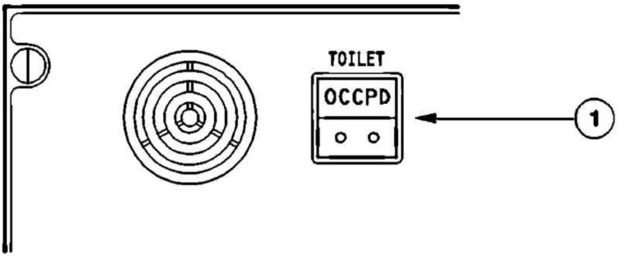




Note: *In the event of excessive cabin altitude, the cabin lights (depending on CIDS/CAM programming) and all the cabin signs, except the NO PORTABLE ELEC DEVICE signs ◁, come on regardless of switches position.*

OVERHEAD PANEL (CONT'D)

Ident.: DSC-33-40-10-00017931.0001001 / 21 MAR 16
Applicable to: ALL



(1) TOILET OCCPD light
The OCCPD light comes on when the lavatory located near the forward exit is occupied.

MEMO DISPLAY

Ident.: DSC-33-40-10-00015508.0001001 / 05 JAN 15
Applicable to: ALL

When the corresponding signs are on, the ECAM displays in green the SEAT BELTS message, the NO SMOKING message or the NO PORTABLE DEVICES message, depending on aircraft customization.

AIRCRAFT SYSTEMS

NAVIGATION

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DSC-34-10-10 ADIRS

DSC-34-10-10-10 Description

General....A
Probes Location....B
Probes Schematic....C
ADIRS Schematic....D

DSC-34-10-10-20 Controls and Indicators

Overhead Panel....A
Pedestal....B
Main Instruments Panel....C
Memo Display....D
Maximum Differences Between Speed/Mach Indications....E

DSC-34-10-10-30 Abnormal Operations

DSC-34-10-10-30-10 Backup Speed/Altitude Scale

Backup Speed/Altitude Scale - General....A
Backup Speed/Altitude Scale - Backup Speed Scale....B

DSC-34-10-15 GPS

DSC-34-10-15-10 Description

Description....A

DSC-34-10-20 Standby Instruments

Compass....A
Description of the ISIS....B
Attitude....C
Airspeed....D
Altimeter....E
Landing System Function....F
BUGS Function....G
Flags....H

DSC-34-10-30 Radio NAV

DSC-34-10-30-10 Tuning

General....A
Architecture....B

Continued on the following page

Continued from the previous page

DSC-34-10-30-20 Navaids

VOR....................A
ILS / GLS....................B
ADF....................C
DME....................D
Marker Beacon....................E

DSC-34-10-30-30 Controls and Indicators

Digital Distance and Radio Magnetic Indicator (DDRMI)....................A
Radio Management Panel (RMP)....................B

DSC-34-10-40 Radio Altimeter

DSC-34-10-40-10 Description

General....................A
Automatic Callout....................B

GENERAL

Ident.: DSC-34-10-10-10-00018959.0001001 / 21 MAR 16
Applicable to: ALL

The Air Data and Inertial Reference System (ADIRS) supplies temperature, anemometric, barometric and inertial parameters to the EFIS system (PFD and ND) and to other user systems (FMGEC, FADEC, PRIM, SEC, FWC, SFCC, ATC, GPWS, CMC, CPC).

The system includes:

- Three identical ADIRUs (Air Data and Inertial Reference Units).

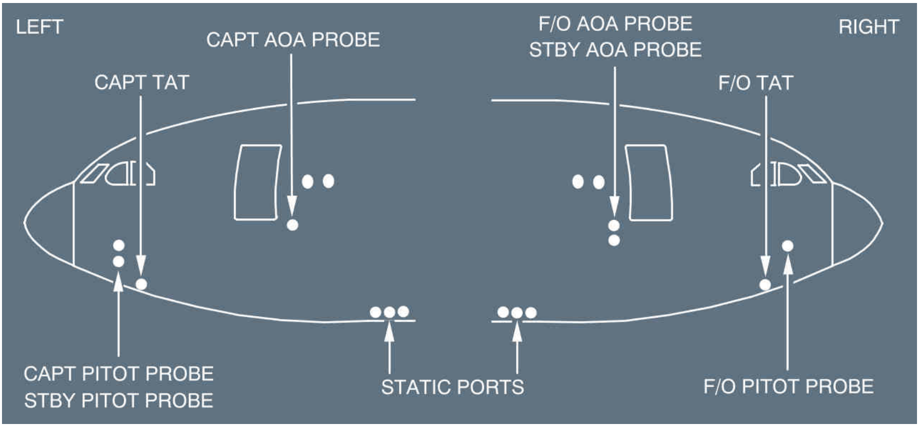
  Each ADIRU is divided in two parts, either of which can work separately in case of failure in the other:
  - The ADR (Air Data Reference) part which supplies barometric altitude, airspeed, Mach, angle of attack, temperature and overspeed warnings.
  - The IR (Inertial Reference) part which supplies attitude, flight path vector, track, heading, accelerations, angular rates, ground speed, vertical speed and aircraft position.
- One ADIRS control panel on the overhead panel for selection of modes (NAV, ATT, OFF) and indications of failures.
- Four types of sensors:
  - Pitot probes (3)
  - Static pressure probes (STAT) (6)
  - Angle of attack sensors (AOA) (3)
  - Total air temperature probes (TAT) (2)

  These sensors are electrically heated to prevent from icing up.
- Eight ADMs (Air Data Modules) which convert pneumatic data from PITOT and STAT probes into numerical data for the ADIRUs.
- A switching facility for selecting ADR3 or IR3 for instrument displays in case of ADIRU1 or 2 failure.
- A MAG/TRUE pb-sw for polar navigation.

PROBES LOCATION

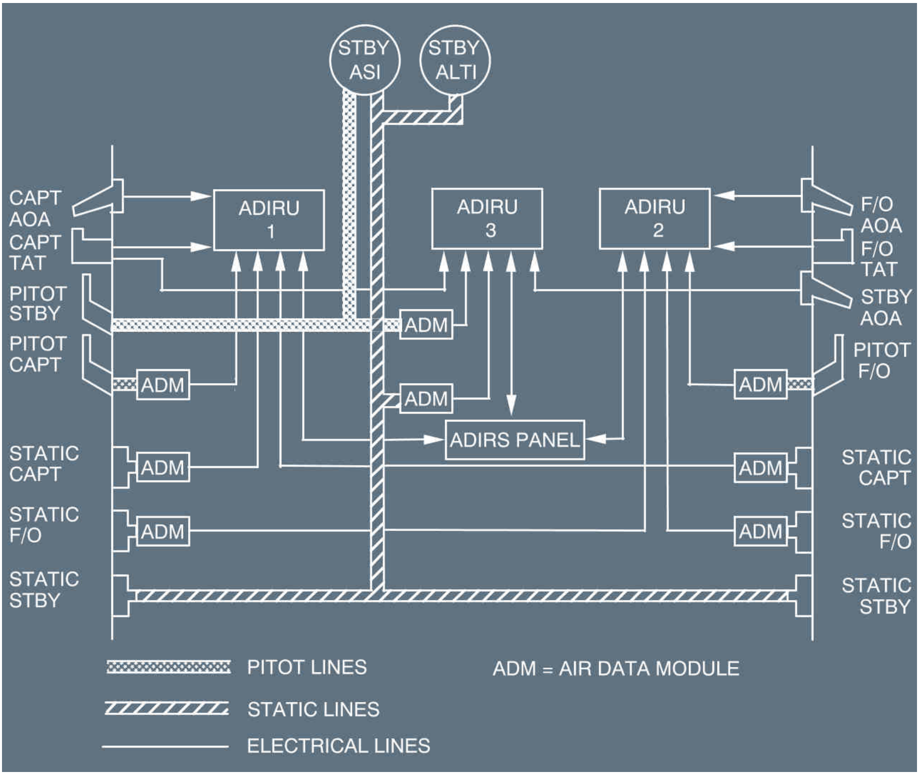
Ident.: DSC-34-10-10-10-00001019.0001001 / 22 MAR 16

Applicable to: ALL


LEFT
CAPT AOA PROBE
F/O AOA PROBE
STBY AOA PROBE
RIGHT
CAPT TAT
F/O TAT
CAPT PITOT PROBE
STBY PITOT PROBE
STATIC PORTS
F/O PITOT PROBE

PROBES SCHEMATIC

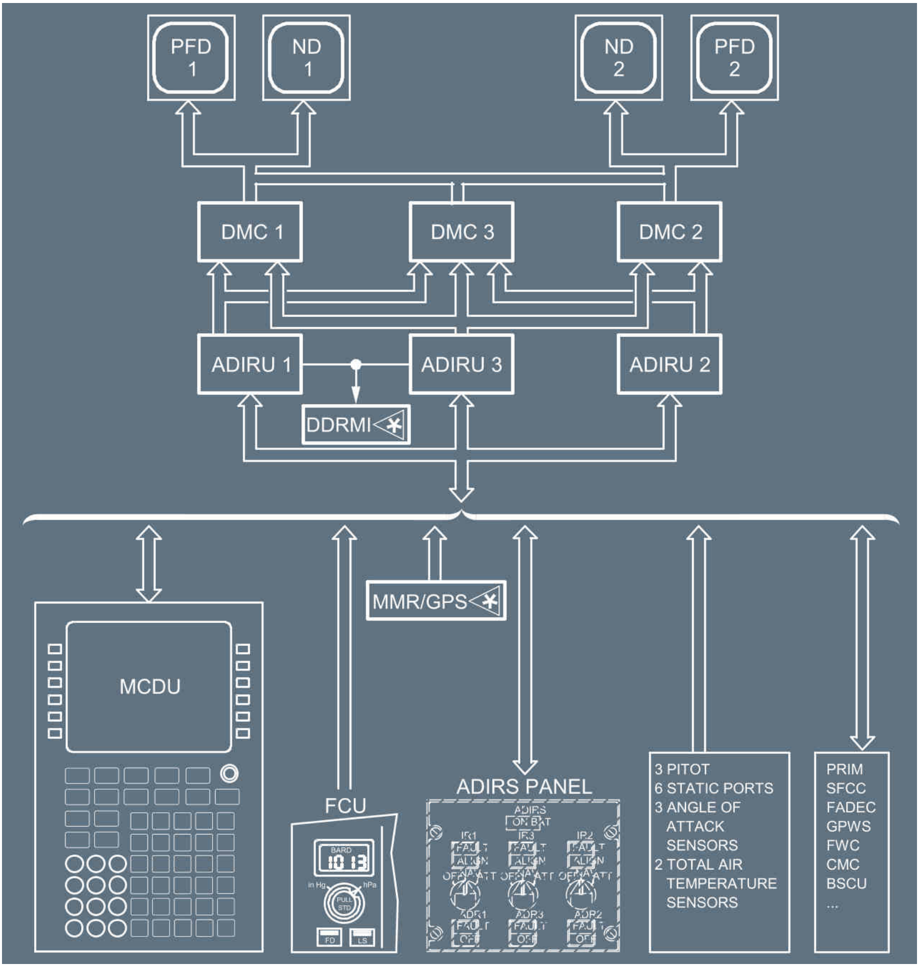
Ident.: DSC-34-10-10-10-00001021.0001001 / 22 MAR 16
Applicable to: ALL


STBY ASI
STBY ALTI
CAPT AOA
CAPT TAT
PITOT STBY
PITOT CAPT
STATIC CAPT
STATIC F/O
STATIC STBY
ADIRU 1
ADIRU 3
ADIRU 2
ADM
ADIRS PANEL
F/O AOA
F/O TAT
STBY AOA
PITOT F/O
STATIC CAPT
STATIC F/O
STATIC STBY
PITOT LINES
STATIC LINES
ELECTRICAL LINES
ADM = AIR DATA MODULE

Note: *ADIRU 1 is supplied by CAPT probes,*
ADIRU 2 is supplied by F/O probes,
ADIRU 3 is supplied by STBY probes and CAPT TAT

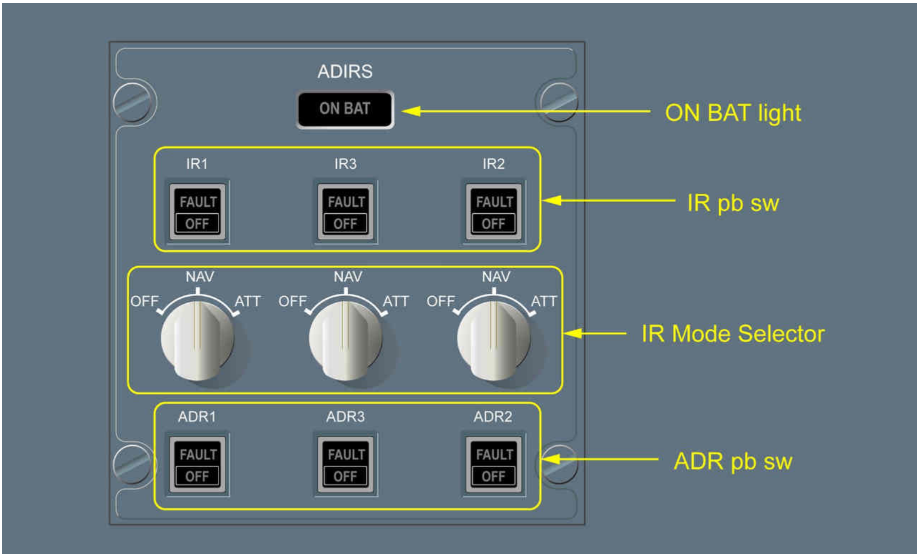
ADIRS SCHEMATIC

Ident.: DSC-34-10-10-10-00018960.0001001 / 21 MAR 16
Applicable to: ALL

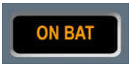

PFD
1
ND
1
ND
2
PFD
2
DMC 1
DMC 3
DMC 2
ADIRU 1
ADIRU 3
ADIRU 2
DDRMI
MMR/GPS
MCDU
FCU
BARO
in Hg
hPa
PULL STD
FD
LS
ADIRS PANEL
ADIRS
ON BAT
IR1
IR3
IR2
FAULT
ALIGN
OFF NAV ATT
ADR1
ADR3
ADR2
FAULT
OFF
3 PITOT
6 STATIC PORTS
3 ANGLE OF ATTACK SENSORS
2 TOTAL AIR TEMPERATURE SENSORS
PRIM
SFCC
FADEC
GPWS
FWC
CMC
BSCU
...

OVERHEAD PANEL

Ident.: DSC-34-10-10-20-00018961.0001001 / 03 NOV 23
Applicable to: ALL

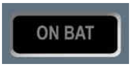

ADIRS
ON BAT
ON BAT light
IR1
IR3
IR2
FAULT
OFF
IR pb sw
NAV
OFF
ATT
IR Mode Selector
ADR1
ADR3
ADR2
FAULT
OFF
ADR pb sw

ON BAT LIGHT



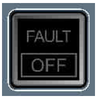
Batteries supply at least one ADIRU. The ON BAT light also comes on for a few seconds at the beginning of a complete IRS alignment.
The ON BAT light does not come on in the case of a fast alignment.

Note: *When the aircraft is on ground and if at least one ADIRU is supplied by aircraft batteries:*
- *An external horn sounds*
- *The ADIRU light comes on amber on the SERVICE INTERPHONE BAY panel.*

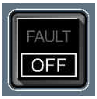


One of the following applies:
- All three ADIRUs are on, and not supplied by batteries, or
- All three ADIRUs are off.

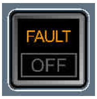
IR 1(2)(3) pb-sw



IR 1(2)(3) is on.
When pressed, turns off the IR 1(2)(3).

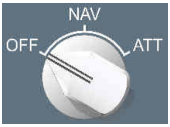


IR 1(2)(3) is off.
When pressed, turns on the IR 1(2)(3).

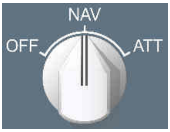


IR 1(2)(3) is failed.
Associated with the NAV IR 1(2)(3) FAULT alert (*Refer to procedure*).
When IR 1(2)(3) FAULT light flashes, the attitude and heading information may be recovered in ATT mode.
When IR 1(2)(3) FAULT light is steady, the IR 1(2)(3) is lost.
When pressed, turns off the IR 1(2)(3). The FAULT light goes off.

IR 1(2)(3) Mode selector

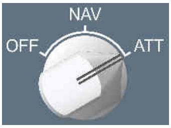


ADIRU 1(2)(3) is not energized.
Both the IR 1(2)(3) data and the ADR 1(2)(3) data are not available.



IR 1(2)(3) operates in NAV mode.
IR 1(2)(3) provides full inertial data to the aircraft systems.

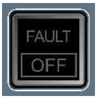
Note: *ADR 1(2)(3) provides full air data to the aircraft systems.*



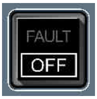
IR 1(2)(3) operates in ATT mode.
IR 1(2)(3) only provides attitude and heading data (if entered by the flight crew). The navigation data are not available.
The heading must be entered through the MCDU and has to be reset frequently (about every 10 min).

Note: *During the flight, if the IR mode selector is set from NAV to ATT or NAV to OFF, the NAV mode is lost for the remainder of the flight.*
When in ATT mode, the flight crew can only recover the NAV mode on ground via a complete alignment.

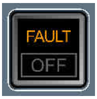
ADR 1(2)(3) pb-sw



ADR 1(2)(3) is on.
When pressed, turns off the ADR 1(2)(3).



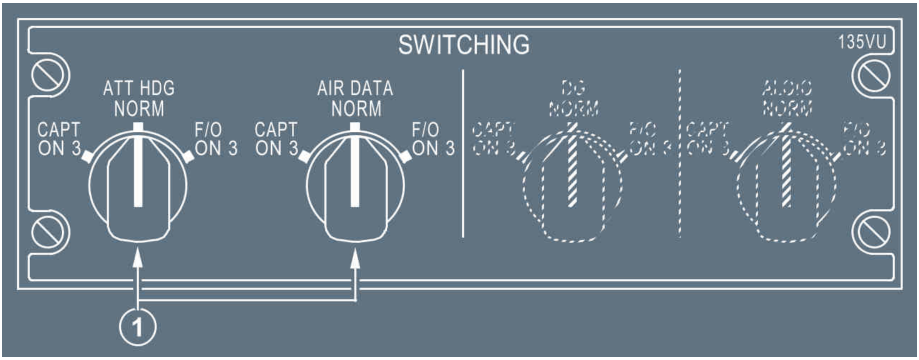
ADR 1(2)(3) is off.
When pressed, turns on the ADR 1(2)(3).



ADR 1(2)(3) is failed.
Associated with the NAV ADR 1(2)(3) FAULT alert (*Refer to procedure*).
When pressed, turns off the ADR 1(2)(3). The FAULT light goes off.

PEDESTAL

Ident.: DSC-34-10-10-20-00018962.0001001 / 20 MAR 17
Applicable to: ALL


SWITCHING
135VU
ATT HDG
NORM
CAPT
ON 3
F/O
ON 3
AIR DATA
NORM
CAPT
ON 3
F/O
ON 3
1

(1) ATT HDG and AIR DATA sel

NORM : ADIRU1 supplies data to PFD1, ND1, DDRMI ◁ and ATC1.
ADIRU2 supplies data to PFD2, ND2 and ATC2.

CAPT ON 3 : ADR3 or IR3 replaces ADR1 or IR1.

F/O ON 3 : ADR3 or IR3 replaces ADR2 or IR2.

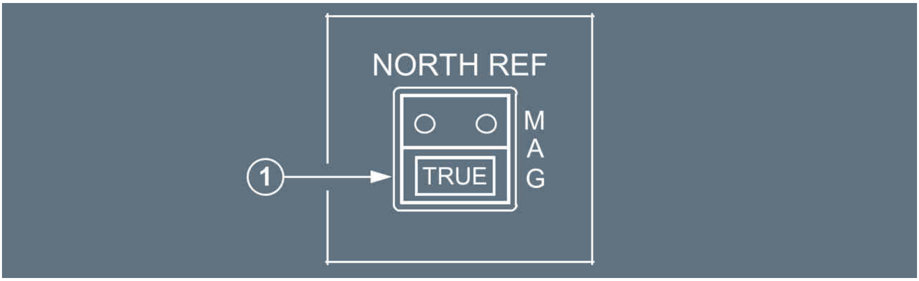
MAIN INSTRUMENTS PANEL

Ident.: DSC-34-10-10-20-00018963.0001001 / 21 MAR 16
Applicable to: ALL

When entering in the following area, the ADIRUs will trigger the message “SELECT TRUE REF” on ND requesting to change north reference:

- North of 73 ° North, between 90 ° West and 120 ° West (magnetic polar region), and
- North of 82 ° North, and
- South of 60 ° South.

When the NORTH REF pb-sw is set to TRUE, the ADIRUs replace magnetic heading by true heading on EFIS and DDRMI ◁ . In addition, the GRID track appears on ND.



(1) NORTH REF pb-sw

TRUE (in) : Pressing this pushbutton-switch selects the true heading for instrument display.
TRUE light comes on blue.

MAG (out) : Magnetic heading is selected.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-34-10-10-20-A-00017200.0001001 / 21 MAR 16

ADIRS SWTG : This memo appears in green when either the AIR DATA or the ATT HDG selector is not in the NORM position.

Ident.: DSC-34-10-10-20-A-00017196.0001001 / 04 JUN 19

IR XXX IN ATT ALIGN : This memo appears during an IR alignment in Attitude mode.

Ident.: DSC-34-10-10-20-A-00017197.0001001 / 21 MAR 16

IRS IN ALIGN : This memo appears in amber if engines are running.

IRS IN ALIGN : This memo flashes in green if IRS alignment is faulty.

Ident.: DSC-34-10-10-20-A-00017195.0001001 / 21 MAR 16

IRS IN ALIGN XXX : This memo appears in green during an IR alignment.

Ident.: DSC-34-10-10-20-A-00017198.0001001 / 21 MAR 16

TRUE NORTH REF : This memo appears in green when the NORTH REF pb-sw is at TRUE. The message pulses for 10 s in flight phase 1 or 2, or at slats' extension.

MAXIMUM DIFFERENCES BETWEEN SPEED/MACH INDICATIONS

Ident.: DSC-34-10-10-20-00020923.0001001 / 10 MAY 21
Applicable to: ALL

The following table details the TSM values used to determine if a maintenance task is due when a difference between Speed/Mach indications is observed.
They are provided in order for flight crews to determine if indeed maintenance actions should be requested.

FL	SPEED	SPEED/MACH COMPARISON BETWEEN					
		ADR1 and ADR2 (on PFD)		ADR3 and ADR1 or ADR3 and ADR2 (on PFD)		Standby Airspeed Indicator and any ADR 1 or 2 or 3	
		kt	Mach	kt	Mach	kt	Mach on ISIS ◁ (1)
GND CHECK	-	6 kt	M 0.008	6 kt	M 0.008	6 kt	-
FL 50	250 kt	4 kt	M 0.010	4 kt	M 0.010	7 kt	-
FL 100	250 kt	4 kt	M 0.009	4 kt	M 0.009	7 kt	M 0.030
FL 200	300 kt	3 kt	M 0.008	3 kt	M 0.009	8 kt	M 0.031
FL 300	M 0.82	3 kt	M 0.009	3 kt	M 0.009	8 kt	M 0.025
FL 410	M 0.82	4 kt	M 0.009	4 kt	M 0.009	7 kt	M 0.023

(1) *Mach values lower than M 0.50 in climb, and M 0.45 in descent, are not displayed on ISIS ◁ .*

Intentionally left blank

Backup Speed/Altitude Scale

BACKUP SPEED/ALTITUDE SCALE - GENERAL

Ident.: DSC-34-10-10-30-10-00000729.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

The BackUp Speed Scale (BUSS) enables to fly the aircraft when airspeed indications are unreliable.

When the BUSS is activated:
- The BUSS replaces the normal speed,
- The GPS altitude replaces the barometric altitude scales.

The BUSS is displayed on both PFDs when the flight crew turn off all ADRs.
The activation of this BUSS is not reversible.
The BUSS information is based on the angle of attack (AOA), and depends on the slat/flap configuration.

BACKUP SPEED/ALTITUDE SCALE - GENERAL

Ident.: DSC-34-10-10-30-10-00000729.0002001 / 21 MAR 16
Applicable to: LV-GHQ, LV-GIF, LV-GKP

GENERAL

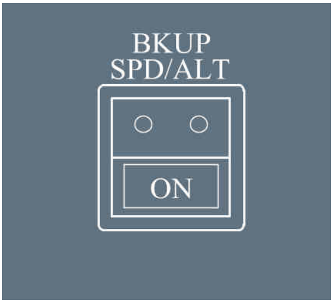
The BackUp Speed Scale (BUSS) enables to fly the aircraft when airspeed indications are unreliable.

When the BUSS is activated:
- The BUSS replaces the normal speed,
- The GPS altitude replaces the barometric altitude scale.

The use of the BUSS is reversible.

The reversible BUSS is activated and deactivated with two BKUP SPD/ALT pb available on the main instrument panel:
- One on the left of the Captain PFD,
- One on the right of the F/O PFD.

Each BKUP SPD/ALT pb independently commands the display of the BUSS on its associated side.



The BUSS information is based on the angle of attack (AOA), and depends on the slat/flap configuration.

ECAM ALERT AND MEMO

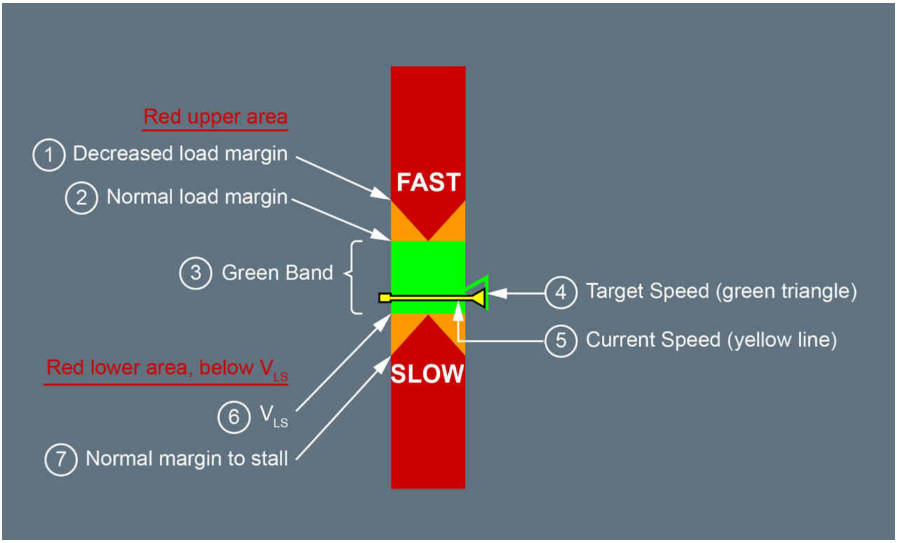
The ECAM displays a memo when the flight crew activates the BKUP SPD/ALT on one side: BKUP SPD/ALT.

The ECAM displays an alert when the flight crew activates the BKUP SPD/ALT:
- On one side with the AP and/or FD engaged on the same side,
  Refer to PRO-ABN-NAV NAV BKUP SPD/ALT ON CAPT(F/O) PFD, or
- On both sides,
  Refer to PRO-ABN-NAV NAV BKUP SPD /ALT ON CAPT+F/O PFD.

BACKUP SPEED/ALTITUDE SCALE - BACKUP SPEED SCALE

Ident.: DSC-34-10-10-30-10-00000730.0001001 / 21 MAR 16
Applicable to: ALL

BACKUP SPEED SCALE


Red upper area
1 Decreased load margin
2 Normal load margin
3 Green Band
Red lower area, below V_{LS}
6 V_{LS}
7 Normal margin to stall
FAST
SLOW
4 Target Speed (green triangle)
5 Current Speed (yellow line)

(1) Red FAST area
This area indicates the excessive speed range while decreasing the margin to the maximum structural speed.

(2) Amber FAST area
This area indicates the excessive speed range while keeping an appropriate margin to the maximum structural speed.

(3) Green area
The green area indicates the safe speed range.

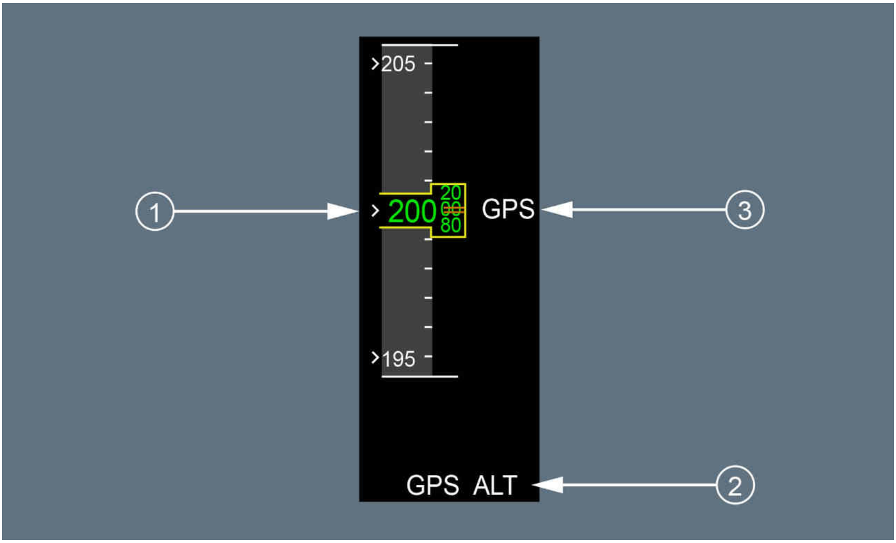
(4) Target speed (green triangle)
This symbol indicates the optimum target speed.
During the approach, it indicates the target speed for the approach.

(5) Actual speed reference (yellow line)
This line indicates the current speed of the aircraft.

(6) Amber SLOW area
This area indicates the too low speed range while keeping an appropriate margin to the stall speed.

(7) Red SLOW area
This area indicates the too low speed range while reducing the margin to the stall speed.

BACKUP ALTITUDE SCALE



(1) Current GPS altitude
Two amber dashes cover the last two digits.

(2) GPS ALT flag
This flag indicates that the barometric altitude is replaced by the GPS altitude.

(3) GPS flag (displayed depending of the aircraft configuration)
This flag indicates that the barometric altitude is replaced by the GPS altitude.

Note: *The vertical speed indication is no longer displayed.*

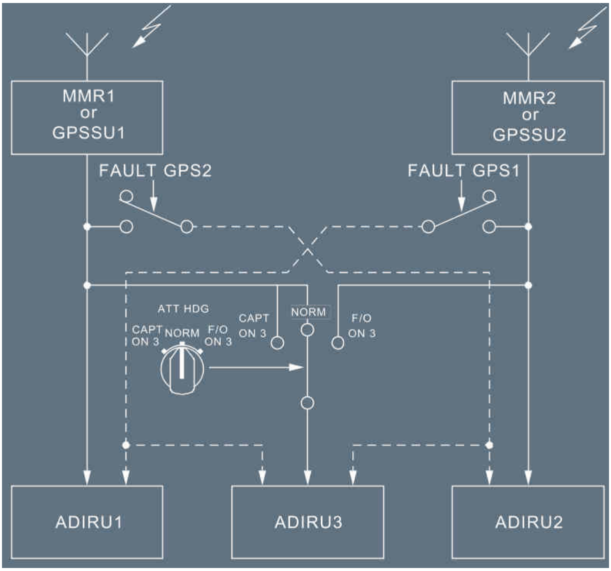
DESCRIPTION

Ident.: DSC-34-10-15-10-00018964.0001001 / 21 MAR 16
Applicable to: ALL

The Global Positioning System (GPS) is a satellite based radio navigation aid.
Worldwide 24 satellites broadcast accurate navigation data that the aircraft can use for the precise determination of its position.

The aircraft has two independent GPS receivers. Depending of the aircraft configuration, each receiver consists:
- Of a GPS Sensor Unit (GPSSU), or
- Is integrated in the Multi Mode Receiver (MMR). The GPS1 receiver in MMR1, and the GPS2 receiver in MMR2.

The GPSSU or the MMR processes the received data, and transfers them to the ADIRU. Then the ADIRU performs the GP-IRS hybrid position calculation. The FMGEC uses this hybrid position.


MMR1
or
GPSSU1
MMR2
or
GPSSU2
FAULT GPS2
FAULT GPS1
ATT HDG
CAPT ON 3
NORM
F/O ON 3
CAPT ON 3
NORM
F/O ON 3
ADIRU1
ADIRU3
ADIRU2

OPERATIONS

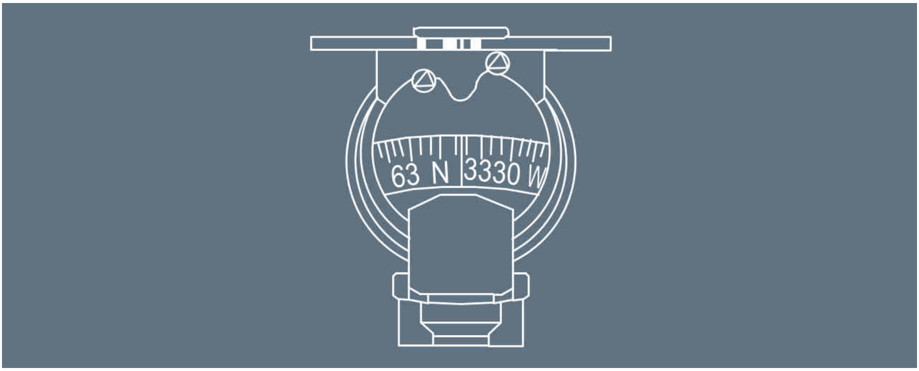
GPS information are available on the FMS – GPS Monitor Page. *Refer to DSC-22_20-50-10 Pages descriptions*.

- During normal operations
  The GPS receiver 1 supplies the ADIRU1 and the ADIRU3, and the GPS receiver 2 supplies the ADIRU2.
- In case of failure of one GPS receiver
  All ADIRUs use the operative GPS receiver.
- In case of failure of ADIRUs:
  - If the ADIRU1 fails, ADIRU3 is supplied by the GPS receiver 1, and ADIRU2 is supplied by the GPS receiver 2.
  - If the ADIRU2 fails, the ATT HDG selector has to be set to F/O 3 in order to maintain Side 1 and Side 2 segregation. In this case, the ADIRU3 will be supplied with GPS receiver 2.
  - If two ADIRUs fail, the remaining ADIRU is supplied by its own side GPS receiver.

COMPASS

Ident.: DSC-34-10-20-00019087.0001001 / 21 MAR 16
Applicable to: ALL

There is a compass located on top of the windshield center post.
The deviation card is located above the compass.

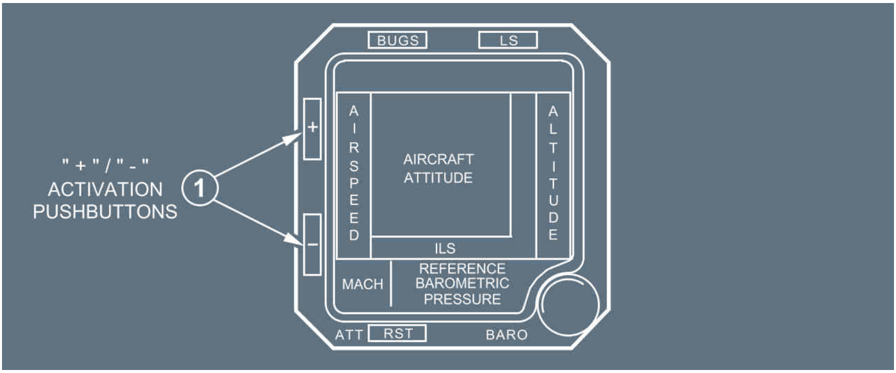


DESCRIPTION OF THE ISIS

Ident.: DSC-34-10-20-00019142.0001001 / 21 MAR 16
Applicable to: ALL

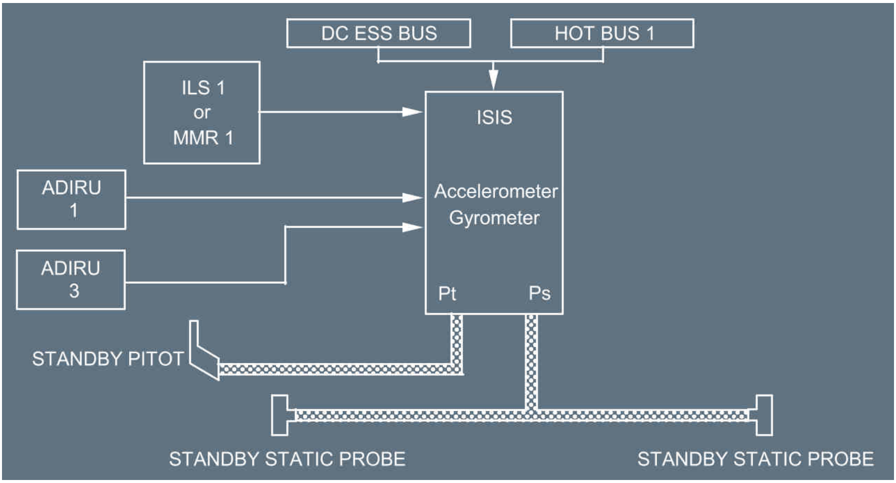
GENERAL

The ISIS system displays the following information:
- Attitude
- Airspeed and mach
- Altitude
- Barometric pressure
- LS function
- Bugs.


BUGS
LS
"+"/"-"
ACTIVATION
PUSHBUTTONS
1
+
−
AIRSPEED
AIRCRAFT
ATTITUDE
ALTITUDE
ILS
MACH
REFERENCE
BAROMETRIC
PRESSURE
ATT
RST
BARO

(1) "+"/"-" activation pushbuttons
Two pushbuttons, labelled "+" and "-", are used to adjust the level of brightness.
This brightness of the screen automatically adjusts after power-up tests. This is because of the photosensitive cell located on the surface of the ISIS system display.
The "+" and "-" pushbuttons then allow this initial brightness to be manually adjusted and changed.

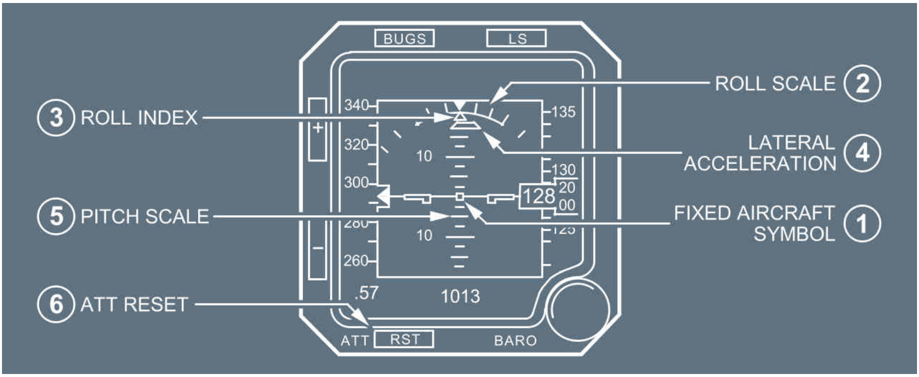
ARCHITECTURE


DC ESS BUS
HOT BUS 1
ILS 1
or
MMR 1
ISIS
ADIRU
1
ADIRU
3
Accelerometer
Gyrometer
Pt
Ps
STANDBY PITOT
STANDBY STATIC PROBE
STANDBY STATIC PROBE

ATTITUDE

Ident.: DSC-34-10-20-00019144.0003001 / 17 MAY 21
Applicable to: ALL

Note: *When leveling the wings, after performing a small turn of a small bank angle, the displayed roll attitude may temporarily be incorrect by a few degrees.*


BUGS
LS
ROLL SCALE ②
③ ROLL INDEX
LATERAL ACCELERATION ④
⑤ PITCH SCALE
FIXED AIRCRAFT SYMBOL ①
⑥ ATT RESET
340
320
300
280
260
135
130
128
20
00
125
10
10
.57
1013
ATT
RST
BARO

(1) Fixed aircraft symbol
The fixed aircraft symbol is in black, and outlined in yellow.
Depending of the aircraft configuration, the center of the fixed aircraft symbol is a point (like on the illustration above) or "V-bars".

(2) Roll scale
The roll scale is in white.
The markers are at 0 (small yellow triangle), 10, 20, 30, 45, 60 ° of bank.

(3) Roll index
The roll index is in black, and outlined in white. It indicates the bank angle.

(4) Lateral acceleration index
The trapezoidal index moves beneath the roll index. It represents the aircraft's lateral acceleration.

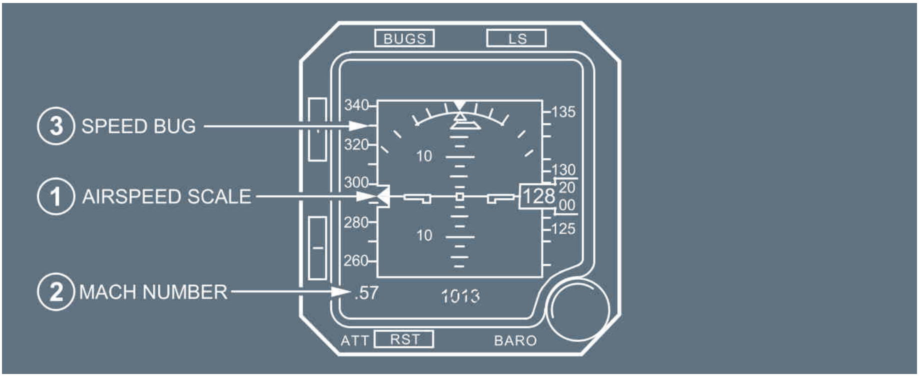
(5) Pitch scale
The pitch scale is in white. The scale shows markers every 2.5 °, between 30 ° nose up and 30 ° nose down. Beyond 30 °, large red arrowheads (V-shaped) indicate that the attitude has become excessive, and show the direction to follow in order to reduce it. The minimum pitch scale displayed is -17.5 ° +15 ° at 0 ° of pitch.

(6) ATT RST

The attitude indication can be reset by pressing this pushbutton for at least 2 s. The aircraft must be level during this procedure. During the reset time (approximately 10 s), the “ATT 10s” message is displayed on the screen. This pushbutton is also used to realign the system, if excessive aircraft movement is detected during the alignment phase.

AIRSPEED

Ident.: DSC-34-10-20-00019147.0002001 / 12 MAY 23
Applicable to: ALL



(1) Airspeed scale

A white scale moves in front of a yellow triangle indicating the airspeed. The scale ranges from 30 to 250 kt, with a mark every 5 kt, and from 250 to 520 kt, with a mark every 10 kt.

(2) Mach Number

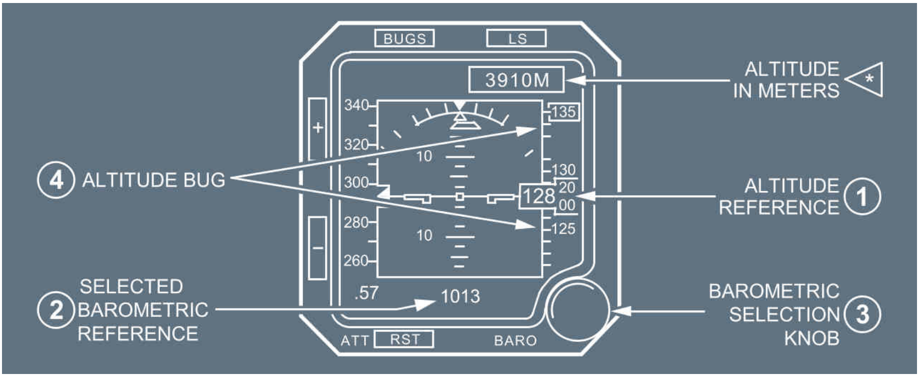
The Mach number is displayed in green when it goes above 0.5. And it disappears when it goes below 0.45.

(3) Speed bug

When a speed bug is entered via the BUGS function, the corresponding speed mark is indicated by a cyan dash.

ALTIMETER

Ident.: DSC-34-10-20-00019153.0002001 / 21 MAR 16
Applicable to: ALL


BUGS
LS
3910M
ALTITUDE
IN METERS
*
340
320
300
280
260
10
10
135
130
128
20
00
125
+
4 ALTITUDE BUG
ALTITUDE
REFERENCE 1
SELECTED
2 BAROMETRIC
REFERENCE
.57
1013
BAROMETRIC
SELECTION 3
KNOB
ATT
RST
BARO

(1) Altitude indication
The altitude indication is given as a white moving scale, and a green digital readout on a grey background.
The altitude scale ranges from -2 000 ft to 50 000 ft, every 100 ft, with digital altitude indications every 500 ft.
For negative altitudes, “NEG” appears in the window in white.
The altitude box changes to cyan, when it also corresponds to a bug value.
Depending of the aircraft configuration, the altitude in meters is displayed above the altitude scale.

(2) Barometric reference
The barometric reference is displayed in cyan.

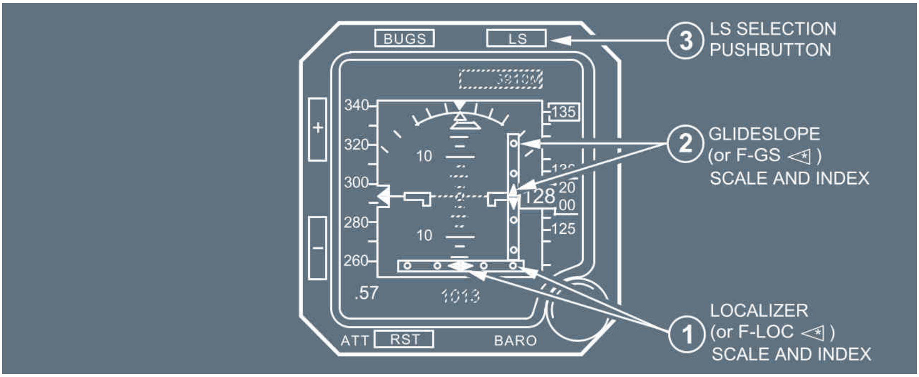
The displayed barometric reference is:
- The standard barometric reference "STD", or
- Depending of the aircraft configuration, the barometric pressure in "hPa" or "hPa / inHg".

(3) Barometric selection knob
This knob enables the selection of a barometric pressure, setting a variation of 10 hPa per knob rotation.
The standard barometric pressure can be selected by pressing the barometric knob. “STD” is then displayed, in place of the pressure value.
Pressing the knob again will display the selected barometric pressure.

(4) Altitude bug
When an altitude bug is entered through the bugs function, the corresponding altitude mark is indicated by a cyan dash, or by a cyan box when the dash covers the digital indication on the scale.

LANDING SYSTEM FUNCTION

Ident.: DSC-34-10-20-00019157.0002001 / 21 MAR 16
Applicable to: ALL


BUGS
LS
3910M
340
320
300
280
260
.57
1013
135
130
128
20
00
125
10
10
+
-
ATT
RST
BARO
3 LS SELECTION PUSHBUTTON
2 GLIDESLOPE (or F-GS ◁) SCALE AND INDEX
1 LOCALIZER (or F-LOC ◁) SCALE AND INDEX

(1) Localizer / scale and index

(2) Glideslope / scale and index
When the LS pb is pressed, the deviation scales are displayed.
When deviation scales are displayed and the LS deviations are valid, the indexes appear.

The LS deviations that are displayed correspond to the LS approach:
- Selected on the MCDU, or
- Tuned on the RMP.

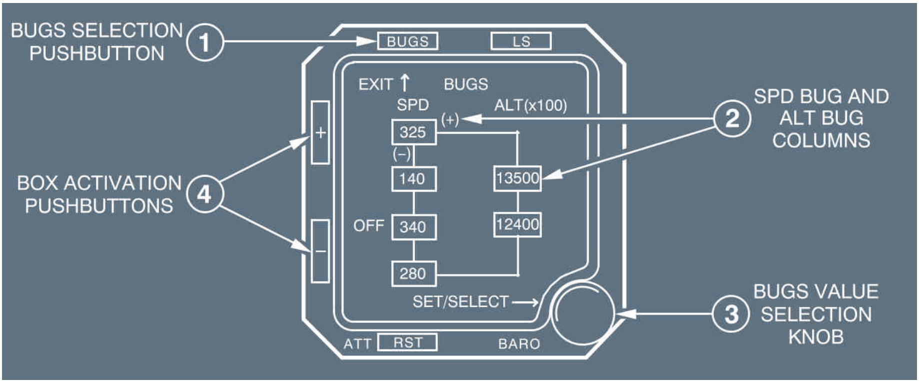
Note: The LS approach corresponds to either ILS approach, or GLS ◁ approach, or non precision approach using FLS ◁ .

(3) LS selection pushbutton
Pressing the LS pb will display the LS scales. Pressing the LS pb again will remove the LS scales.

CAUTION	Do not use the ISIS LS for takeoff using the localizer of the opposite runway, or for a back-course localizer approach. The LOC deviations are given in the wrong sense.

BUGS FUNCTION

Ident.: DSC-34-10-20-00001083.0001001 / 19 DEC 12
Applicable to: ALL


BUGS SELECTION PUSHBUTTON
1
BUGS
LS
EXIT
BUGS
SPD
ALT(x100)
(+)
325
(-)
140
13500
OFF
340
12400
280
SET/SELECT
SPD BUG AND ALT BUG COLUMNS
2
BOX ACTIVATION PUSHBUTTONS
4
+
−
BUGS VALUE SELECTION KNOB
3
ATT
RST
BARO

(1) BUGS function selection pushbutton
Pressing the BUGS pushbutton will activate the BUGS function, and display the bug values to be selected.

(2) SPD BUG and ALT BUG columns
The SPD BUG column gives four speed values (in knots) that can be selected by the crew.
The ALT BUG column gives two altitude values (feet) to be selected by the crew.

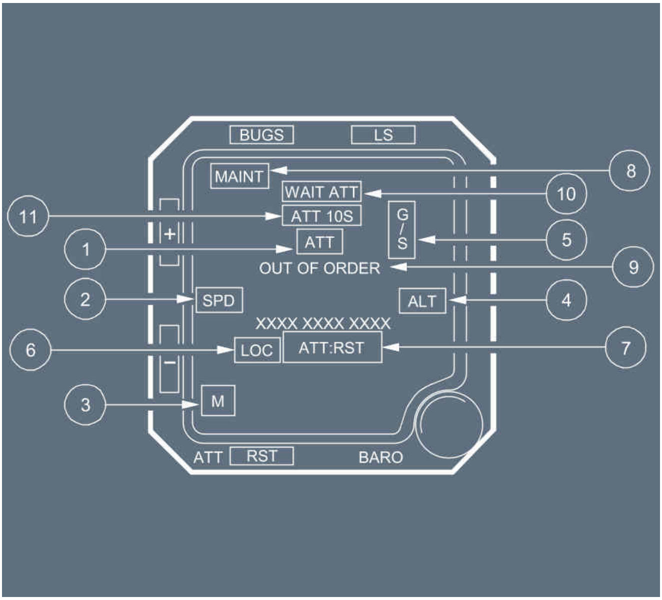
(3) BUGS value selection knob
It allows the bug value to be set by rotating the BARO knob. This value cannot be lower than 30 kt for a speed bug, or a negative value for an altitude bug.
Pressing the BARO setting knob, once a bug value box is activated, will deselect the bug value. The "OFF" label comes on close to the activated box.
The entered values are memorized by the system, when exiting the screen, by pressing the BUGS pushbutton (1), or after 15 s without any pilot action.

(4) "+"/"-" box activation buttons
Access from one box to another is obtained by pressing the "+" or "-" pushbutton.
When a bug value is entered, access to the next box is obtained by pressing the "-" pushbutton. The box becomes active and flashes.
The "+" pushbutton can be used to return to a previous box.

Note: *Use of the ISIS bugs function is not recommended because, in the event that both PFDs are lost in flight, when the ISIS bugs were previously set for takeoff, then for the approach, the bugs would remain at the takeoff characteristic speed settings.*

FLAGS

Ident.: DSC-34-10-20-00001086.0012001 / 09 APR 15
Applicable to: ALL


BUGS
LS
MAINT
WAIT ATT
ATT 10S
ATT
G / S
OUT OF ORDER
SPD
ALT
XXXX XXXX XXXX
LOC
ATT:RST
M
ATT
RST
BARO
+
−
1
2
3
4
5
6
7
8
9
10
11

(1) ATT flag (red)
When attitude data is lost, the red ATT flag appears.

(2) SPD flag (red)
When airspeed data is lost, the red SPD flag appears.

(3) M flag (red)
When Mach number is lost, the red M flag appears.

(4) ALT flag (red)
When altitude data is lost, the red ALT flag appears.

(5) G/S flag (red)

When glideslope information is lost, the red G/S flag appears.

(6) LOC flag (red)

When localizer data is lost, the red LOC flag appears.

(7) ATT: RST (yellow)

The "ATT": RST flag appears:

- When excessive aircraft movement is detected during the alignment phase, or
- After 350 h of continuous electrical supply, or
- When the “WAIT ATT” flag is displayed during more than 10 s.

In the above cases, press the ATT RST pb to reset/realign and recover the attitude indication.

(8) MAINT flag (white)

Maintenance required. This “MAINT flag” does not affect ISIS operation.
Displayed only on ground phase (speed < 60 kt).

(9) OUT OF ORDER (white)

When an internal failure of the ISIS indicator occurs, the “OUT OF ORDER” message appears, accompanied by a fault code.

(10) WAIT ATT flag (yellow)

If the ISIS looses attitude data, its entire sphere is cleared to display the: “WAIT ATT” flag.

- If the “WAIT ATT” flag is displayed during less than 10 s, a normal operation is recovered.
- If attitude data are lost for more than 10 s, the “WAIT ATT” flag is then replaced by the “ATT: RST” flag.

(11) ATT 10 s flag (yellow)

This count down flag appears, when the flight crew press the ATT RST pb, in order to indicate that the attitude reset function is in progress.

Intentionally left blank

GENERAL

Ident.: DSC-34-10-30-10-00019185.0001001 / 20 MAR 17
Applicable to: ALL

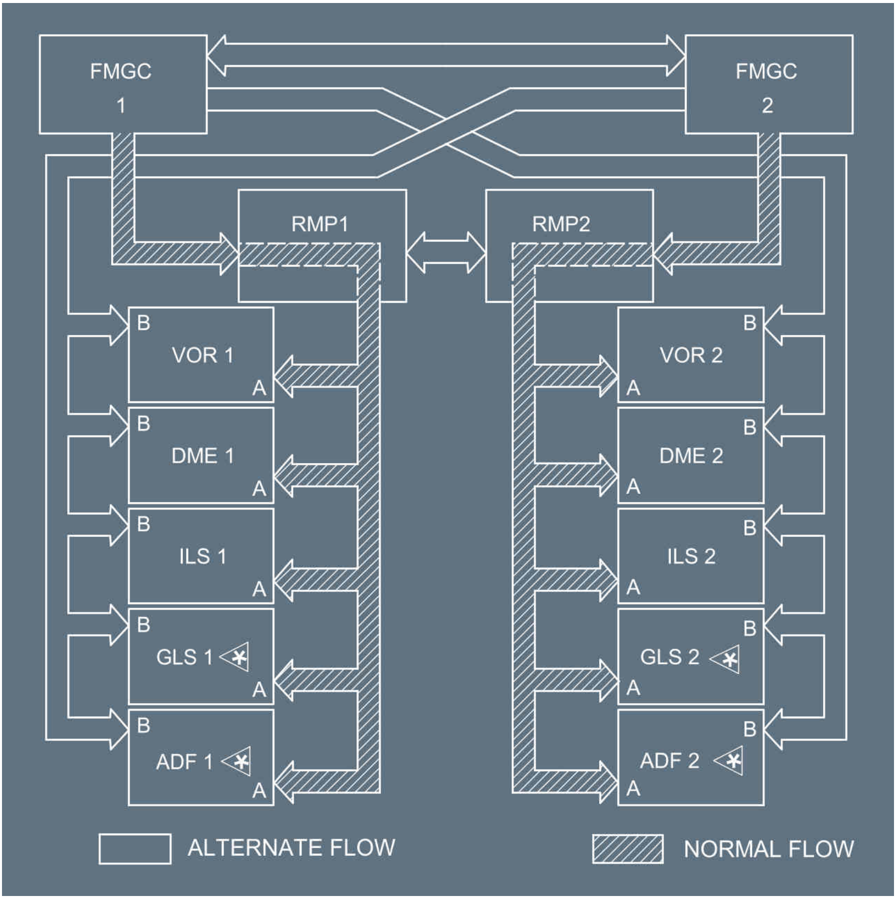
Three modes of tuning are available:

1. **Automatic Tuning**
   This is the basic means for tuning navaids.
   In normal operation, the FMGEC tunes navaids automatically, with each FMGEC controlling its own receivers.
   If one FMGEC fails, the remaining FMGEC controls both sides receivers, after activation of the FM selector switch.
2. **Manual Tuning**
   The flight crew can use the MCDU to override the automatic tuning of navaids by FMGEC in order to select a specific navaid for visual display.
   This does not affect the automatic function of the FMGEC.
   Any entry on one MCDU is sent to both FMGEC in dual mode, or the remaining FMGEC in single mode.
3. **Back Up Tuning**
   If both FMGECs fail, the flight crew can use the RMPs (Radio Management Panels 1 and 2) on the pedestal for back up tuning.
   The CAPT RMP controls VOR1 and ADF1 ◁ .
   The F/O RMP controls VOR2 and ADF2 ◁ .
   Either RMP controls both ILS/GLS ◁ , provided "STBY NAV" is selected on RMP1 and RMP2.
   RMP3 ◁ is not used for navaids tuning.

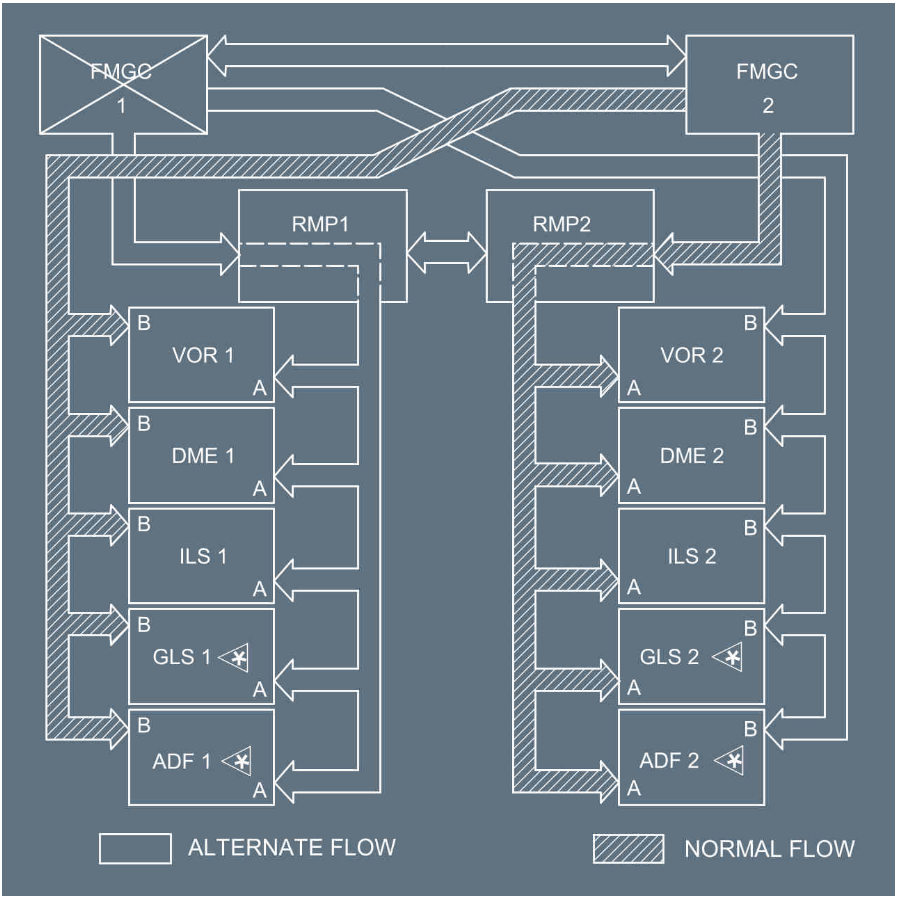
ARCHITECTURE

Ident.: DSC-34-10-30-10-00019189.0001001 / 21 MAR 16
Applicable to: ALL

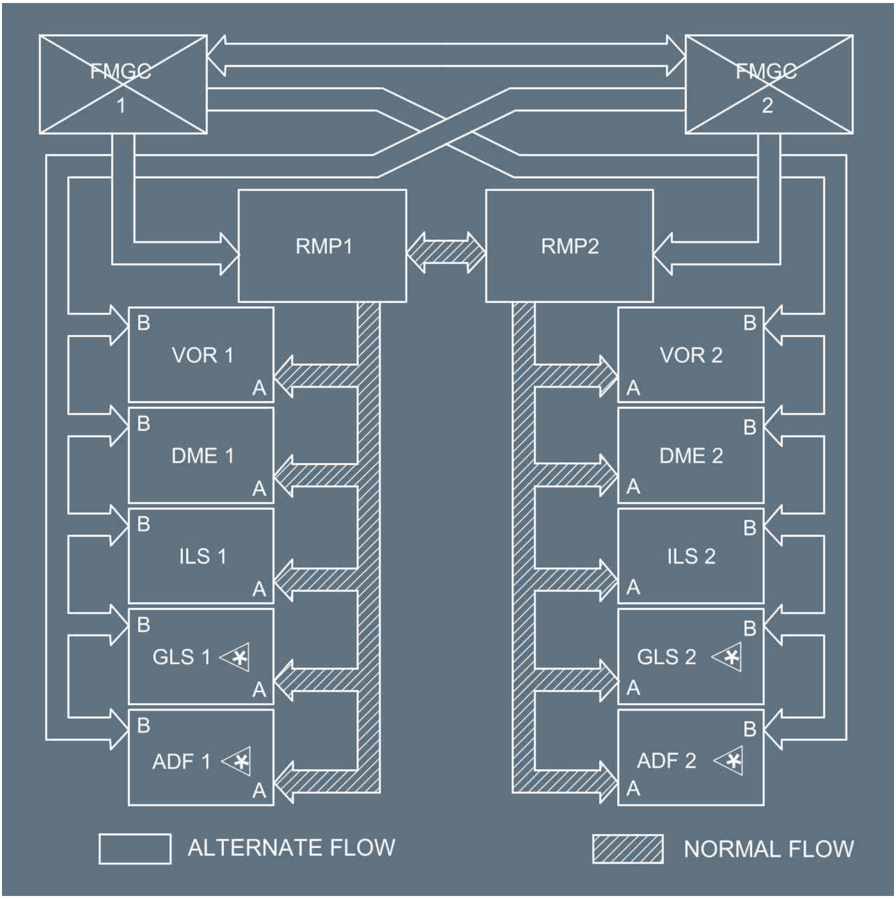
NORMAL OPERATION


FMGC 1
FMGC 2
RMP1
RMP2
VOR 1
DME 1
ILS 1
GLS 1
ADF 1
VOR 2
DME 2
ILS 2
GLS 2
ADF 2
A
B
ALTERNATE FLOW
NORMAL FLOW

FMGEC 1 FAILURE


FMGC
1
FMGC
2
RMP1
RMP2
B
VOR 1
A
B
DME 1
A
B
ILS 1
A
B
GLS 1
A
B
ADF 1
A
B
VOR 2
A
B
DME 2
A
B
ILS 2
A
B
GLS 2
A
B
ADF 2
A
ALTERNATE FLOW
NORMAL FLOW

BACK UP TUNING


FMGC 1
FMGC 2
RMP1
RMP2
B
VOR 1
A
B
DME 1
A
B
ILS 1
A
B
GLS 1
A
B
ADF 1
A
B
VOR 2
A
B
DME 2
A
B
ILS 2
A
B
GLS 2
A
B
ADF 2
A
ALTERNATE FLOW
NORMAL FLOW

VOR

Ident.: DSC-34-10-30-20-00019194.0001001 / 03 NOV 23
Applicable to: ALL

The aircraft has two VOR receivers.
The NDs display VOR 1 and VOR 2 information, in accordance with the position of the ADF ◁ /VOR sw on the EFIS control panel (*Refer to DSC-31-50 EFIS Control Panel*).
The DDRMI ◁ also displays VOR 1 and VOR 2 bearings, if the heading signal is valid.

ILS / GLS ◁

Ident.: DSC-34-10-30-20-00019195.0001001 / 29 MAY 20
Applicable to: ALL

The aircraft has two ILS/ GLS ◁ receivers.

Note: *When the aircraft is equipped with MMRs, ILS and GLS ◁ receivers are in the MMRs (ILS1/ GLS 1 ◁ in the MMR1 and the ILS2/ GLS 2 ◁ in the MMR2)*

- PFD1 and ND2 display ILS1/ GLS 1 ◁ information.
- PFD2 and ND1 display ILS2/ GLS 2 ◁ information.
- The PFD displays the ILS/ GLS ◁ information if the flight crew presses the LS pb or ILS pb (depending on the aircraft configuration) on the EFIS control panel (*Refer to DSC-31-50 EFIS Control Panel*).
- The NDs display ILS/ GLS ◁ information if the flight crew selects the ROSE LS mode or the ROSE ILS mode (depending on the aircraft configuration) on the EFIS control panel (*Refer to DSC-31-50 EFIS Control Panel*).

ADF ◁

Ident.: DSC-34-10-30-20-00019207.0001001 / 03 NOV 23
Applicable to: ALL

The aircraft may be fitted with one ADF ◁ or two ADFs ◁ .
The NDs display ADF ◁ information, depending on the position of the ADF ◁ /VOR sw on the EFIS control panel. *Refer to DSC-31-45 Rose Modes*.
The DDRMI ◁ also displays ADF 1 ◁ and ADF 2 ◁ bearings, depending on the position of the ADF ◁ /VOR sw on the DDRMI ◁ .

DME

Ident.: DSC-34-10-30-20-00019211.0001001 / 20 MAR 17
Applicable to: ALL

The aircraft has two DMEs.

The frequency that is automatically set on the DME corresponds to the frequency/channel that is set on the VOR, or ILS, or GLS ◁ .
One DME receiver is capable to tune simultaneously several frequencies from different DME ground stations.
Some frequencies are tuned for FMS radio position computation in VOR/DME mode and in DME/DME mode. Other frequencies are tuned for VOR/DME display and ILS/DME display.
The NDs and the DDRMI ◁ can display DME information associated with VOR,
The PFDs can display DME information associated with ILS/ GLS ◁ *Refer to DSC-31-40 Trajectory Deviation - ILS Approach (Cont'd)*

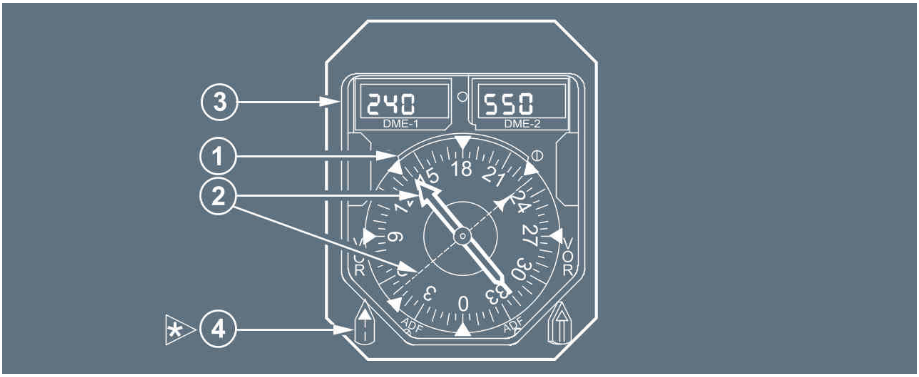
MARKER BEACON

Ident.: DSC-34-10-30-20-00019212.0001001 / 21 MAR 16
Applicable to: ALL

One marker beacon system is included in VOR receiver 1.
The PFD displays the outer, middle and inner marker signals (*Refer to DSC-31-40 Trajectory Deviation - ILS Approach (Cont'd)*).

DIGITAL DISTANCE AND RADIO MAGNETIC INDICATOR (DDRMI) ◁✳

Ident.: DSC-34-10-30-30-00019213.0001001 / 21 MAR 16
Applicable to: ALL



(1) Compass Card
ADIRU1 normally supplies the signal that positions the compass card.
ADIRU3 supplies this signal when selected by the ATT HDG SWITCHING selector.
Heading reference is in MAG or TRUE as selected by the NORTH REF pb-sw.

(2) Bearing Pointers
Indicate the magnetic bearing to the station received by VOR1 or ADF1 ◁✳ (dashed pointer) and VOR2 or ADF2 ◁✳ (double pointer).

Note: *Depending on the quality of the VOR beacon's signal, and mainly at distances greater than 25 NM from the station, the processing of the signal, on aircraft equipped with COLLINS or BENDIX VOR may lead to bearing pointer oscillations.*

(3) DME1(2) Counters
Indicates distance in nautical miles to/from DME station.

The counters indicate distances:
- in NM when the station is at more than 20 NM
- 1/10 th of NM when the station is at less than 20 NM

When the station is at less than 1 NM, 0 is shown.
The DME1 and DME2 displays are blanked or dashed when a fault is detected or data invalid.

(4) VOR/ADF Selector ◁

- VOR1 or ADF1 ◁ on the dashed pointer.
- VOR2 or ADF2 ◁ on the double pointer (if ADF2 is not installed, then ADF1 may be selected).

The DDRMI has also VOR/ADF flags and HDG flags when the associated information is not available

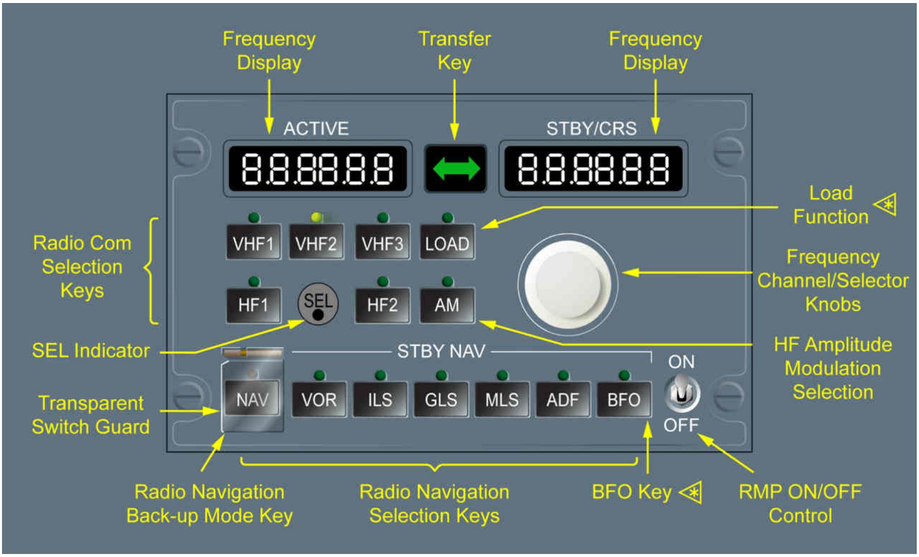
The indicators display these flags if:
- The VOR or ADF receiver fails (associated to the VOR/ADF flag only),
- The DDRMI has an internal failure,
- The heading signal from ADIRS is not valid,
- The power supply fails.

As long as the VOR/ADF flag is shown, and depending of the aircraft configuration, the associated bearing pointer remains:
- At the last valid position, or
- Into the horizontal line.

Note: *In EMER ELEC configuration, only the VOR1 or ADF1 ◁ are available, according to the position of the VOR1/ADF1 selector.*

RADIO MANAGEMENT PANEL (RMP)

Ident.: DSC-34-10-30-30-00019215.0001001 / 03 NOV 23
Applicable to: ALL


Frequency Display
Transfer Key
Frequency Display
ACTIVE
STBY/CRS
888888
888888
Load Function
Radio Com Selection Keys
VHF1
VHF2
VHF3
LOAD
Frequency Channel/Selector Knobs
HF1
SEL
HF2
AM
SEL Indicator
STBY NAV
HF Amplitude Modulation Selection
Transparent Switch Guard
NAV
VOR
ILS
GLS
MLS
ADF
BFO
ON
OFF
Radio Navigation Back-up Mode Key
Radio Navigation Selection Keys
BFO Key
RMP ON/OFF Control

ON/OFF sw

This switch controls the power supply to the panel.

NAV pb-sw (WITH TRANSPARENT SWITCHGUARD)

- Pressing this key engages the radio navigation backup mode. It takes control of the VOR, ILS, GLS ◁ and ADF ◁ receivers away from the FMGEC and gives it to the RMP. The green monitor light comes on.

  Note: *Pressing the MLS key has no effect.*

- Pressing the NAV key a second time returns control of the navigation radios to the FMGEC. The green monitor light goes off.

  Note:
  - *The flight crew must select this backup tuning mode on both RMP1 and RMP2 if both FMGECs or both MCDUs fail. In the emergency electrical configuration, only RMP1 receives power.*
  - *In the NAV backup mode, the flight crew can select radio communication systems as it would in the normal mode. Setting one RMP to NAV backup mode removes navaids tuning from both FMGECs.*
  - *Pressing the NAV key on RMP 3* ◁ *has no effect.*

RADIO NAVIGATION SELECTION KEYS

When the radio navigation back-up mode is on and the flight crew presses the VOR STBY NAV key, the ACTIVE window displays the VOR frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

When the radio navigation back-up mode is on and flight crew presses the ILS STBY NAV key, the ACTIVE window displays the ILS frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

When the radio navigation back-up mode is on and flight crew presses the GLS ◁ STBY NAV key, the ACTIVE window displays the GLS frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

When the radio navigation back-up mode is on and flight crew presses the MLS ◁ STBY NAV key, the ACTIVE window displays the MLS frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

When the radio navigation back-up mode is on and flight crew presses the ADF ◁ STBY NAV key, the ACTIVE window displays the ADF frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV key or COM key goes out.

STBY NAV KEYS

When the NAV key is on and the flight crew presses one of these STBY NAV keys, the ACTIVE window displays the frequency/channel to which that receiver is tuned. The green monitor light on the selected key comes on, and the one on the previously selected STBY NAV or COM key goes out.

FREQUENCY/CHANNEL SELECTOR KNOBS

Two concentric knobs allow the flight crew to preselect frequencies/channel for communication radios and stand-by navigation systems and select courses for VOR, ILS, GLS ◁ and MLS ◁ .
The desired frequency, channel or course is set in STBY/CRS window.
The outer and the inner knobs set a frequency/channel: the outer knob is for units, the inner knob is for decimals. The rate multiplier speeds up the tuning when the knob is rotated quickly.
Only outer knob can set a course.

AM PUSHBUTTON

If the aircraft has HF radios and the flight crew has selected an HF tranceiver, this switch selects the AM mode. (The default mode is the SB, or single side-band mode). This key displays a green monitor light when the AM mode is active.

SEL INDICATOR

The SEL indicator on both RMPs comes on amber when a transceiver normally associated with one RMP is tuned by another:

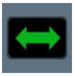
- VHF 1 tuned by RMP 2 or RMP 3,
- VHF 2 tuned by RMP 1 or RMP 3,
- VHF 3, HF 1, HF 2 (◁) tuned by RMP 1 or RMP 2.

RADIO COM SELECTION KEYS

When the pilot presses on these keys:

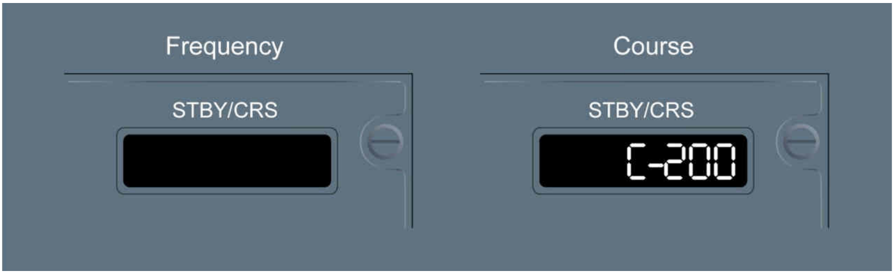
- The ACTIVE window displays the frequency set on that radio.
- The STBY/CRS window displays the selected standby frequency or course.
- The selected key displays a green monitor light.

TRANSFER KEY



The flight crew presses this key to interchange ACTIVE and STBY frequencies/channels. This action tunes the selected receiver to the new ACTIVE frequency/channel.

FREQUENCY DISPLAY (STBY/CRS WINDOW)



The flight crew can change the displayed frequency/channel by rotating the tuning knobs. The frequency/channel displayed in this window becomes the active frequency/channel when the flight crew presses the Transfer Key. If this window displays a course. then the ACTIVE window displays the associated frequency/channel.

Note: *If the STBY/CRS wnidow is displaying a course, then pressing the transfer key displays the active frequency/channel in both windows.*

FREQUENCY DISPLAY (ACTIVE WINDOW)

The ACTIVE display window shows the active frequency/channel of the selected navaid, which is identified by a green monitor light on the selection key.

LOAD FUNCTION

The flight crew can load the VHF frequency from the CPDLC CONTACT/MONITOR messages to the STBY/CRS window.

BFO KEY ◁

If the ADF ◁ is selected, pressing this key activates the BFO (Beat Frequency Oscillator). For most ADF, with BFO activated, the audio identification is heard. However there are some ADF where the BFO must be deactivated in order to hear the audio identification.

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GENERAL

Ident.: DSC-34-10-40-10-00019239.0001001 / 21 MAR 16
Applicable to: ALL

The aircraft has two radio altimeter (RA).
CAPT PFD displays the RA1 height, and the F/O PFD displays the RA2 height.
If one RA fails, both PFDs display the height from the remaining RA.
For indication on the PFD, *Refer to DSC-31-40 Altitude - Metric Altitude Indications (Cont'd)*.

AUTOMATIC CALLOUT

Ident.: DSC-34-10-40-10-00019240.0001001 / 20 MAR 17
Applicable to: ALL

GENERAL

The FWC generates a synthetic voice for radio height announcement below 2 500 ft. These announcements come through the cockpit loudspeakers, even if the speakers are turned off.

PREDETERMINED CALLOUT

The altitude callout uses the following predetermined threshold:

height (ft)	callout
2 500	TWO THOUSAND FIVE HUNDRED or TWENTY FIVE HUNDRED
2 000	TWO THOUSAND
1 000	ONE THOUSAND
500	FIVE HUNDRED
400	FOUR HUNDRED
300	THREE HUNDRED
200	TWO HUNDRED
100	ONE HUNDRED
80	EIGHTY
70	SEVENTY
60	SIXTY
50	FIFTY
40	FORTY
30	THIRTY
20	TWENTY
10	TEN
5	FIVE
DH (or MDA/MDH) +100	HUNDRED ABOVE
DH (or MDA/MDH)	MINIMUM

Note: *The reference altitude for callouts is the radio height for precision approaches (DH) and baro altitude (MDA/MDH) for non precision approaches.*

Pin programming enables Operators to select the required callouts.
If the aircraft remains at a height that is in the detection zone for a height callout, the corresponding message is repeated at regular intervals.

INTERMEDIATE CALLOUT

If the time between two consecutive predetermined callouts exceeds a certain threshold, the present height is repeated at regular intervals.

The threshold is:
- 11 s above 50 ft, or
- 4 s below 50 ft

The repeating interval is 4 s.

RETARD ANNOUNCEMENT

The loudspeaker announces RETARD:
- at 20 ft, or
- at 10 ft if the autothrust is active and one autopilot is in LAND mode.

AIRCRAFT SYSTEMS

SURVEILLANCE

Intentionally left blank

DSC-34-20-10 ATC

DSC-34-20-10-10 Description

Principle....................A
ADS-B OUT....................B

DSC-34-20-10-20 Controls and Indicators

Control Panel....................A
Memo Display....................B

DSC-34-20-10-30 Remote ATC Box

Remote ATC Box....................A

DSC-34-20-30 Weather Radar

DSC-34-20-30-10 Description

Description....................A

DSC-34-20-30-20 Predictive Windshear System

General....................A
Windshear Alerts during Takeoff Roll, up to 100 Knots....................B
Windshear Alerts above 50 Feet....................C
Windshear Alerts Inhibition....................D

DSC-34-20-30-30 Controls and Indicators

Control Panel....................A
Weather Radar indication on ND....................B
PWS ◁ indication on PFD and ND....................C
Memo Display....................D

DSC-34-20-40 GPWS

DSC-34-20-40-10 Description

Overview....................A
Principle....................B

DSC-34-20-40-20 GPWS Basic Modes

Mode 1 : Excessive Rate of Descent....................A
Mode 2 : Excessive Terrain Closure Rate....................B
Mode 3 : Altitude Loss After Takeoff....................C
Mode 4 : Unsafe Terrain Clearance when Not in Landing Configuration....................D
Mode 5 : Descent Below Glideslope....................E

Continued on the following page

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DSC-34-20-50 ROW/ROP

DSC-34-20-50-10 General

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DSC-34-20-60 TCAS

DSC-34-20-60-10 Description

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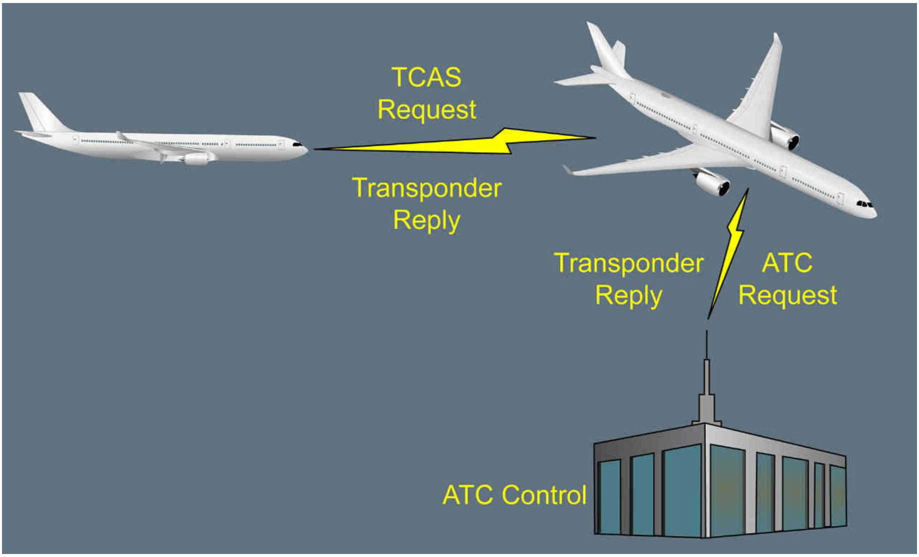
PRINCIPLE

Ident.: DSC-34-20-10-10-00020405.0002001 / 17 MAR 17
Applicable to: ALL

The aircraft has two ATC transponders (XPDR) which are controlled by a control panel (ATC/TCAS) on the center pedestal.
Only the selected XPDR operates.

The XPDR automatically responds to requests:
- From the ATC, to ensure effective air traffic surveillance
- From another aircraft that have a TCAS, to ensure that traffic alerts are triggered.



The XPDR is capable of elementary surveillance (ELS) and enhanced surveillance (EHS). It transmits the following data to the ATC center:
- The aircraft 24 bit address, the aircraft altitude, the flight number, the RA report
- The indicated airspeed, the Mach number, and the barometric vertical speed that are all supplied by the ADRs
- The magnetic heading, the roll angle, the ground speed, the track angle, the track angle rate, and the inertial vertical speed, that are all supplied by the IRs
- The selected altitude and barometric reference settings supplied by the FCUs.

ADS-B OUT

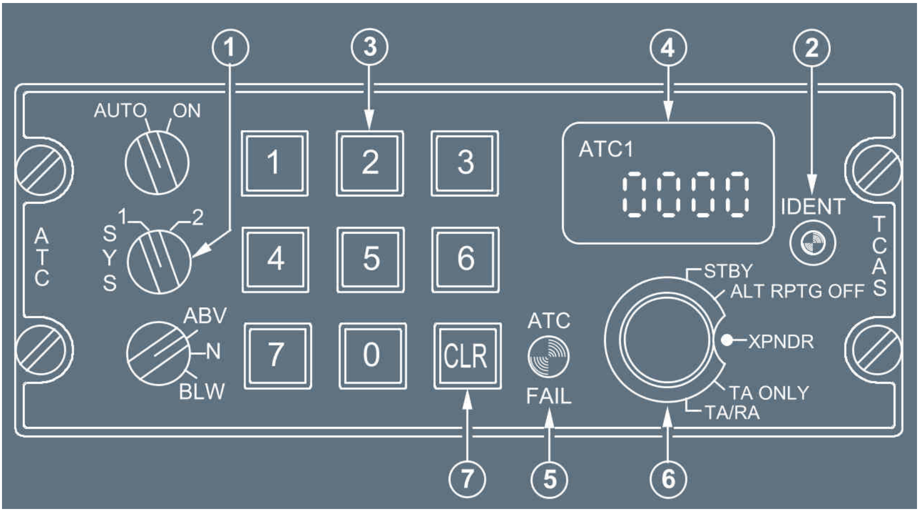
Ident.: DSC-34-20-10-10-00020406.0002001 / 22 MAR 17
Applicable to: ALL

With the ADS-B OUT capability, the Mode S transponders automatically and continuously transmit surveillance data, without preliminary interrogation, to:
- The ATC ground station
- Aircraft capable of ADS-B IN function.

The ADS-B OUT surveillance data that are automatically and continuously transmitted, include the following:
- The latitude and longitude, the Horizontal Integrity Limit (HIL), the difference between barometric altitude and geometric altitude, the ground speed, all supplied by GPS
- The barometric altitude supplied by ADIRS
- The track, the vertical speed, all supplied by the IRs
- The flight number (registered on the ATC flight plan and entered in the FMS during cockpit preparation) supplied by the FMS
- The emergency situation indicator
- The selected altitude and heading, the barometric pressure setting (QNH/QFE) from FCU.

CONTROL PANEL

Ident.: DSC-34-20-10-20-00020407.0009001 / 17 MAR 17
Applicable to: LV-KAN, LV-KAO


①
③
④
②
AUTO
ON
ATC1
0000
IDENT
T C A S
A T C
S Y S
1
2
1
2
3
4
5
6
7
0
CLR
ABV
N
BLW
ATC
FAIL
STBY
ALT RPTG OFF
XPNDR
TA ONLY
TA/RA
⑦
⑤
⑥

(1) SYS Selector
Selects XPDR 1 or 2.

(2) IDENT Switch
The flight crew presses this button to send the aircraft identification signal.

(3) Keypad
The flight crew uses the keypad to set the code assigned by ATC.

(4) Code Display
The window displays the selected code.

(5) ATC FAIL Light
This light comes on if the selected XPDR fails.

(6) Mode Selector

STBY : The two XPDR and the TCAS are electrically-supplied, but are not operating.

ALT RPTG OFF : No altitude data is transmitted.

XPNDR : On ground : The selected XPDR only operates in the selective aircraft interrogation mode of Mode S.

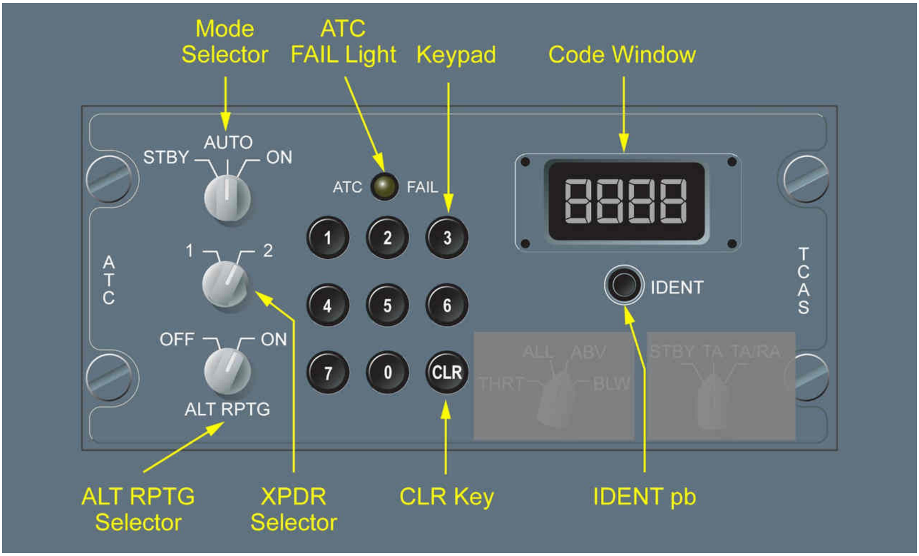
XPNDR : In flight : The selected XPDR operates.
Baro altitude data is transmitted.
XPDR 1 uses ADR 1 or ADR 3. XPDR 2 uses ADR 2 or ADR 3.
TCAS is on standby.

(7) CLR Key
The flight crew uses this key to clear the code display.

Note: As long as the four figures of the new code are not entirely written, the previous code remains.

CONTROL PANEL

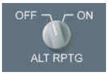
Ident.: DSC-34-20-10-20-00020407.0005001 / 04 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU


Mode Selector
ATC FAIL Light
Keypad
Code Window
STBY
AUTO
ON
ATC
FAIL
1
2
3
4
5
6
7
0
CLR
8888
IDENT
ATC
TCAS
1
2
OFF
ON
ALT RPTG
ALL
ABV
THRT
BLW
STBY
TA
TA/RA
ALT RPTG Selector
XPDR Selector
CLR Key
IDENT pb

ALT RPTG SELECTOR

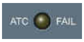
OFF
ON
ALT RPTG

The XPDR sends barometric standard altitude data.

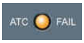


No altitude data transmission. The upper ECAM displays TCAS STBY during flight phases 2 and 7, or TCAS STBY during flight phase 6.

ATC FAIL LIGHT

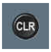


The selected XPDR is normal.



The selected XPDR fails.

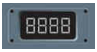
CLR KEY



The flight crew uses this key to clear the code window.

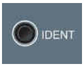
Note: *As long as the four figures of the new code are not entirely written, the previous code remains.*

CODE WINDOW



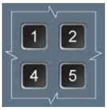
The code window displays the selected code.

IDENT PB



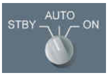
The flight crew presses this button to send the aircraft identification signal.

KEYPAD

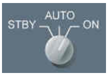


The flight crew uses the keypad to set the code assigned by ATC.

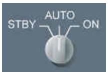
MODE SELECTOR



Both XPDRs are electrically supplied but not operating.



The selected XPDR operates.



In flight: The selected XPDR operates.
On ground: The selected XPDR only operates in mode S (Selective aircraft interrogation mode).

XPDR SELECTOR

	The XPDR 1 is selected.
	The XPDR 2 is selected.

MEMO DISPLAY

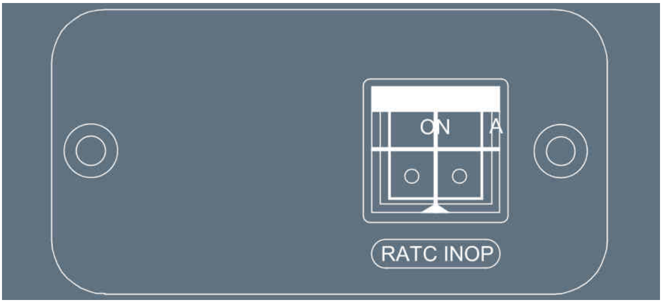
Ident.: DSC-34-20-10-20-00017201.0003001 / 21 MAR 16
Applicable to: ALL

TCAS STBY	This memo appears in amber in flight phase 6 when the ATC/XPDR used by the TCAS is faulty.
TCAS STBY	This memo appears in green in flight phases 2 and 7 when the ATC/XPDR used by the TCAS is faulty.

REMOTE ATC BOX

Ident.: DSC-34-20-10-30-00008512.0003001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

This control panel enabled the crew to easily and rapidly inform the ATC of a hijacking situation.
When one of the two pushbuttons was pressed, Transponder 1 emitted the Hijacking code (7500), via the remote ATC box that was powered by a secured power source.
This function is now deactivated.



Intentionally left blank

DESCRIPTION

Ident.: DSC-34-20-30-10-00014718.0004001 / 17 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

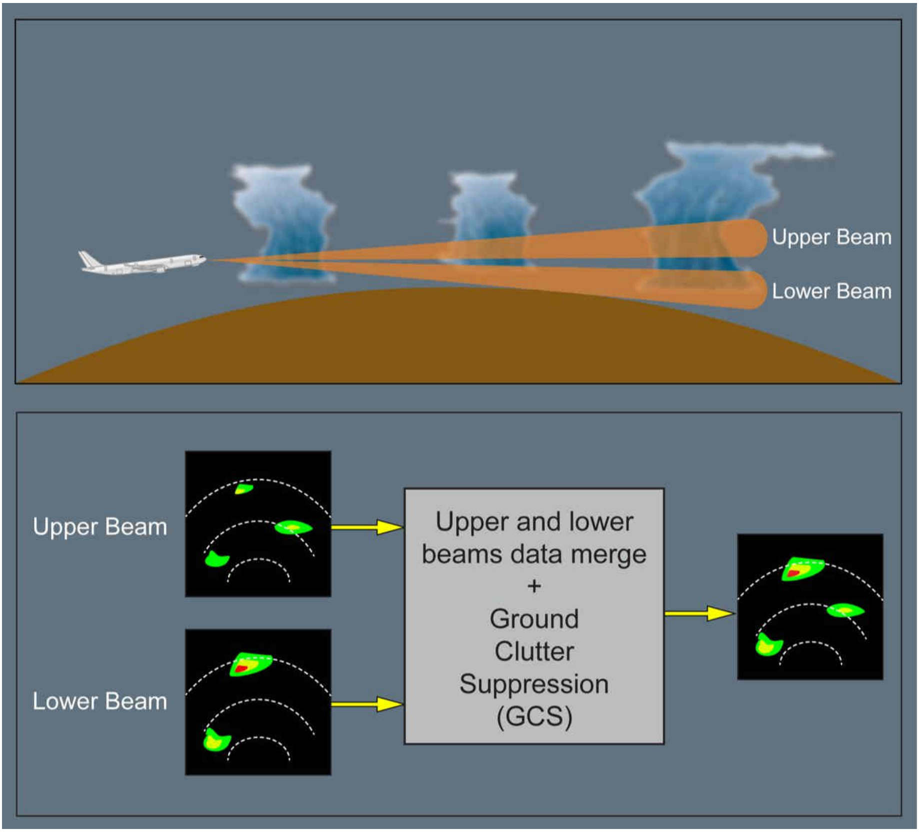
The aircraft is fitted with two Multiscan weather radar systems with a Predictive WindShear (PWS) function ◁ and a weather hazard prediction function ◁ .
The flight crew can display weather data on the CAPT and/or F/O NDs in either ARC or ROSE mode.
The flight crew can adjust the brightness of the weather image on the ND by rotating the outer knob of the ND Brightness Control knob (*Refer to DSC-31-50 EFIS DMC Panel*).

Note: *A low brightness setting of the weather display may reduce the visibility of weather data, and therefore reduce crew awareness of the weather situation.*

The flight crew can use the radar in the following modes:
- Multiscan Automatic mode: MULTISCAN sw set to AUTO (recommended), or
- Manual mode: MULTISCAN sw set to MAN.

When in Multiscan Automatic mode:
- The radar alternatively scans at two antenna tilt settings. The weather radar image that is displayed is the result of the stored and combined information from each beam.
- When the gain selector is set to the Calibrated position (CAL), the radar automatically adjusts the gain based on various parameters (aircraft altitude, geographical area, season, time of the day) to obtain the best weather display.
- To prevent unnecessary clutter display, the “Quiet and Dark cockpit” philosophy removes the weather that:
  - is not on the aircraft flight path
  - is not a threat to the aircraft (post convective cell).
- The Ground Clutter Suppression (GCS) function removes the ground returns from the ND.

Multiscan Principle


Upper Beam
Lower Beam
Upper Beam
Lower Beam
Upper and lower beams data merge
+
Ground Clutter Suppression (GCS)

When in Manual mode:

- The flight crew can adjust manually the antenna tilt settings, and can adjust gain either automatically or manually using knobs located on the radar control panel
- The GCS function is not available
- When the gain selector is set to CAL, there is no automatic gain adjustment based on altitude, geographical area, season and time of the day.

As a consequence, when the flight crew switches from the Multiscan Automatic mode with CAL gain to the Manual mode with CAL gain, the weather displayed on the ND may be significantly different.

DESCRIPTION

Ident.: DSC-34-20-30-10-00014718.0003001 / 17 MAY 21
Applicable to: LV-KHT, LV-KHU

The aircraft is fitted with two Autotilt weather radar systems with a Predictive WindShear (PWS) function ◁ .
The flight crew can display weather data on the CAPT and/or F/O NDs in either ARC or ROSE mode.
The flight crew can adjust the brightness of the weather image on the ND by rotating the outer knob of the ND Brightness Control knob (*Refer to DSC-31–50 EFIS DMC Panel*).

Note: *A low brightness setting of the weather display may reduce the visibility of weather data, and therefore reduce crew awareness of the weather situation.*

The flight crew can use the radar in either Autotilt (automatic) mode (recommended setting) or in Manual mode.

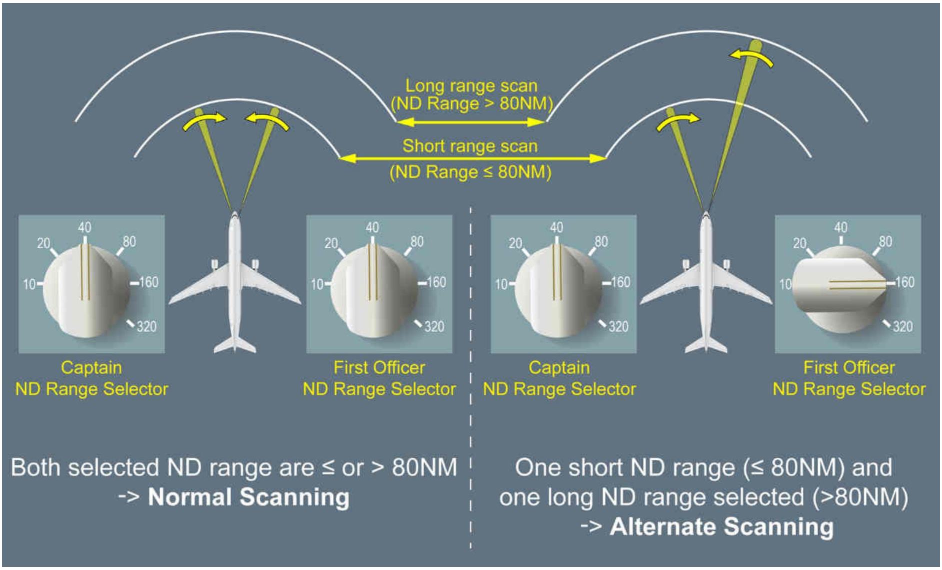
When in Autotilt mode:
- Using the EGPWS terrain database, the radar automatically adjusts the antenna tilt based on aircraft position, altitude, and the selected ND range
- Autotilt optimizes detection and display of weather based on aircraft flight phase, and reduces ground clutter
- Depending on the selected ND range and aircraft altitude, Autotilt optimizes the tilt for either short range or long range detection:

Selected ND range	10 NM	20 NM	40 NM	80 NM	160 NM	320 NM
Above 2 300 ft AGL	Tilt adjustment for short range detection				Tilt adjustment for long range detection	
Below 2 300 ft AGL	Tilt adjustment for short range detection + PWS scanning					

- When two different ranges are selected on CAPT and F/O ND, the radar scans alternatively at two different tilt settings. Each of these tilt setting is optimized for the selected range. This alternate scanning reduces the refresh rate of each ND image.

Note: Below 2 300 ft, PWS (if installed) scanning is active, alternate scanning is disabled.

Alternate scanning of the Autotilt according to ND range selection (above 2 300 ft)


Long range scan
(ND Range > 80NM)
Short range scan
(ND Range ≤ 80NM)
10
20
40
80
160
320
Captain
ND Range Selector
First Officer
ND Range Selector
Captain
ND Range Selector
First Officer
ND Range Selector
Both selected ND range are ≤ or > 80NM
-> **Normal Scanning**
One short ND range (≤ 80NM) and
one long ND range selected (>80NM)
-> **Alternate Scanning**

- On the ground, Autotilt adjusts the tilt to provide optimum detection of weather at 10 000 ft above ground level
- The flight crew can use either automatic gain (recommended default position) or manual gain for weather analysis.

When in Manual mode:
- The flight crew adjusts the antenna tilt settings manually
- The flight crew adjusts the gain either automatically or manually.

GENERAL

Ident.: DSC-34-20-30-20-00004757.0001001 / 21 MAR 17
Applicable to: LV-KHT, LV-KHU

The weather radar has a Predictive Windshear System (PWS) that operates when:
- The PWS sw is in the AUTO position (Even if the weather radar is OFF), and
- The aircraft is below 2 300 ft AGL, and
- The ATC is switched to the ON or AUTO position (or XPNDR ◁), and
- One engine is running.

Note: *When the selected weather radar fails, the flight crew can recover the PWS function by selecting the operative system on the radar control panel.*

The system scans the airspace for windshear within a range of 5 NM ahead of the aircraft.
When the system detects windshear, and depending on the range selected on the ND, a warning, caution or advisory message appears on the ND. Predictive windshear warnings and cautions are associated with an aural warning.
Predictive windshear warnings and cautions are associated to an aural alert and to a red (warning) or amber (caution) "W/S AHEAD" message on the PFD, whereas windshear advisories are only displayed on the ND (*Refer to DSC-34-20-30-30 PWS indication on PFD and ND*) without message on the PFD.

Alert Level	**Aural Warning**	**PFD**	**ND (*Refer to DSC-34-20-30-30 PWS indication on PFD and ND*)**
Warning (Approach)	«GO AROUND WINDSHEAR AHEAD»	W/S AHEAD (red)	Windshear icon
Warning (Takeoff)	«WINDSHEAR AHEAD» (twice)	W/S AHEAD (red)	Windshear icon
Caution	«MONITOR RADAR DISPLAY»	W/S AHEAD (amber)	Windshear icon
Advisory	Nil	Nil	Windshear icon

GENERAL

Ident.: DSC-34-20-30-20-00004757.0003001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The weather radar has a Predictive WindShear System (PWS) that operates when the PWS sw is in the AUTO position, and the aircraft radio height is below 2 300 ft, and
- Weather radar is ON (Radar sw on position 1 or 2), or
- Weather radar is OFF, and
  - At least one engine is running, and
  - Aircraft ground speed is greater than 30 kt, or
  - Aircraft longitudinal acceleration is above a given threshold during at least 0.5 s

Note: *When the selected weather radar fails, the flight crew can recover the PWS function by selecting the operative system on the Radar sw of the radar control panel.*

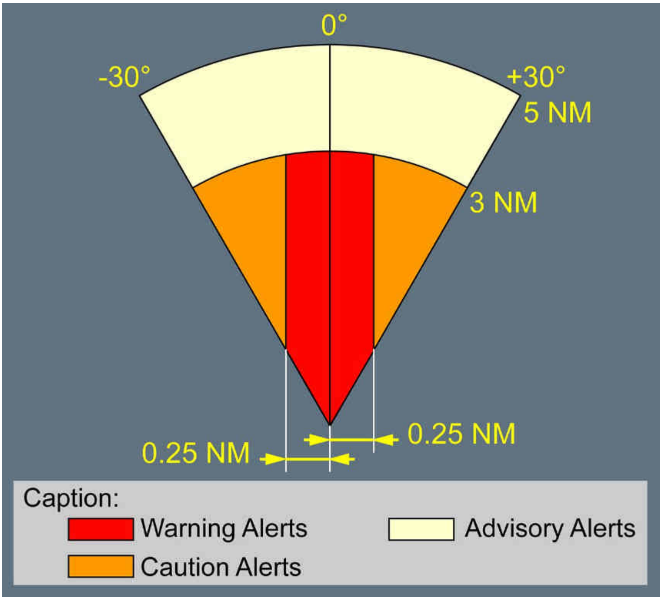
The system scans the airspace for windshear within a range of 5 NM ahead of the aircraft. When the system detects windshear, a windshear symbol appears on the ND (*Refer to DSC-34-20-30-30 PWS indication on PFD and ND*).
Predictive windshear warnings and cautions are associated to an aural alert and to a red (warning) or amber (caution) "W/S AHEAD" message on the PFD, whereas windshear advisories are only displayed on the ND (*Refer to DSC-34-20-30-30 PWS indication on PFD and ND*) without message on the PFD.

Alert Level	**Aural Warning**	**PFD**	**ND (*Refer to DSC-34-20-30-30 PWS indication on PFD and ND*)**
Warning (Approach)	«GO AROUND WINDSHEAR AHEAD»	W/S AHEAD (red)	Windshear icon
Warning (Takeoff)	«WINDSHEAR AHEAD» (twice)	W/S AHEAD (red)	Windshear icon
Caution	«MONITOR RADAR DISPLAY»	W/S AHEAD (amber)	Windshear icon
Advisory	Nil	Nil	Windshear icon

WINDSHEAR ALERTS DURING TAKEOFF ROLL, UP TO 100 KNOTS

Ident.: DSC-34-20-30-20-00004758.0001001 / 12 APR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Windshear Alerts during takeoff, up to 100 knots


0°
-30°
+30°
5 NM
3 NM
0.25 NM
0.25 NM
Caption:
Warning Alerts
Advisory Alerts
Caution Alerts

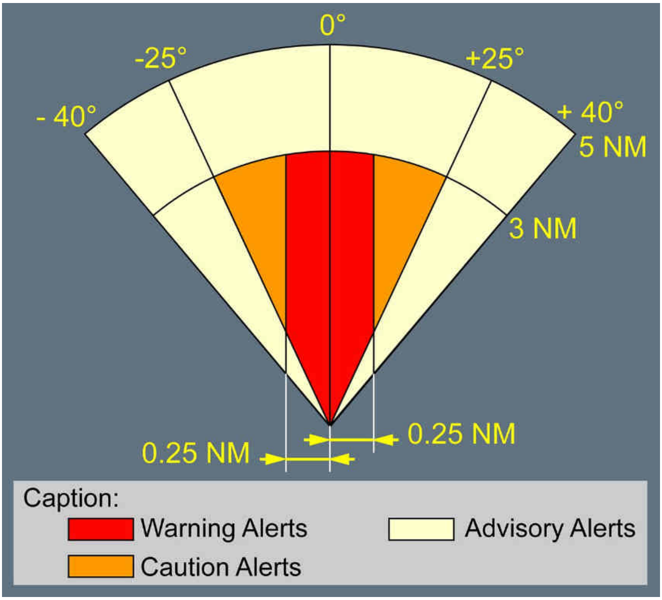
During the takeoff roll, up to 100 kt, both warnings and cautions are available within a range of 3 NM.

Note: *This is also applicable during taxi when weather radar is set to ON.*

WINDSHEAR ALERTS DURING TAKEOFF ROLL, UP TO 100 KNOTS

Ident.: DSC-34-20-30-20-00004758.0002001 / 12 APR 16
Applicable to: LV-KHT, LV-KHU

WIindshear Alerts during takeoff roll, up to 100 knots


0°
-25°
+25°
- 40°
+ 40°
5 NM
3 NM
0.25 NM
0.25 NM
Caption:
🟥 Warning Alerts
☐ Advisory Alerts
🟧 Caution Alerts

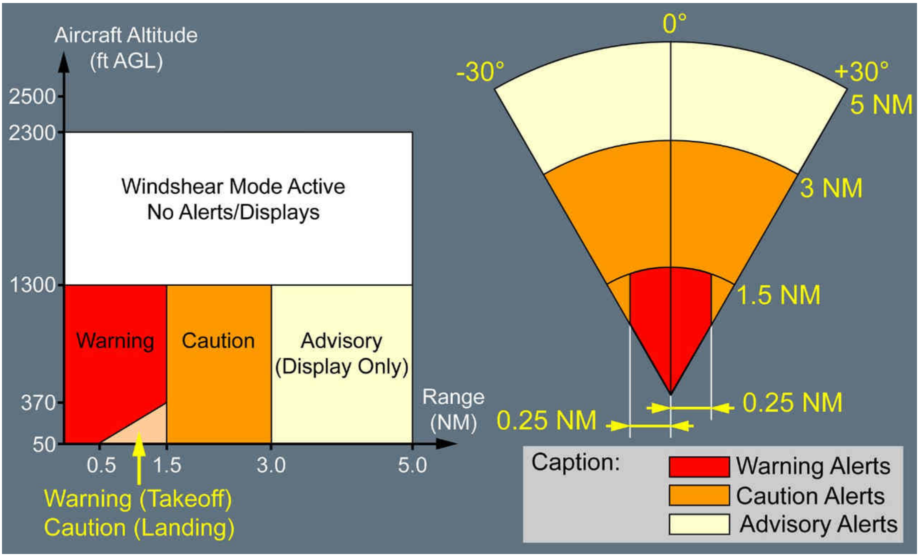
During the takeoff roll, up to 100 kt, both warnings and cautions are available within a range of 3 NM.

Note: *This is also applicable during taxi when CAPT or F/O display mode is different from OFF.*

WINDSHEAR ALERTS ABOVE 50 FEET

Ident.: DSC-34-20-30-20-00004759.0001001 / 05 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

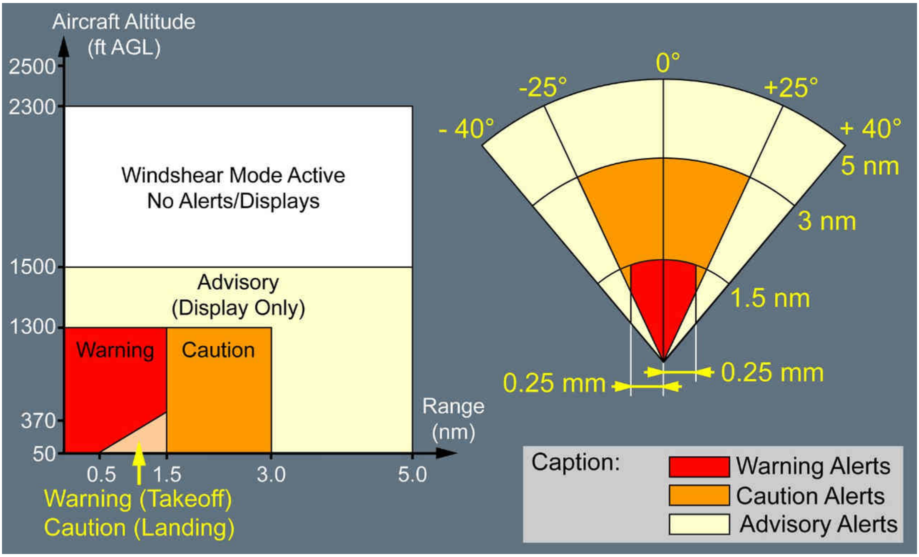
Windshear Alerts above 50 feet


Aircraft Altitude
(ft AGL)
2500
2300
1300
370
50
Windshear Mode Active
No Alerts/Displays
Warning
Caution
Advisory
(Display Only)
Range
(NM)
0.5
1.5
3.0
5.0
Warning (Takeoff)
Caution (Landing)
0°
-30°
+30°
5 NM
3 NM
1.5 NM
0.25 NM
0.25 NM
Caption:
Warning Alerts
Caution Alerts
Advisory Alerts

During final approach, the visual and aural warning alerts are downgraded to caution alerts between 370 ft AGL and 50 ft AGL, and range between 1.5 NM and 0.5 NM.

WINDSHEAR ALERTS ABOVE 50 FEET

Ident.: DSC-34-20-30-20-00004759.0002001 / 05 MAY 22
Applicable to: LV-KHT, LV-KHU


Aircraft Altitude
(ft AGL)
2500
2300
Windshear Mode Active
No Alerts/Displays
1500
Advisory
(Display Only)
1300
Warning
Caution
370
50
0.5
1.5
3.0
5.0
Range
(nm)
Warning (Takeoff)
Caution (Landing)
0°
-25°
+25°
- 40°
+ 40°
5 nm
3 nm
1.5 nm
0.25 mm
0.25 mm
Caption:
Warning Alerts
Caution Alerts
Advisory Alerts

During final approach, the visual and aural warning alerts are downgraded to caution alerts between 370 ft AGL and 50 ft AGL, and range between 1.5 NM and 0.5 NM.

WINDSHEAR ALERTS INHIBITION

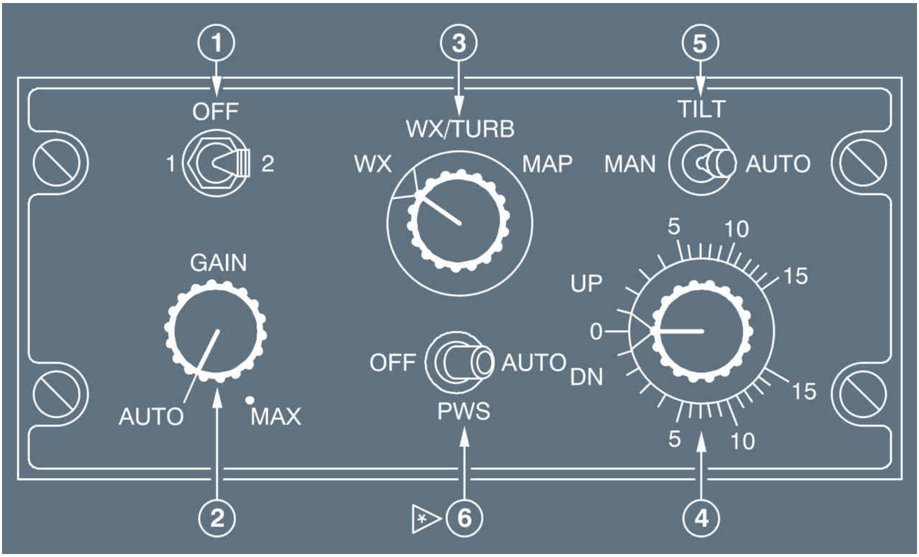
Ident.: DSC-34-20-30-20-00004760.0001001 / 14 OCT 15
Applicable to: ALL

At takeoff, alerts are inhibited above 100 kt and up to 50 ft.
During landing, alerts are inhibited below 50 ft.

The aural alerts of the Predictive WindShear System (PWS):
- Have priority over TCAS, GPWS and other FWC aural warnings
- Are inhibited by reactive windshear detection and aural messages of stall warnings.

CONTROL PANEL

Ident.: DSC-34-20-30-30-00014713.0004001 / 13 JAN 14
Applicable to: LV-KHT, LV-KHU



(1) Radar sw
This switch sets one radar to ON or turns off both radars.

(2) GAIN knob
This knob adjusts the sensitivity of the radar.
“AUTO” is the normal position; it adjusts the gain to a calibrated setting.

(3) Display Mode selector

WX : Weather mode:
Colors indicate the intensity of precipitation (black for the lowest intensity, green, amber and red indicate progressively higher intensities).

WX/TURB ◁* Weather and Turbulence mode:
The ND indicates precipitation and turbulence areas. Turbulence areas are displayed in magenta (within 40 NM).

MAP : Map mode:
The radar operates in ground mapping mode: Black indicates water, green indicates the ground, and amber indicates cities and mountains.

(4) TILT knob

The TILT knob adjusts antenna tilt above and below the horizon.
Zero indicates the horizon reference, as provided by the ADIRS.

(5) TILT Mode sw

AUTO : Automatically selects tilt to optimize weather detection and minimize ground clutter.

MAN : When set to MAN, the crew can then manually adjust the tilt by using the TILT knob.

(6) PWS sw

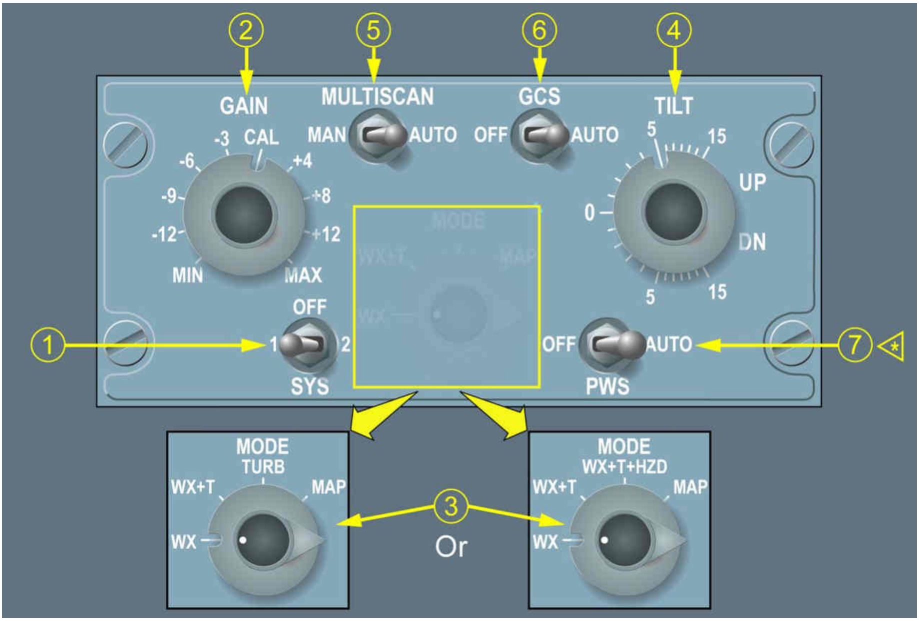
AUTO : Activates the predictive windshear function.
Windshear areas can be detected when radio height is below 1 500 ft, even if the Radar sw is set to off.

OFF : Turns off the predictive windshear function.

CONTROL PANEL

Ident.: DSC-34-20-30-30-00014713.0008001 / 01 MAR 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Control Panel


2
5
6
4
GAIN
MULTISCAN
GCS
TILT
-3 CAL
-6 +4
-9 +8
-12 +12
MIN MAX
MAN AUTO
OFF AUTO
5 15
UP
0
DN
5 15
OFF
1 2
SYS
OFF AUTO
PWS
1
7
MODE
TURB
WX+T MAP
WX
3
Or
MODE
WX+T+HZD
WX+T MAP
WX

(1) Radar sw
This switch sets one radar to ON or turns both radars to OFF.

(2) GAIN knob
This knob adjusts the sensitivity of the radar.

CAL is the normal position of the knob
- When in Multiscan Automatic mode and gain set to CAL, the radar automatically adjusts the gain according to various parameters (aircraft altitude, geographical area, season, time of the day) to obtain the best weather display.
- When in Manual mode and gain set to CAL, the radar adjusts the gain to a calibrated setting.

(3) Display Mode selector

WX : Weather mode:
Colors indicate the intensity of precipitation (black for the lowest intensity, green, amber and red indicate progressively higher intensity).

WX+T : Weather and Turbulence mode:
The ND indicates precipitation and turbulence areas. Turbulence areas are displayed in magenta (within 40 NM).

TURB ◁ : Turbulence mode:
The ND only displays turbulence areas. Turbulence areas are displayed in magenta (within 40 NM).

WX+T +HZD ◁ : Weather, Turbulence and Hazard mode (recommended position) :
The ND indicates precipitation, turbulence areas in magenta (within 40 NM) and hazard prediction risk areas.
Hazard prediction function is only available when the MULTISCAN sw is set to AUTO.

Note: When MULTISCAN sw is set to MAN, WX+T+HZD mode is equivalent to WX+T mode.

MAP : Map mode:
The radar operates in ground mapping mode: black indicates water, green indicates the ground, and amber indicates cities and mountains.

(4) TILT knob

This knob adjusts the antenna tilt when MULTISCAN sw is set to MAN.
Zero indicates the horizon reference, as provided by the IRS.

(5) MULTISCAN sw

AUTO : Activates Multiscan mode.
Multiscan controls the tilt automatically and combines two scans done at different tilt angles to optimize weather detection and minimize ground clutter.

MAN : When set to MAN, the crew can manually adjust the tilt by using the TILT knob.

(6) GCS sw

The Ground Clutter Suppression (GCS) switch is spring-loaded to the AUTO position.

AUTO :
- If MULTISCAN sw is set to AUTO, the radar is in normal use. Ground clutter is not displayed on the screen
- If MULTISCAN sw is set to MAN, the GCS sw has no utility. Ground clutter is displayed on the screen.

OFF : Ground clutter is displayed on the screen.

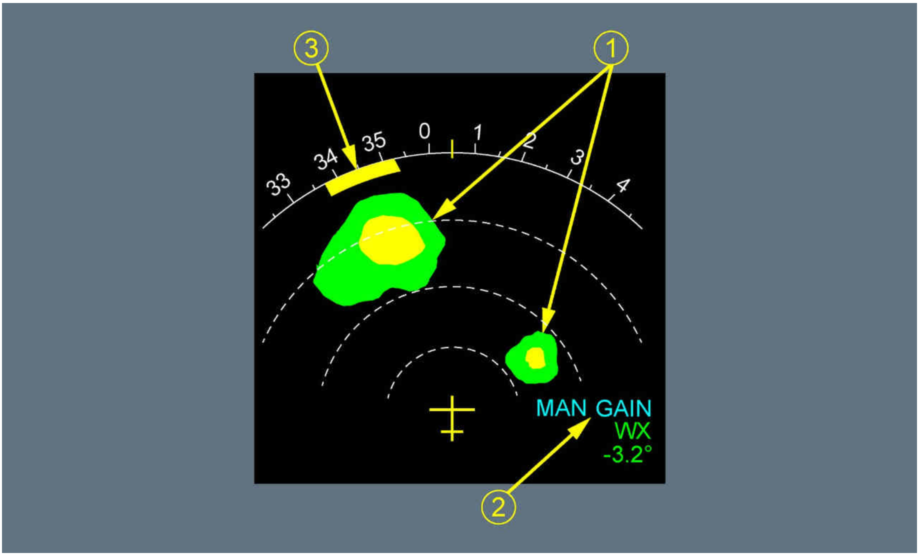
(7) PWS sw

AUTO : Activates the Predictive WindShear function in accordance with activation conditions.

OFF : The Predictive WindShear function is off.

WEATHER RADAR INDICATION ON ND

Ident.: DSC-34-20-30-30-00000745.0014001 / 03 MAY 23
Applicable to: LV-GIF



(1) Weather Radar Picture

- When the radar is operating, and when the ND is not in PLAN mode, the ND displays the weather radar picture.
- The weather echoes appear in different colors, depending on the precipitation rates (black, green, yellow, red or magenta for turbulence).
- The selected ND range will determine how often the image is refreshed.

(2) Weather Radar Indication

- 1st row: Gain Mode
  MAN GAIN appears when the flight crew selects the manual gain mode.
- 2nd row: Active Detection Modes
  The active detection modes appear in:

  - Blue when the MULTISCAN sw is on the MAN position, or
  - Green when the MULTISCAN sw is on the AUTO position.

  The active detection modes can be one of the following:
  - WX
  - WX+T
  - TURB ◁
  - PWS SCAN (when PWS function is active)
  - MAP
  - WX+T+H ◁
  - WXR OFF

  Note: Except for PWS SCAN and WXR OFF, the active detection modes are displayed:

  - *In cyan if manual mode is selected*
  - *In green if automatic mode is selected*

- 3rd row: Tilt Angle
  The multiscan function of the weather radar alternatively scans at low and high beam, and automatically sets the tilt of these beams to optimize the weather radar detection. The displayed weather radar picture is the result of the storing and merging of the information from each beam.
  The tilt angle is the angle between the horizon and the radar beam axis. The value of the tilt angle is in degrees, and quarters of a degree. It is displayed:
  - In green, when the MULTISCAN sw is set to AUTO. This value represents the average of the lower and the upper beam tilts
  - In cyan, next to the MAN indication, when the flight crew sets the MULTISCAN sw to MAN.

  When the multiscan function is lost, the tilt value is dashed and the NO AUTO TILT message appears on the ND, until the flight crew sets the MULTISCAN sw to MAN.
- 4th row: Failure Messages
  The ND lists the detected failures.
  If the message is in red, the ND does not display the radar image.
  If the message is in amber, the image is not affected.

NO WXR	:	Radar display failure
WXR RT	:	Radar transceiver failure
WXR ANT	:	Radar antenna failure.
WXR CTL	:	Radar control unit failure.
WXR RNG	:	Range error.
WXR DU	:	Overheating of the display unit.
WXR WEAK	:	Calibration failure.
WXR ATT	:	Attitude control failure.
WXR STAB	:	Antenna stabilization failure.
PRED W/S	:	PWS function ◁ failure.
NO AUTO TILT	:	Automatic tilt adjustment failure.
WXR TEST	:	Radar System test.

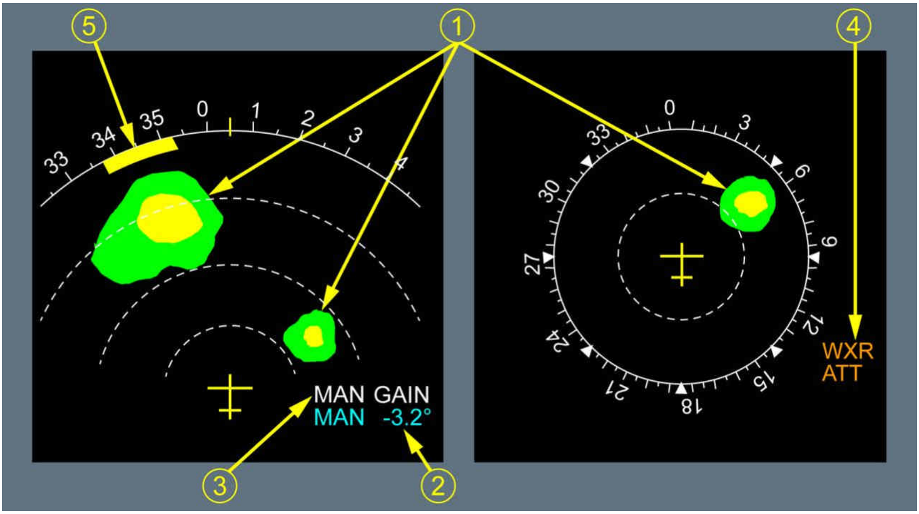
(3) PAC Alert

When the flight crew sets the display mode selector to WX or WX+T, or WX+T+HZD ◁ and sets the gain to CAL, and when the aircraft is within 80 NM of a storm cell, the PAC alert is available.
The PAC alert displays a yellow arc on the outermost scale of the ND, when an intervening rainfall creates an attenuated area behind a storm cell (also called a radar shadow or attenuation effect).

Note: *The PAC alert is available regardless of the position of the MULTISCAN sw (e.g. MAN or AUTO).*

WEATHER RADAR INDICATION ON ND

Ident.: DSC-34-20-30-30-00000745.0006001 / 03 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO



(1) Weather Radar Picture

- When the radar is operating, and when the ND is not in PLAN mode, the ND displays the weather radar picture.
- The weather echoes appear in different colors, depending on the precipitation rates (black, green, yellow, red or magenta for turbulence).
- The selected ND range will determine how often the image is refreshed.

(2) Tilt Angle

- The multiscan function of the weather radar alternatively scans at low and high beam, and automatically sets the tilt of these beams to optimize the weather radar detection. The displayed weather radar picture is the result of the storing and merging of the information from each beam.
- The value of the tilt angle is in degrees, and quarters of a degree. It appears in the lower right corner of the screen:
  - In green, when the MULTISCAN sw is set to AUTO. This value represents the average of the lower and the upper beam tilts.
  - In blue, next to the MAN indication, when the flight crew sets the MULTISCAN sw to MAN.

  The tilt angle is the angle between the horizon and the radar beam axis.
- When the multiscan function is lost, the tilt value is dashed and the NO AUTO TILT message appears on the ND, until the flight crew sets MULTISCAN sw to MAN.

(3) Gain Mode

- MAN GAIN appears, when the flight crew selects the manual gain mode.

(4) Failure Messages

The ND lists the detected failures.
If the message is in red, the ND does not display a radar image.
If the message is in amber, the image is not affected.

NO WXR : Radar System failure.
WXR RT : Radar transceiver failure.
WXR ANT : Radar antenna failure.
WXR CTL : Radar control unit failure.
WXR RNG : Range error.
WXR DU : Overheating of the display unit.
WXR WEAK : Calibration failure.
WXR ATT : Attitude control failure.
WXR STAB : Antenna stabilization failure.
PRED W/S : PWS function ◁ failure.
NO AUTO TILT : Automatic tilt adjustment failure.
WXR TEST : Radar System test.

(5) PAC alert

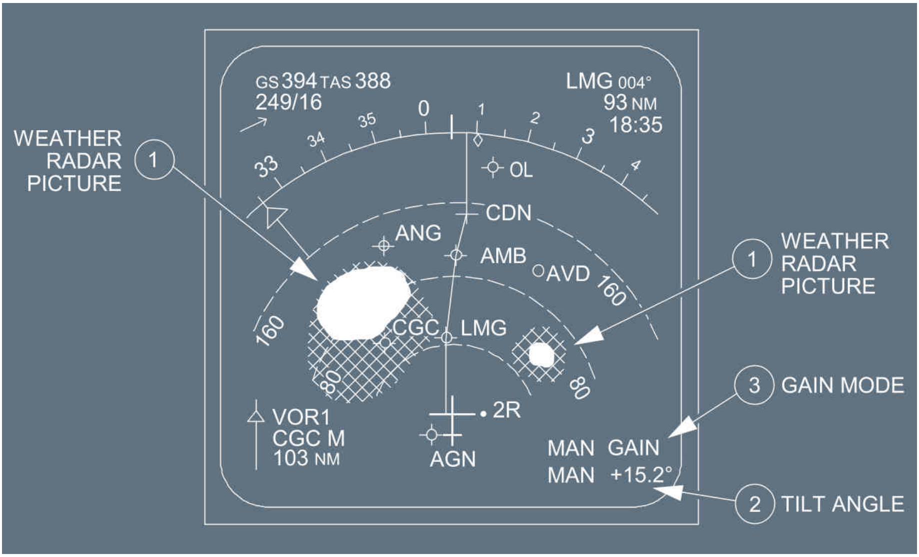
When the flight crew sets the display mode selector to WX or WX+T, or WX+T+HZD ◁ and sets the gain to CAL, and when the aircraft is within 80 NM of a storm cell, the PAC alert is available.

The PAC alert displays a yellow arc on the outermost scale of the ND, when an intervening rainfall creates an attenuated area behind a storm cell (also called a radar shadow or attenuation effect).

Note: *The PAC alert is available regardless of the position of the MULTISCAN sw (e.g. MAN or AUTO).*

WEATHER RADAR INDICATION ON ND

Ident.: DSC-34-20-30-30-00000745.0004001 / 02 SEP 14
Applicable to: LV-KHT, LV-KHU


WEATHER RADAR PICTURE
1
GS 394 TAS 388
249/16
LMG 004°
93 NM
18:35
0
1
2
3
4
33
34
35
OL
CDN
ANG
AMB
AVD
160
160
CGC
LMG
80
80
VOR1
CGC M
103 NM
2R
AGN
MAN GAIN
MAN +15.2°
1
WEATHER RADAR PICTURE
3
GAIN MODE
2
TILT ANGLE

(1) Weather Radar Picture

- When the radar is operating, and when the ND is not in PLAN mode, the ND displays the weather radar picture.
- The echoes appear in different colors, depending on the precipitation rates (black, green, yellow, red or magenta).
- The selected ND range will determine how often the image is refreshed.

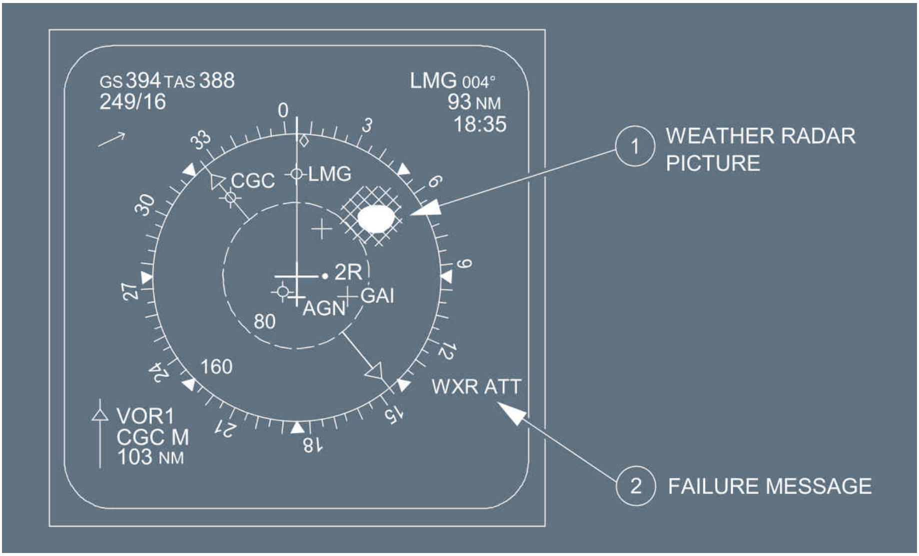
(2) Tilt Angle

- The auto-tilt function of the weather radar automatically sets the tilt angle to optimize weather radar detection.
- The value of the tilt angle is in degrees, and quarters of a degree. It appears in the lower right corner of the screen:
  - In green, when the flight crew sets the TILT sw to AUTO
  - In blue, next to the blue “MAN” indication, when the flight crew sets the TILT sw to MAN.

  The tilt angle is the angle between the horizon and the radar beam axis.
- When the auto-tilt function is lost, the tilt value is dashed, the “NO AUTO TILT” message appears in amber on the ND, until the flight crew sets the TILT sw to MAN.

(3) Gain Mode

- ”MAN GAIN” appears in white, when the flight crew selects the manual gain mode.


GS 394 TAS 388
249/16
LMG 004°
93 NM
18:35
0
3
6
9
12
15
18
21
24
27
30
33
CGC
LMG
2R
AGN
GAI
80
160
WXR ATT
VOR1
CGC M
103 NM
1
WEATHER RADAR PICTURE
2
FAILURE MESSAGE

(1) Weather Radar Picture

- When the radar is operating, and when the ND is not in PLAN mode, the ND displays the weather radar picture.
- The echoes appear in different colors, depending on the precipitation rates (black, green, yellow, red or magenta).
- The selected ND range will determine how often the image is refreshed.

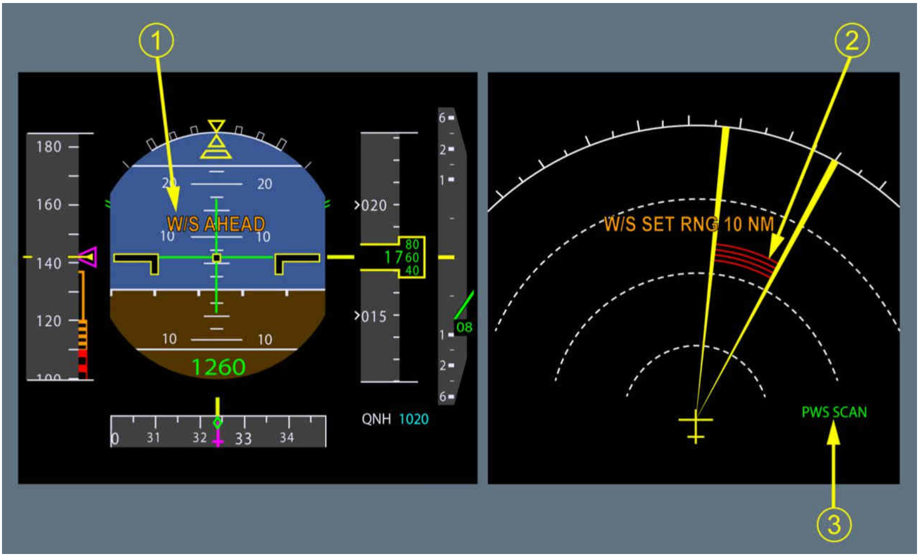
(2) Failure Messages

The ND lists the detected failures.
If the message is in “red”, the ND does not display a radar image.
If the message is in “amber”, the image is not affected.

WXR R/T (red) : Radar transceiver failure.
WXR ANT (red) : Radar antenna failure.
WXR DU (red) : Overheating of the display unit
WXR CTL (red) : Radar control unit failure.
WXR RNG (red) : Range error.
WXR WEAK (amber) : Calibration failure.
WXR ATT (amber) : Attitude control failure.
WXR STAB (amber) : Antenna stabilization failure.

PWS ⋘ INDICATION ON PFD AND ND

Ident.: DSC-34-20-30-30-00020809.0002001 / 01 MAR 18
Applicable to: ALL



(1) W/S AHEAD message on the PFD
This message is displayed, when the Predictive WindShear system detects windshear ahead of the aircraft..
The message is in amber or red, depending on the level of the alert.

(2) Predictive WindShear area indication
A red and black symbol and two yellow radial lines indicate the predicted windshear area.
Windshear indication is available in ARC and ROSE ND modes.
When the radar detects a windshear event and the ND range is set above 10 NM, a W/S SET RNG 10 NM (Windshear, set range to 10 NM) message appears. This message requests the flight crew to adjust the range on the corresponding ND.
Depending on the windshear alert level, ND indication may be associated with an aural message and a PFD message.

(3) PWS SCAN message on the ND

If only the PWS detection is active, the ND displays a PWS SCAN message when the PWS is active. In this mode, when the radar detects a windshear event, a windshear symbol and the weather returns appear automatically on the ND.

MEMO DISPLAY

Ident.: DSC-34-20-30-30-00017202.0001001 / 21 MAR 16
Applicable to: ALL

The "PRED W/S OFF" message appears when the windshear is set to OFF on the weather radar panel.

PRED W/S OFF	:	This memo appears in green during flight phases 2 and 6.
PRED W/S OFF	:	This memo appears in amber when: - The aircraft is in flight phases 3, 4, 5, 7, 8, and 9. - The T.O. CONFIG pb is pressed during flight phase 2.

OVERVIEW

Ident.: DSC-34-20-40-10-00021038.0001001 / 17 MAR 17
Applicable to: ALL

The purpose of the Ground Proximity Warning System (GPWS) is to warn the flight crew of potentially hazardous situations, such as a collision with terrain. It detects terrain collision threats and triggers applicable aural and visual indications.

The GPWS includes:

- Five basic modes active up to radio height of 2 500 ft:
  - Excessive rate of descent (Mode 1)
  - Excessive terrain closure rate (Mode 2)
  - Altitude loss after takeoff or go-around (Mode 3)
  - Terrain clearance not sufficient, if not in landing configuration (Mode 4)
  - Excessive descent below the glide slope (Mode 5).
- A predictive GPWS function, based on a GPWS database, to display terrain information. It can be provided:
  - By Honeywell through Enhanced GPWS (EGPWS)
  - By ACSS as Ground Collision Avoidance System (GCAS), through T2CAS or T3CAS.

  The predictive GPWS is composed of:

  - Mandatory functions such as the Forward Looking Terrain Alerting function
  - Optional functions such as the obstacle database.

  Note: *The terrain data are displayed on the ND and the brightness is controlled via the weather radar brightness control knob. If the weather radar brightness was set to low (due to bad weather) and a terrain alert occurs, then the brightness of the terrain display will also be low.*

PRINCIPLE

Ident.: DSC-34-20-40-10-00021039.0001001 / 17 MAR 17
Applicable to: ALL

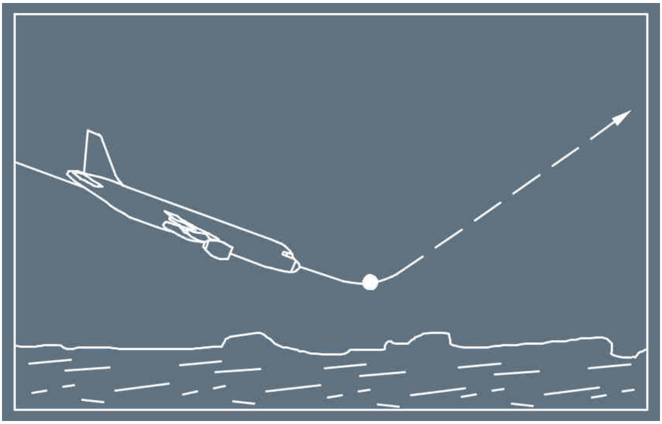
The GPWS computes the geometric altitude of the aircraft by using:

- Pressure altitude
- Radio-altitude
- Temperature
- Barometric references

- GPS altitude for predictive GPWS ◁
- Data from the GPWS database for predictive GPWS ◁ .

MODE 1 : EXCESSIVE RATE OF DESCENT

Ident.: DSC-34-20-40-20-00014903.0004001 / 19 MAY 14
Applicable to: ALL

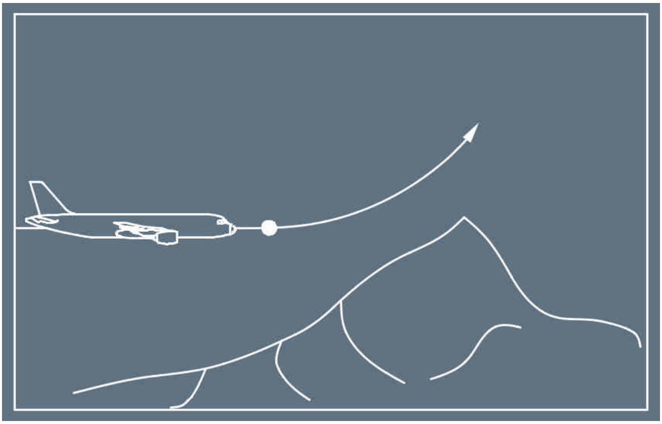


Mode 1 triggers aural and visual alerts about excessive rates of descent, based on the radio height, and the rate of descent of the aircraft.
Mode 1 is active for all phases of the flight.

	CAUTION		WARNING	
AURAL ALERT	"SINK RATE, SINK RATE"		"PULL UP" (repeated as long as MODE 1 is triggered)	
VISUAL ALERT	GPWS	The GPWS amber lights come on	PULL UP	The PULL UP red lights come on

MODE 2 : EXCESSIVE TERRAIN CLOSURE RATE

Ident.: DSC-34-20-40-20-00014904.0004001 / 03 AUG 17
Applicable to: ALL



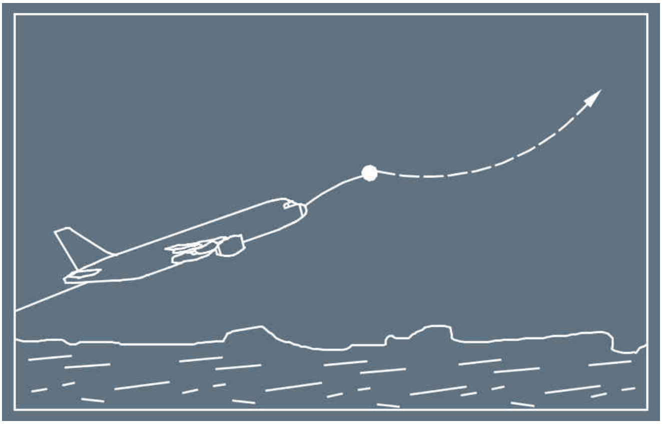
Mode 2 triggers aural and visual alerts, based on the landing gear/flaps configuration of the aircraft, the radio height, and the RA rate of change.
There are two types of Mode 2 alerts, Mode 2A (active during climb, cruise, and initial approach), and Mode 2B (active during approach and 60 s after takeoff).

CONFIGURATION	**Flaps not in Landing position + Landing Gear Up (Mode 2A)** **Flaps in landing position + Landing Gear Up (Mode 2B)**					
	CAUTION		**WARNING**			
AURAL ALERT	"TERRAIN, TERRAIN"		"PULL UP" (repeated as long as MODE 2 is triggered in the warning conditions)		"TERRAIN" (repeated as long as MODE 2 is triggered after leaving the warning conditions)	
VISUAL ALERT	GPWS	The GPWS amber lights come on	PULL UP	The PULL UP red lights come on	PULL UP	The PULL UP red lights stay on

CONFIGURATION	**Flaps in landing position + Landing Gear Down (Mode 2B)**
AURAL ALERT	**CAUTION** "TERRAIN" (repeated as long as MODE 2 is triggered)
VISUAL ALERT	GPWS The GPWS amber lights come on

MODE 3 : ALTITUDE LOSS AFTER TAKEOFF

Ident.: DSC-34-20-40-20-00014905.0004001 / 20 SEP 13
Applicable to: ALL

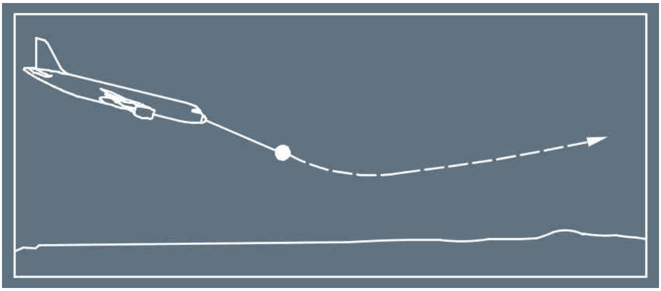


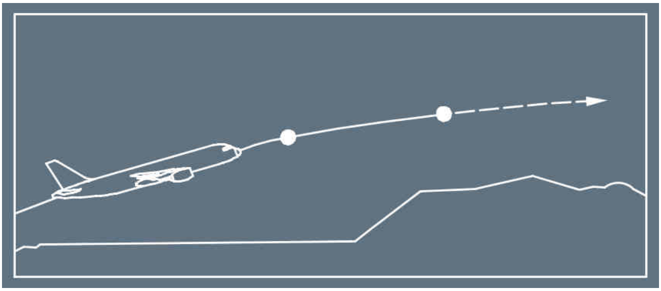
Mode 3 triggers aural and visual alerts when the altitude significantly decreases after takeoff, and go-arounds with landing gear or flaps not in landing configuration.

	CAUTION
AURAL ALERT	"DON'T SINK, DON'T SINK" (repeated as long as MODE 3 is triggered)
VISUAL ALERT	GPWS The GPWS amber lights come on

MODE 4 : UNSAFE TERRAIN CLEARANCE WHEN NOT IN LANDING CONFIGURATION

Ident.: DSC-34-20-40-20-00014906.0003001 / 13 JAN 14
Applicable to: ALL





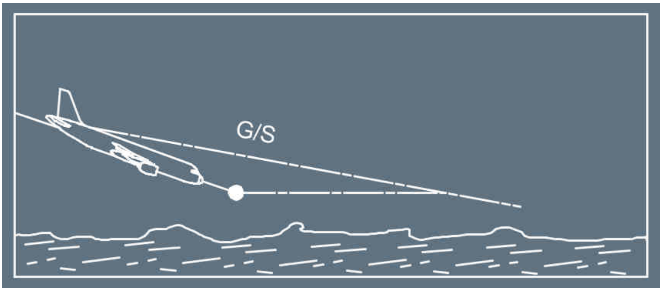
There are three types of Mode 4 alerts, Mode 4A and Mode 4B (both active during cruise and approach), and Mode 4C (active during takeoff*).
Mode 4A and Mode 4B trigger aural and visual alerts when terrain clearance is not sufficient based on the phase of flight, the configuration of the landing gear and the flaps, and the speed. Mode 4C triggers aural and visual alerts based on the minimum terrain clearance and the radio height of the aircraft. *(Only EGPWS not T2CAS)

<table>
<tr><th>CONFIGURATION</th><th colspan="2">Landing gear Up (Mode 4A)</th><th colspan="2">Flaps not in landing position + Landing gear down (Mode 4B)</th><th>Flaps not in landing position OR Landing Gear Up (Mode 4C)</th></tr>
<tr><td rowspan="2">AURAL ALERT</td><td colspan="5">CAUTION</td></tr>
<tr><td>"TOO LOW TERRAIN"</td><td>"TOO LOW GEAR"</td><td>"TOO LOW TERRAIN"</td><td>"TOO LOW FLAPS"</td><td>"TOO LOW TERRAIN"</td></tr>
<tr><td>VISUAL ALERT</td><td colspan="5">GPWS
The GPWS amber lights come on</td></tr>
</table>

MODE 5 : DESCENT BELOW GLIDESLOPE

Ident.: DSC-34-20-40-20-00014907.0004001 / 20 SEP 13

Applicable to: ALL



Mode 5 triggers aural and visual alerts, when the aircraft descends below the glide slope.

	CAUTION
AURAL ALERT	"GLIDESLOPE" (repeated as long as MODE 5 is triggered)
VISUAL ALERT	GPWS The GPWS amber lights come on

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TERRAIN AWARENESS AND DISPLAY

Ident.: DSC-34-20-40-30-00001218.0010001 / 31 MAR 11
Applicable to: ALL

The Terrain Awareness and Display (TAD) function computes a caution and a warning envelope ahead of the aircraft, depending on the aircraft altitude, the nearest runway altitude, the range to the nearest runway threshold, the ground speed, and the turn rate. When the boundary of these envelopes conflicts with the terrain, or with an obstacle memorized in the database, the system generates the relevant alert:

Alert Level	Aural Warning	ND	Local Warning
Warning	TERRAIN AHEAD, PULL UP	- Automatic terrain display (1) - Solid red areas - TERR AHEAD (red)	On each pilot's instrument panel, the PULL UP (red) light comes on.
	OBSTACLE AHEAD PULL UP	- Automatic terrain display (1) - Solid red areas - OBST AHEAD (red)	
Caution	TERRAIN AHEAD	- Automatic terrain display (1) - Solid yellow areas - TERR AHEAD (amber)	On each pilot's instrument panel, the GPWS (amber) light comes on
	OBSTACLE AHEAD	- Automatic terrain display (1) - Solid yellow areas - OBST AHEAD (amber)	

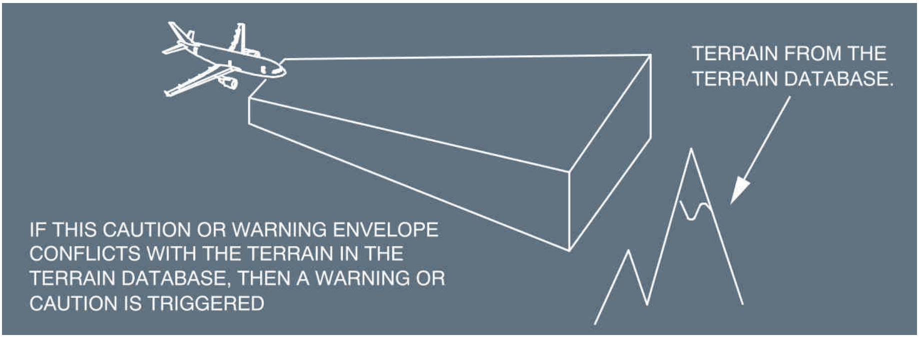
(1) *When the TERR ON ND pb is set to ON, and ARC or ROSE mode is selected, the ND displays the terrain and the obstacles memorized in the database, depending on the aircraft's position. The terrain is displayed in various densities of green, yellow, red or magenta depending on the threat (Refer to DSC-31-45 General: INDICATIONS ON ND). If an alert is generated (caution or warning) and TERR ON ND is not selected, the terrain is automatically displayed, and the ON light of the TERR ON ND pb comes on.*

Note: *1. When TERR ON ND is selected, the weather radar display image is not displayed.*
2. The Geometric Altitude function can protect against certain BARO setting errors, provided the components used to compute the Geometric Altitude are valid and accurate enough.
3. The TAD and Terrain Clearance Floor (TCF) functions operate using the pure lateral GPS position and, the FMS 1 position as backup.

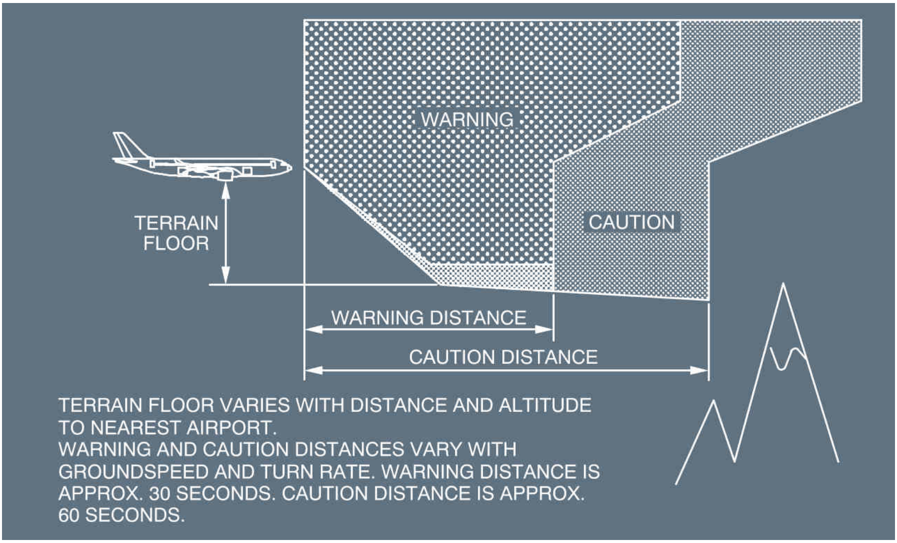
In case of low accuracy of the aircraft position computed by the EGPWS, the enhanced modes of the EGPWS are automatically deactivated. The five GPWS modes remain active.

TERRAIN CAUTION AND WARNING ENVELOPE BOUNDARIES

Ident.: DSC-34-20-40-30-00005063.0002001 / 01 OCT 12
Applicable to: ALL

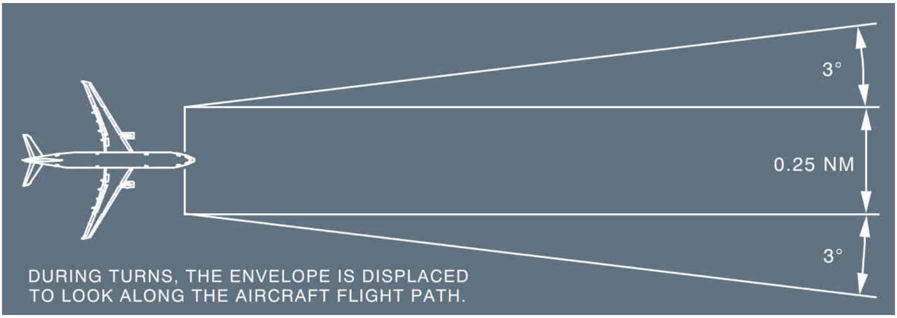

TERRAIN FROM THE TERRAIN DATABASE.
IF THIS CAUTION OR WARNING ENVELOPE CONFLICTS WITH THE TERRAIN IN THE TERRAIN DATABASE, THEN A WARNING OR CAUTION IS TRIGGERED

VERTICAL ENVELOPE


WARNING
CAUTION
TERRAIN FLOOR
WARNING DISTANCE
CAUTION DISTANCE

TERRAIN FLOOR VARIES WITH DISTANCE AND ALTITUDE TO NEAREST AIRPORT.
WARNING AND CAUTION DISTANCES VARY WITH GROUNDSPEED AND TURN RATE. WARNING DISTANCE IS APPROX. 30 SECONDS. CAUTION DISTANCE IS APPROX. 60 SECONDS.

HORIZONTAL ENVELOPE



DURING TURNS, THE ENVELOPE IS DISPLACED TO LOOK ALONG THE AIRCRAFT FLIGHT PATH.

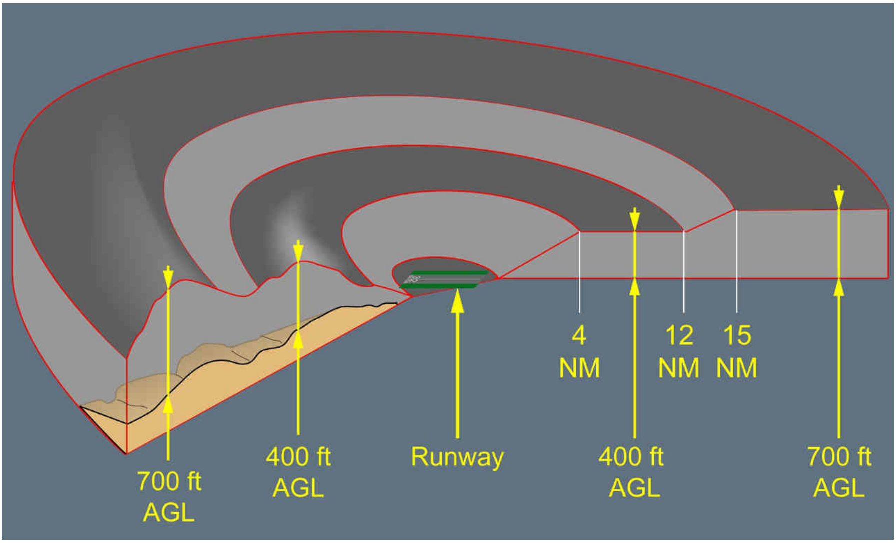
TERRAIN CLEARANCE FLOOR

Ident.: DSC-34-20-40-30-00005064.0002001 / 03 NOV 23
Applicable to: ALL

TERRAIN CLEARANCE FLOOR (TCF)

The TCF function computes a terrain clearance envelope around the airport runway. This function triggers an alert if the terrain clearance is not sufficient (even when the aircraft is in landing configuration). This function provides an enhanced GPWS mode 4.
The TCF function also protects against an attempt to land where there is no airfield.
The TAWS database includes the applicable TCF envelope for each airport runway that has terrain data, and that is longer than 3 500 ft.
The TCF function is active during all the following flight phases: Takeoff, cruise and approach.

TCF Envelope



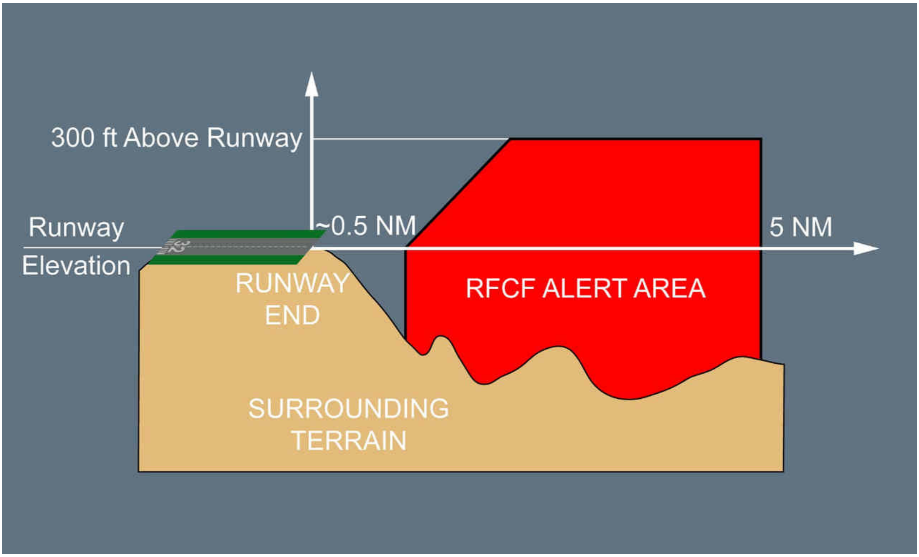
If the aircraft descends below the protection envelope, both of the following alerts are triggered:
- The "TOO LOW TERRAIN" aural alert, if the aircraft enters the envelope
  L2 If the aircraft continues to descend below the envelope, the alert is triggered one time for every 20 % degradation in radio altitude
- L1 The GPWS light of the GPWS pb-sw on each instrument panel comes on (*Refer to DSC-34-20-40-40 Main Instruments Panel*).

RUNWAY FIELD CLEARANCE FLOOR

Ident.: DSC-34-20-40-30-00005065.0002001 / 28 MAY 20
Applicable to: ALL

The Runway Field Clearance Floor (RFCF) function provides an additional protection envelope for runways that are at an elevation that is significantly more than the surrounding terrain.
The envelope is a circular band that starts within a specific distance of the runway. The width of this circular band depends on the runway. The envelope is based on both the geometric altitude and the runway elevation.
If the aircraft descends below this protection envelope, the "TOO LOW TERRAIN" aural and visual alerts are triggered.

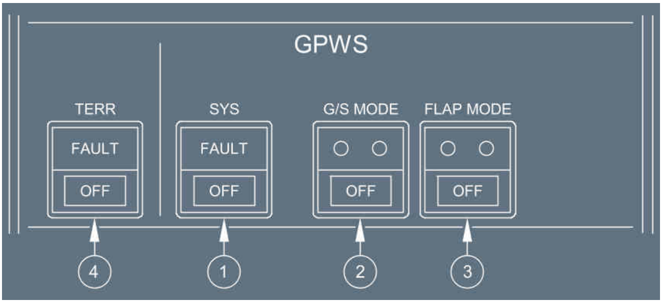
RFCF


300 ft Above Runway
Runway
Elevation
~0.5 NM
5 NM
RUNWAY
END
RFCF ALERT AREA
SURROUNDING
TERRAIN

Intentionally left blank

OVERHEAD PANEL

Ident.: DSC-34-20-40-40-00001220.0005001 / 04 DEC 18
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO



(1) SYS pushbutton

OFF : All basic GPWS alerts (Mode 1 to 5) are inhibited.

FAULT lt : This amber light comes on, along with an ECAM caution, if the GPWS mode 1 to 5 malfunctions.

Note: *If ILS 1 fails, only mode 5 is inhibited. Consequently, the FAULT light does not come on, and the GPWS FAULT warning is not triggered.*

(2) G/S MODE pushbutton

OFF : Glide slope mode (mode 5) is inhibited.

(3) FLAP MODE pushbutton

OFF : Flap mode ("TOO LOW FLAPS" mode 4) is inhibited.
(To avoid nuisance warning in case of landing with reduced flaps setting).

Note: *If LDG CONF 3 is selected on MCDU, the flap mode will be automatically inhibited when FLAPS 3 position is reached.*

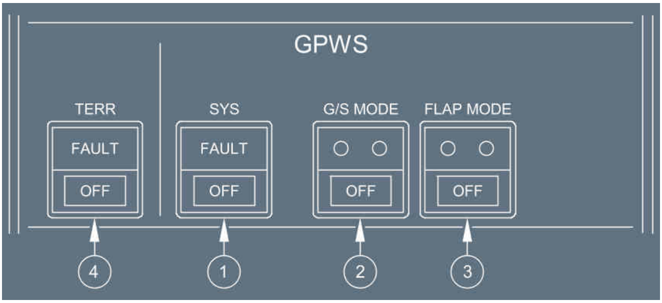
(4) TERR pushbutton

OFF : Inhibits the Terrain Awareness Display (TAD) and Terrain Clearance Floor (TCF) modes, and does not affect the basic GPWS mode 1 to 5. Also inhibits the ROW/ROP function.

FAULT lt : This amber light comes on, along with an ECAM caution, if the TAD or TCF mode fails. The basic GPWS mode 1 to mode 5 are still operative, if the SYS pushbutton switch lights OFF or FAULT are not illuminated.

OVERHEAD PANEL

Ident.: DSC-34-20-40-40-00001220.0002001 / 04 DEC 18
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KHT, LV-KHU



(1) SYS pushbutton

OFF : All basic GPWS alerts (Mode 1 to 5) are inhibited.

FAULT lt : This amber light comes on, along with an ECAM caution, if the GPWS mode 1 to 5 malfunctions.

Note: If ILS 1 fails, only mode 5 is inhibited. Consequently, the FAULT light does not come on, and the GPWS FAULT warning is not triggered.

(2) G/S MODE pushbutton

OFF : Glide slope mode (mode 5) is inhibited.

(3) FLAP MODE pushbutton

OFF : Flap mode ("TOO LOW FLAPS" mode 4) is inhibited.
(To avoid nuisance warning in case of landing with reduced flaps setting).

Note: If LDG CONF 3 is selected on MCDU, the flap mode will be automatically inhibited when FLAPS 3 position is reached.

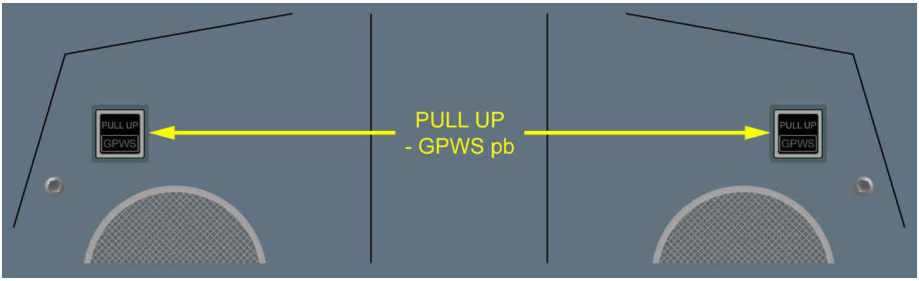
(4) TERR pushbutton

OFF : Inhibits the Terrain Awareness Display (TAD) and Terrain Clearance Floor (TCF) modes, and does not affect the basic GPWS mode 1 to 5.

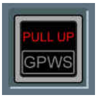
FAULT lt : This amber light comes on, along with an ECAM caution, if the TAD or TCF mode fails. The basic GPWS mode 1 to mode 5 are still operative, if the SYS pushbutton switch lights OFF or FAULT are not illuminated.

MAIN INSTRUMENTS PANEL

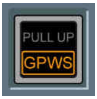
Ident.: DSC-34-20-40-40-00001222.0012001 / 28 MAY 20
Applicable to: ALL



PULL UP – GPWS pb

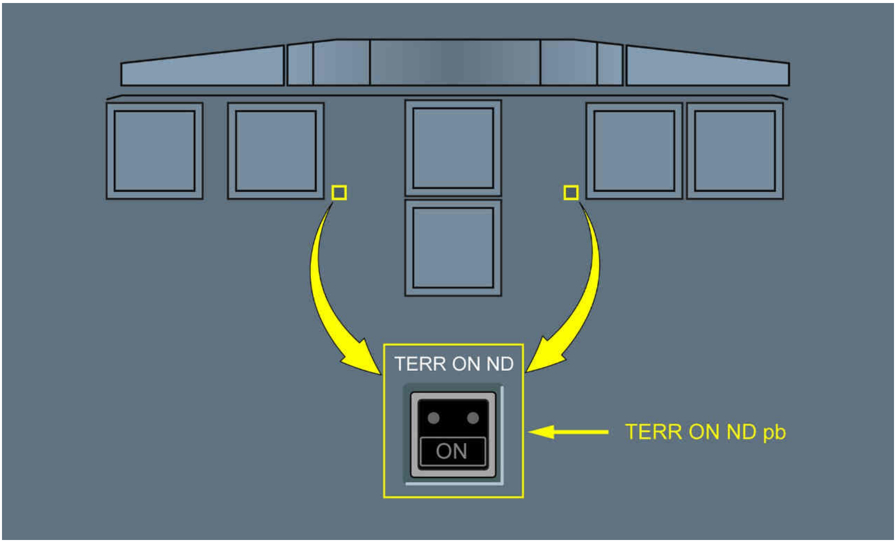


Comes on to give a visual indication when a PULL UP warning alert is triggered in modes 1, 2, and TAD. The corresponding aural alert sounds.



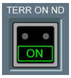
Comes on when any other mode is activated.
The corresponding aural alert sounds.

Note:
1. *If the flight crew briefly presses the PULL UP – GPWS pb when the GPWS light is on, following a mode 5 GLIDE SLOPE alert, the GPWS light goes off and the aural alert stops.*
2. *On the ground, to test the GPWS, the flight crew press the PULL UP – GPWS pb. If the flight crew briefly presses this pb, some of the aural alerts sound and the pb captions, associated with the GPWS come on. If the flight crew continuously presses this pb, all the aural alerts sound.*


TERR ON ND
ON
TERR ON ND pb

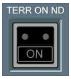
TERR ON ND pb

These pbs are on both sides of the ECAM. Each pb controls the onside terrain display.


TERR ON ND
ON

The terrain appears on the ND if both of the following apply:
- TERR ON ND pb is set to ON
- TERR FAULT light is not on.

The ON light comes on.


TERR ON ND
ON

The terrain data does not appear on the ND.

Note:

1. *If the TAD mode generates a caution or a warning while the TERR ON ND pb is off, the terrain automatically appears on the NDs. In addition, the ON light of the TERR ON ND pb will come on.*
2. *To be able to identify the difference between the terrain and the weather display, the terrain display goes from the center outward to both sides of the ND.*
3. *The terrain and obstacles image appears on the ND if:*
   - *The aircraft is within 2 000 ft above the terrain, and*
   - *The TERR ON ND pb is pressed, or automatically, in the case of terrain caution(warning) alerts.*

   Depending on the capacity of the TAWS system installed (e.g. with Eleview or Peaks functions), the terrain can display the highest and lowest geographic terrain elevations for the selected ND range. The terrain can also increase situation awareness, regardless of the aircraft altitude.

   If the terrain(obstacle) image is automatically displayed on the ND, if the flight crew presses the TERR ON ND pb, the terrain(obstacle) image no longer appears.

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-34-20-40-40-A-00017204.0001001 / 21 MAR 16

GPWS FLP OFF : This memo appears in green when the GPWS FLAP MODE pb-sw is OFF.

Ident.: DSC-34-20-40-40-A-00017205.0002001 / 21 MAR 16

The "TERR OFF" message appears when the EGPWS is voluntarily deselected.

TERR OFF : This memo appears in green during flight phases 2 and 6.

TERR OFF : This memo appears in amber when:

- The aircraft is in flight phases 3, 4, 5, 7, 8, and 9.
- The T.O. CONFIG pbis pressed during flight phase 2.

Ident.: DSC-34-20-40-40-A-00017208.0004001 / 21 MAR 16

TERR STBY : In flight, the TERR STBY memo appears in green when the aircraft position accuracy (computed by the EGPWS) is insufficient to allow the enhanced TCF and TAD modes to operate. These modes are not available until the TERR STBY memo disappears. If selected, the terrain data display on the ND is automatically deselected when the TERR STBY memo is triggered.

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GENERAL

Ident.: DSC-34-20-50-10-00016110.0001001 / 23 JUN 15
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The Runway Overrun Prevention System (ROPS) is designed to alert the flight crew in the case of potential runway overrun situation for dry and wet runway. The ROPS is composed of two functions:
- The Runway Overrun Warning (ROW) function. It automatically arms at 500 ft AGL and works until start of braking,
- The Runway Overrun Protection (ROP) function. It works from start of braking until the aircraft stops.

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DESCRIPTION

Ident.: DSC-34-20-50-20-00016112.0004001 / 03 NOV 22
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The ROW/ROP functions compute both the wet and dry landing distances for the current conditions. The system then compares these values with the LDA of the landing runway. To detect the landing runway, the ROW/ROP functions use the TAWS runway database and the current aircraft position and track. During final approach:

- The detection starts from 2 000 ft, then
- The ROW function arms at 500 ft.

L2 The landing runway detection is continuously updated several times per second, including below 500 ft when the ROW function is armed.

L1 The computation occurs in real time, the ROW and ROP functions consider:
- All landing weight and CG ranges (this includes overweight landing)
- Both landing configurations (CONF 3 and CONF FULL)
- LDA
- All wind conditions
- Dry and wet runway conditions
- No failure that affects landing performance
- 15 % safety margin.

If a risk of overrun is detected (computed landing distances are more than the LDA) the ROW/ROP triggers:
- Visual alert messages displayed on the PFDs
- Aural alert messages provided through loudspeakers.

ROW FUNCTION

The ROW function provides enhanced flight crew awareness about the approach stabilization and the capability to land on available landing distance.

ROW ARMING

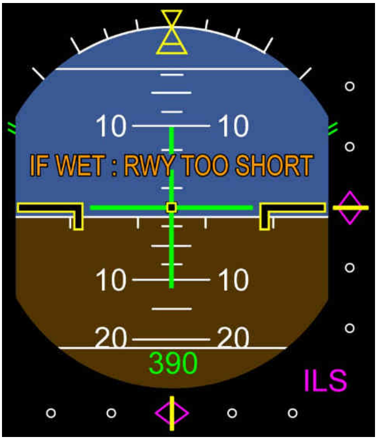
During the approach, the ROW function detects the landing runway according to the aircraft position, and the TAWS runway database.
At 500 ft AGL, the ROW function automatically arms, and starts to compute both the wet and dry landing distances for current aircraft and environmental conditions.

The ROW function computes the landing distance with the following assumptions:
- Maximum manual brake pressure
- Idle reverser thrust for the computation for dry runway
- Maximum reverser thrust for the computation for wet runway.

ROW ACTIVATION

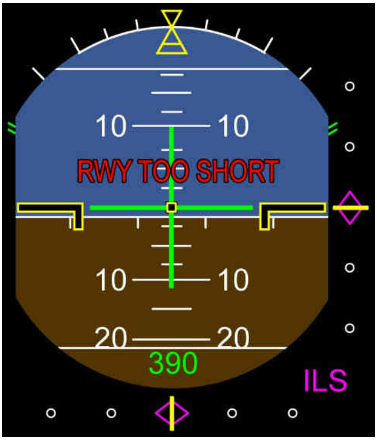
Below 400 ft, if the computation for wet landing distance is more than the LDA:

- The IF WET: RWY TOO SHORT message is displayed on both PFDs. This message flashes for 9 s and then remains steady. This message is not associated with an aural alert.



Below 400 ft, if the computation for dry landing distance is more than the LDA:

- The RWY TOO SHORT message is displayed on both PFDs. This message flashes for 9 s and then remains steady. In addition, when reaching 200 ft , a repetitive aural alert “RUNWAY TOO SHORT" triggers.



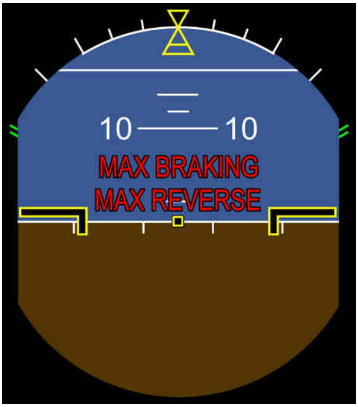
When the landing distance computation is less than the LDA, the alerts stop.

ROP FUNCTION

The ROP function provides enhanced flight crew awareness about the deceleration and capability to stop before the end of the runway.

ROP ACTIVATION

On ground, the ROP function computes the braking distance for the current aircraft and runway conditions. If current braking performance is not sufficient to stop on LDA, it triggers visual and aural alerts.
As soon as an overrun situation is detected MAX BRAKING and MAX REVERSE messages are displayed on both PFDs. They flash for 9 s and then remain steady.



At the same time, the aural alert “BRAKE, MAX BRAKING, MAX BRAKING” is triggered and continues until the system detects maximum manual brake pressure.
When the flight crew applies maximum manual brake pressure, the aural alert “SET MAX REVERSE” is triggered and continues until the system detects maximum reverse thrust.

Note: *The aural alert “BRAKE, MAX BRAKING, MAX BRAKING" has priority over “SET MAX REVERSE".*

Below 80 kt, the aural alert “KEEP MAX REVERSE” is triggered, if the system still detects overrun situation with maximum manual brake pressure and maximum reverse thrust.
If the overrun situation is no longer detected, alerts are no longer triggered.

ROP INHIBITION

The ROP function is inhibited when the ground speed decreases below 30 kt.

OPERATING PROCEDURES

For operating procedure related to ROW/ROP (*Refer to FCTM/AS-ROWROP General*).

CONTROLS AND INDICATORS

Ident.: DSC-34-20-50-30-00016113.0001001 / 03 MAY 23
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

For ROW/ROP control, *Refer to DSC-34-20-40-40 Overhead Panel*.

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OVERVIEW

Ident.: DSC-34-20-60-10-00020237.0001001 / 17 MAR 17
Applicable to: ALL

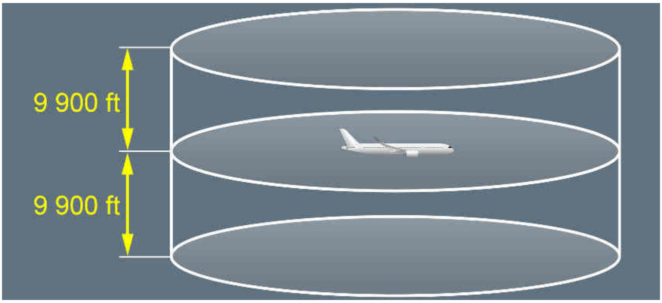
The Traffic Collision Avoidance System (TCAS):
- Detects and displays surrounding aircraft that have a transponder
- Calculates and display possible collision threats
- Triggers vertical speed orders, in order to avoid collisions.

PRINCIPLE

Ident.: DSC-34-20-60-10-00020239.0001001 / 05 JUN 18
Applicable to: ALL

The TCAS detection capability is limited to intruders flying within a maximum range of 30 NM on either sides and approximately 30 NM to 100 NM longitudinally (depending on aircraft configuration and external conditions), and within a maximum altitude range of 9 900 ft above and below the aircraft.

TCAS Range

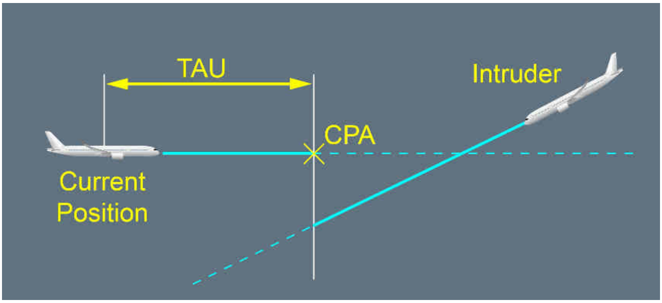


The TCAS obtains data transmitted by the transponders of nearby aircraft, and uses this data to evaluate possible collision threats.

The TCAS determines:
- The bearing of intruders, in relation to the bearing of the aircraft
- The distance between the aircraft and intruders, and the rate of separation or closure
- The relative altitude of intruders, if intruders report their altitude via a Mode-C or Mode-S transponder.

The TCAS then calculates the intruder trajectory, the Closest Point of Approach (CPA), and the estimated time (TAU) before reaching the CPA.
The TAU is the ratio between the distance that separates both aircraft, and the sum of their speed.

TAU Definition



If the TCAS detects that the trajectory of an intruder may be a collision threat, it triggers:

- Audio and visual indicators
- Vertical speed orders, to ensure a sufficient trajectory separation and a minimal vertical speed variation considering all intruders.

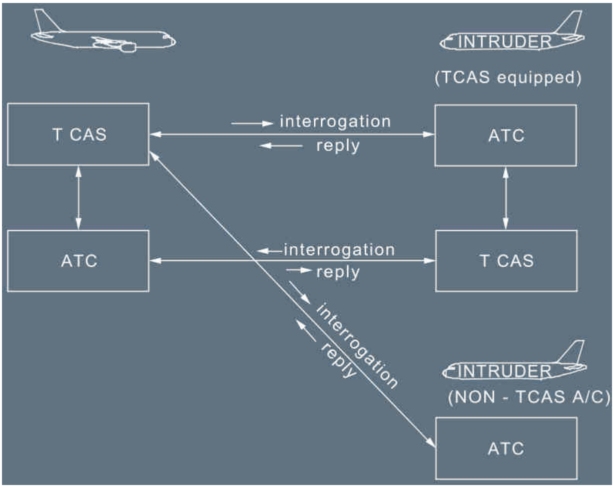
MAIN COMPONENTS

Ident.: DSC-34-20-60-10-00020240.0001001 / 17 MAR 17
Applicable to: ALL

The system includes:

- A single channel TCAS computer
- Two TCAS antennas
- Two mode S ATC transponders, one active the other in standby.

  These transponders allow:
  - Interface between the ATC/TCAS control panel and the TCAS computer
  - Communication between the aircraft and intruders equipped with a TCAS system.
- An ATC/TCAS control panel.

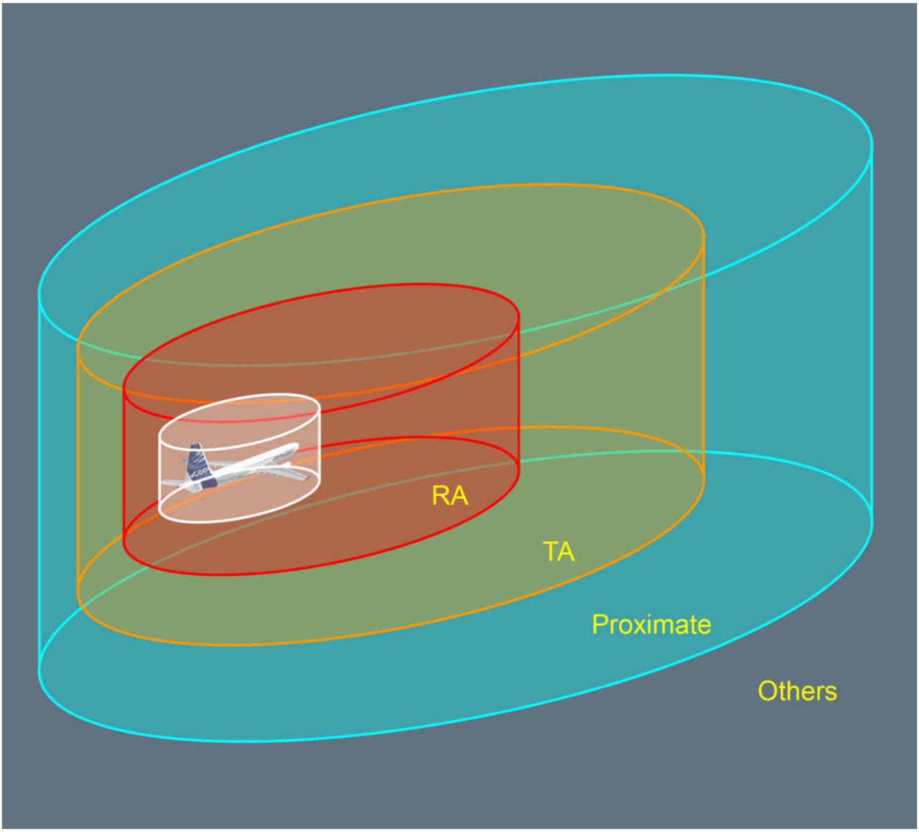

INTRUDER
(TCAS equipped)
T CAS
interrogation
reply
ATC
ATC
interrogation
reply
T CAS
interrogation
reply
INTRUDER
(NON - TCAS A/C)
ATC

INTRUDER DETECTION CATEGORIES

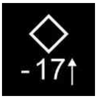
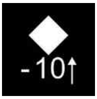
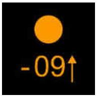
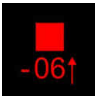
Ident.: DSC-34-20-60-10-00020247.0001001 / 26 NOV 19
Applicable to: ALL

The TCAS divides the space surrounding the aircraft into the following four zones, in order to evaluate and categorize possible collision threats:
- Resolution Advisory (RA)
- Traffic Advisory (TA)
- Proximate intruders
- Other intruders.

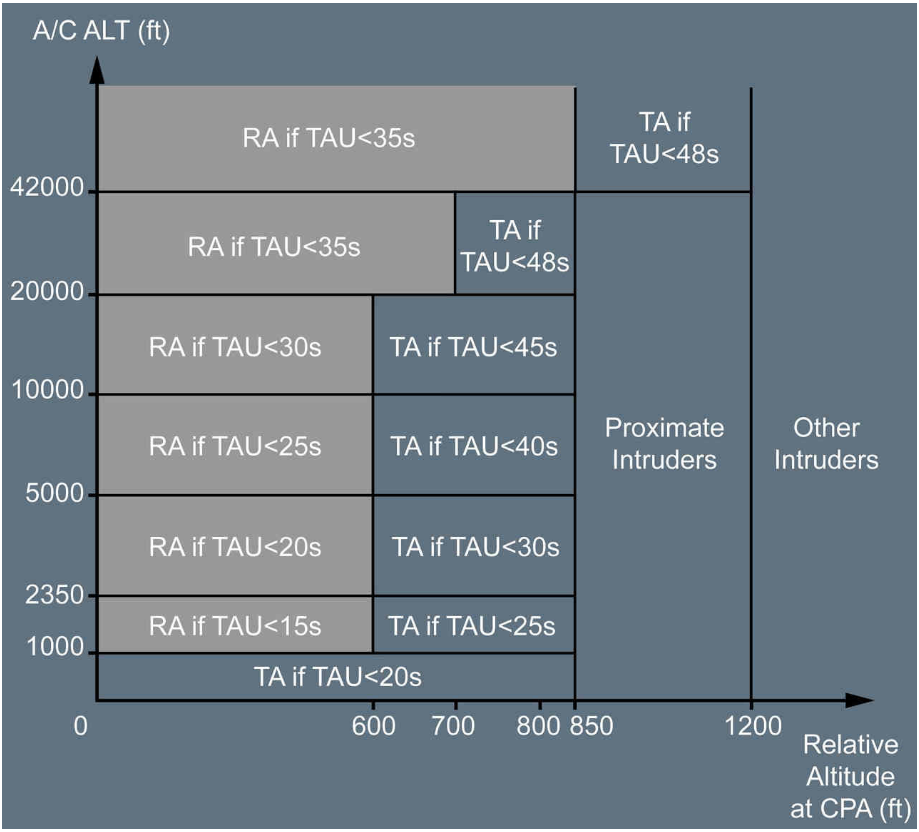
TCAS Envelopes



Depending on the level of the collision threat, the TCAS triggers audio and visual indicators:

LEVEL	INTRUDER POSITION	DISPLAYED INFORMATION AND MESSAGE	
Other intruders	- No collision threat - Any non-proximate, TA, RA within the surveillance envelope (lateral range: Closer than 30 NM)	- ND: Intruder position	
Proximate	- No collision threat - Intruder in the vicinity of the A/C (closer than 6 NM laterally and ±1 200 ft vertically)	- ND: Intruder position	
Traffic Advisory (TA)	- Potential collision threat - TAU is about 40 s	- ND: Intruder position - Aural messages	
Resolution Advisory (RA)	- Real collision threat - TAU is about 25 s	- ND: Intruder position - Aural messages - PFD: Vertical orders • Maintain actual V/S (Preventive Advisory) or • Modify V/S (Corrective Advisory)	

TA/RA thresholds



TCAS MODES

Applicable to: ALL

Ident.: DSC-34-20-60-10-10-00020248.0001001 / 17 MAR 17

TCAS MODES

The TCAS has three different modes of operations that can be selected on the ATC/TCAS control panel:
- The Traffic Advisory/Resolution Advisory (TA/RA) mode
- The Traffic Advisory Only (TA ONLY) mode
- The standby (STBY) mode.

Ident.: DSC-34-20-60-10-10-00020249.0001001 / 17 MAR 17

TRAFFIC ADVISORY/RESOLUTION ADVISORY (TA/RA) MODE

The TA/RA mode is the normal TCAS operating mode that enables:
- The ND to display all intruders
- The PFD to display the vertical speed orders that indicate the vertical direction that the aircraft should take, in order to avoid a collision.

Ident.: DSC-34-20-60-10-10-00020250.0001001 / 17 MAR 17

TRAFFIC ADVISORY ONLY (TA ONLY) MODE

The TA ONLY mode can be selected:
- Manually in case of aircraft degraded performance (engine failure, landing gear extended), or in specific airports, and for specific procedures (identified by operators) that may provide RA that are neither wanted nor appropriate (e.g. closely-spaced parallel or converging runways).
- Automatically, if TA/RA mode is previously selected and:
  - The windshear alert is triggered
  - The stall warning is triggered
  - GPWS alerts are triggered
  - Aircraft is below 1 000 ft AGL.

When the TCAS is operating in TA ONLY mode:
- All RAs are inhibited and converted into TAs (TCAS flight guidance mode is inhibited)
- TA threshold is set to TAU ≤20 s, irrespective of the aircraft’s altitude
- No vertical speed advisories are indicated on the PFDs
- “TA ONLY” is displayed on the NDs.

Ident.: DSC-34-20-60-10-10-00020251.0001001 / 17 MAR 17

STANDBY MODE

In the standby mode, the advisory generation and surveillance functions are not active. The TCAS does not trigger any alert. No TCAS information can be displayed on the PFDs and NDs.

AP/FD TCAS

Ident.: DSC-34-20-60-10-00020252.0001001 / 18 MAY 22
Applicable to: LV-KAN, LV-KAO

MODE

The AP/FD TCAS mode is a vertical guidance mode of the AP/FD.

In the case the TCAS generates a Resolution Advisory (RA) alert, this mode automatically engages to assist the flight crew to follow the RA orders, and to revert toward initial trajectory:
- Automatically if the AP is engaged, or
- Manually with the guidance of the Flight Director (FD), if the AP is not engaged.

The AP/FD TCAS mode optimizes the vertical speed for a rapid and appropriate response to an RA, and minimizes the deviations from the latest ATC clearance.
When the TCAS is operating in TA only mode, the AP/FD TCAS mode is inhibited.

INTRUDER DETECTION

Based on the received information from the intruders, the TCAS may generate the following sequence of alerts:

- **If the TCAS considers the intruder to be a possible collision threat:**
  - It generates a visual and aural Traffic Advisory (TA).
  - In that case, the AP/FD TCAS mode automatically arms: TCAS appears on the FMA to inform the flight crew that the AP/FD TCAS mode will be available in the case a Resolution Advisory (RA) is subsequently triggered.
- **If the TCAS considers the intruder to be a real collision threat:**
  - It generates a visual and aural Resolution Advisory (RA).
  - The AP/FD TCAS mode automatically engages: TCAS appears on the FMA. The flight crew has vertical guidance to fly the RA orders, automatically with the AP/FD, or manually with the FDs only (if AP was not engaged).

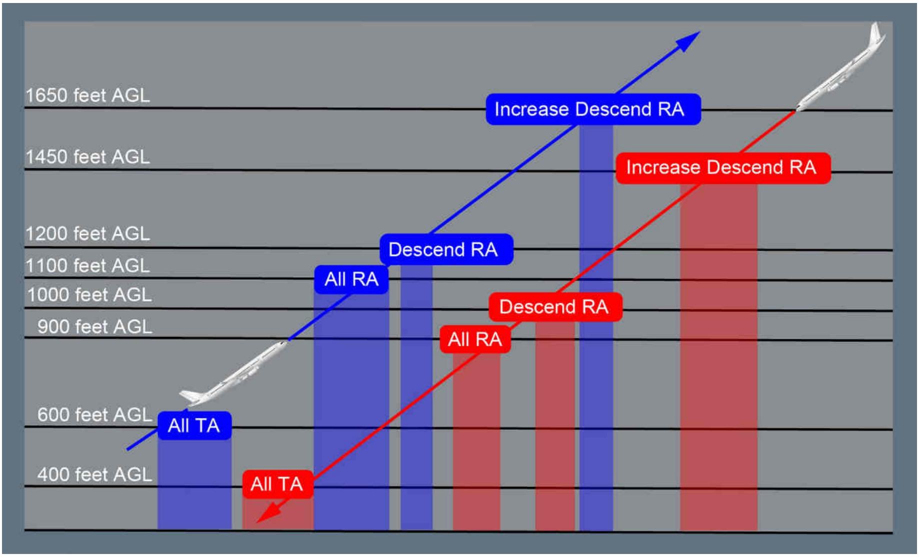
- If the A/THR is disconnected, it automatically becomes armed or active, depending on the thrust lever position. When active, the speed/Mach mode engages, and the speed/Mach control becomes selected. For more information, *Refer to DSC-22_30-40-100 Normal Operations - When a RA is triggered*.
- The vertical speed scale on the PFD indicates the vertical speed range within which the aircraft should fly.

● **When the TCAS considers that there is no more collision threat:**

- It triggers the "CLEAR OF CONFLICT" aural alert.
- In most of the cases, the AP/FD TCAS mode automatically reverts to V/S mode. The vertical speed target leads the aircraft toward the FCU selected altitude. If the altitude capture conditions are met at the clear of conflict, the AP/FD TCAS mode can revert to an altitude acquire, or an altitude hold mode. *Refer to DSC-22_30-40-100 Normal Operations - When Clear of Conflict*.

ADVISORY INHIBITION

Ident.: DSC-34-20-60-10-00020254.0004001 / 19 APR 22
Applicable to: ALL


1650 feet AGL
1450 feet AGL
1200 feet AGL
1100 feet AGL
1000 feet AGL
900 feet AGL
600 feet AGL
400 feet AGL
Increase Descend RA
Increase Descend RA
Descend RA
Descend RA
All RA
All RA
All TA
All TA

Some advisories are inhibited depending on the aircraft altitude:

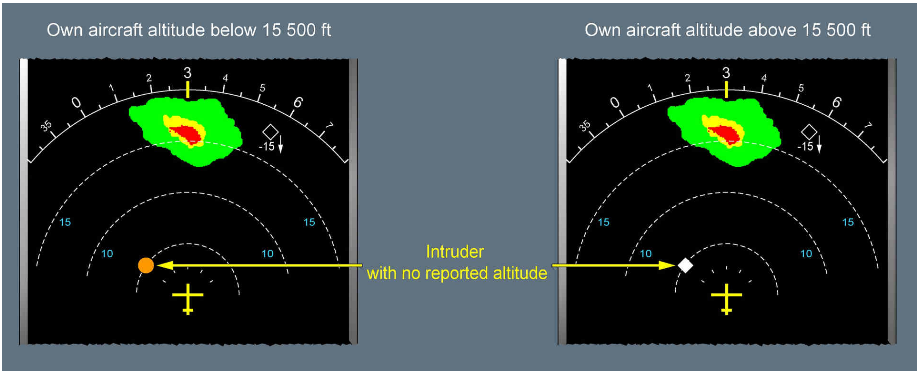
- All intruders flying below 380 ft AGL when the own aircraft altitude is below 1 750 ft AGL in climb or 1 650 ft AGL in descent
- All TA aural messages below 600 ft AGL in climb or below 400 ft AGL in descent
- All RA aural messages below 1 100 ft AGL in climb or 900 ft AGL in descent. In this case, the RA are converted into TA
- “Descend” RA below 1 200 ft AGL in climb or 1 000 ft AGL in descent
- “Increase Descent” RA below 1 650 ft AGL in climb or 1 450 ft AGL in descent
- The AP/FD TCAS ◁* flight guidance mode is inhibited below 900 ft.

TCAS INTRUDER WITH NO REPORTED ALTITUDE

Ident.: DSC-34-20-60-10-00022052.0001001 / 05 JUN 18
Applicable to: ALL

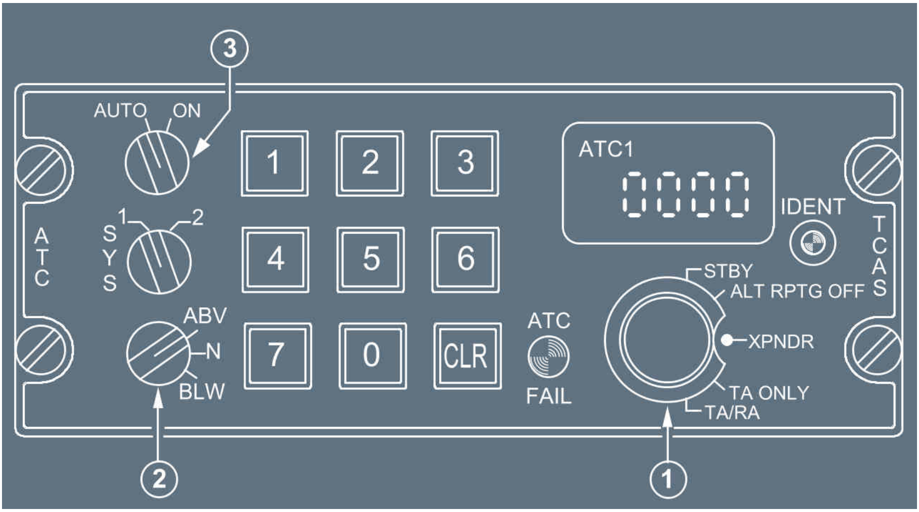
For intruders that do not report their altitude:

- The relative altitude does not appear on ND
- The TCAS never triggers any RA
- The TCAS inhibits the TA when own aircraft altitude is above 15500 ft.


Own aircraft altitude below 15 500 ft
Own aircraft altitude above 15 500 ft
Intruder
with no reported altitude
35
0
1
2
3
4
5
6
7
-15
15
10

ATC/TCAS PANEL

Ident.: DSC-34-20-60-20-00020255.0015001 / 17 MAR 17
Applicable to: LV-KAN, LV-KAO



(1) Mode selector

TA/RA: Normal position. TAs, RAs, proximate and other intruders are displayed.

TA : This mode should be used in case of aircraft degraded performance (engine failure, landing gear extended, or approach on parallel runways).
All RAs are converted into TAs. TAs, proximate and other intruders are displayed.

STBY : TCAS and ATC are on standby.

XPNDR : - The TCAS is on standby.
- On ground : The selected ATC Transponder only operates in the selective aircraft interrogation mode of Mode S.
- In flight : The selected ATC Transponder operates.

(2) Altitude range switch

Sets the altitude range, within which other intruders will be displayed on the NDs.

ABV : The altitude range is set to +9 900 ft above the aircraft, and -2 700 ft below the aircraft.

N : The altitude range is set to -2 700 ft below the aircraft, and +2 700 ft above the aircraft.

BLW : The altitude range is set to -9 900 ft below the aircraft, and +2 700 ft above the aircraft.

(3) AUTO/ON selector or THRT/ALL selector

ON (or ALL) : All intruders are displayed.

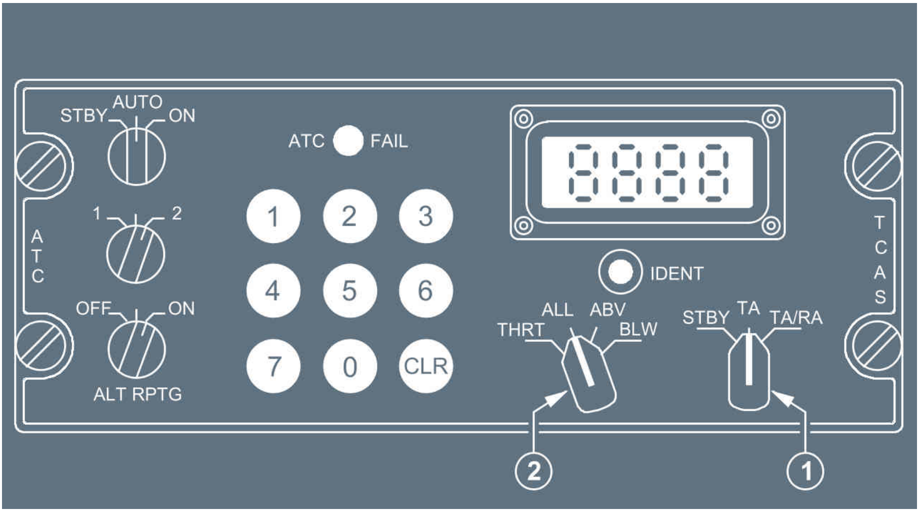
AUTO (or THRT) : Proximate and other intruders are only displayed, if a TA or RA is already presented.

Note: *Some TCAS control panels are equipped with a THRT/ALL selector, instead of the AUTO/ON selector. The associated functions remain unchanged.*

ATC/TCAS PANEL

Ident.: DSC-34-20-60-20-00020255.0003001 / 17 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU


STBY
AUTO
ON
ATC
FAIL
8888
1
2
A T C
1
2
3
4
5
6
7
0
CLR
OFF
ON
ALT RPTG
IDENT
T C A S
THRT
ALL
ABV
BLW
STBY
TA
TA/RA
2
1

(1) Mode sel pb

TA/RA: Normal position.

Proximate and other intruders, TAs and RAs are displayed provided:
- The ALT RPTG switch is at ON, and
- The ATC mode selector is at ON or AUTO.

TA :	To be used in case of aircraft degraded performance (engine failure, landing gear extended or approach on parallel runways). All RAs are converted into TAs. TAs, proximate and other intruders are displayed.
STBY :	TCAS is on standby.

(2) TRAFFIC sel

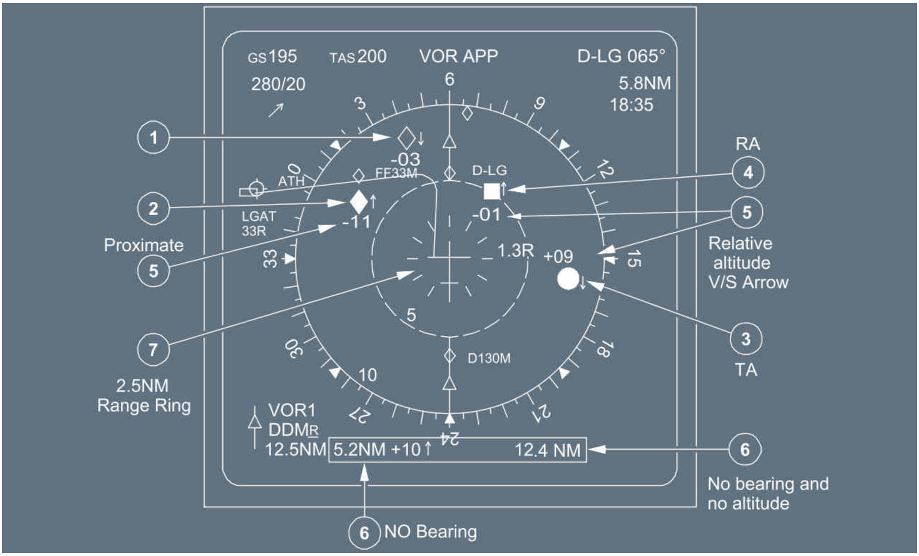
The TRAFFIC selection affects only the display of proximate and others.

THRT :	Proximate and other intruders are displayed only when a TA or RA is present and they are within 2 700 ft above and 2 700 ft feet below the aircraft.
ALL :	Proximate and other intruders are always displayed, even if no TA or RA is present. (FULL TIME display) The altitude range is 2 700 ft above the aircraft to 2 700 ft below.
ABV :	The same as ALL, except that the others intruders are displayed if within 9 900 ft above the aircraft and 2 700 ft below.
BLW :	The same as ALL, except that the other intruders are displayed if within 9 900 ft below the aircraft and 2 700 ft above.

ND INDICATIONS

Ident.: DSC-34-20-60-20-00020256.0002001 / 05 JUN 18
Applicable to: ALL

The traffic is displayed in all ROSE modes and ARC mode whatever NM range is selected. Only the eight most threatening intruders are displayed.


GS195
TAS200
VOR APP
D-LG 065°
280/20
6
5.8NM
18:35
1
-03
FF33M
ATH
D-LG
RA
4
2
-11
-01
LGAT
33R
5
Proximate
5
1.3R
+09
Relative
altitude
V/S Arrow
3
TA
7
2.5NM
Range Ring
D130M
10
VOR1
DDMR
12.5NM
5.2NM +10↑
12.4 NM
6
No bearing and
no altitude
6
NO Bearing

(1) Other intruder
Indicated by a white empty diamond.

(2) Proximate intruder
Indicated by a white filled diamond.

(3) TA intruder
Indicated by an amber circle.
Associated with the "TRAFFIC-TRAFFIC" aural message.

(4) RA intruder
Indicated by a red square.
Associated with vertical orders displayed on the PFD and aural messages.

Note: *If the range of an intruder is not available, the intruder is not displayed.*
An intruder may be partially displayed when its range is out of scale.

(5) Relative altitude/Vertical Speed arrow

Relative altitude : indicated in hundred of feet above or below the symbol depending on the intruder position.

Vertical speed arrow : displayed only if the intruder vertical speed is greater than ± 500 ft/min

The relative altitude and vertical speed arrow are displayed in the same color as the associated intruder symbol.
When an intruder does not report its altitude, the relative altitude and the vertical movement are not displayed.

(6) No Bearing Intruder

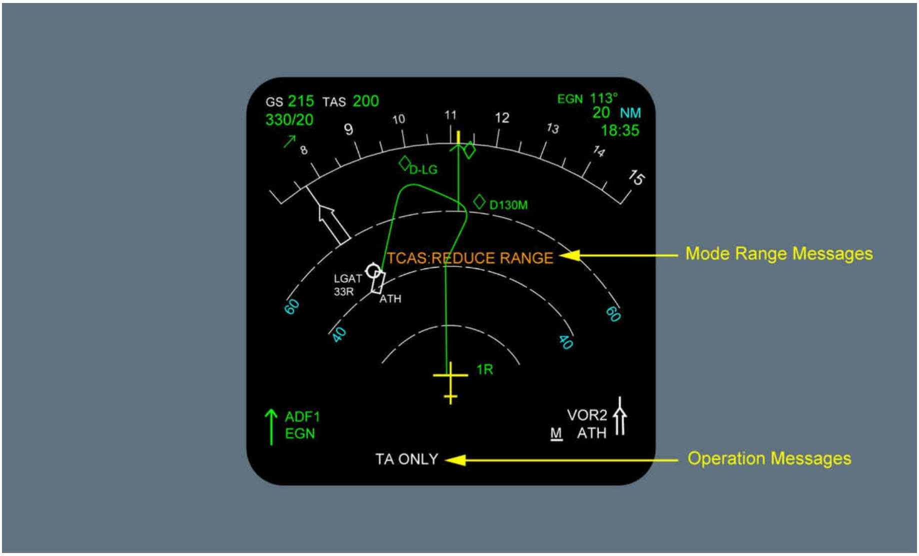
If the bearing of TA or RA intruder is not available the following data is presented in digital form at the bottom of the ND :
- range
- relative altitude and vertical speed arrow if available.

Displayed amber or red according to threat level.

(7) Range Ring
A 2.5 NM white range ring is displayed when a 10 or 20 NM range is selected.

MESSAGES ON ND

Ident.: DSC-34-20-60-20-00020257.0001001 / 03 NOV 23
Applicable to: ALL


GS 215 TAS 200
330/20
EGN 113°
20 NM
18:35
8
9
10
11
12
13
14
15
D-LG
D130M
TCAS:REDUCE RANGE
LGAT
33R
ATH
60
40
40
60
1R
ADF1
EGN
VOR2
M ATH
TA ONLY
Mode Range Messages
Operation Messages

MODE AND RANGE MESSAGES

Following messages can be displayed to draw pilot’s attention:

TCAS : REDUCE RANGE	Displayed when a TA is detected and ND range above 40 NM.
TCAS : REDUCE RANGE	Displayed when a RA is detected and ND range above 40 NM.
TCAS : CHANGE MODE	Displayed when a TA is detected and ND mode is PLAN.
TCAS : CHANGE MODE	Displayed when a RA is detected and ND mode is PLAN.

OPERATION MESSAGES

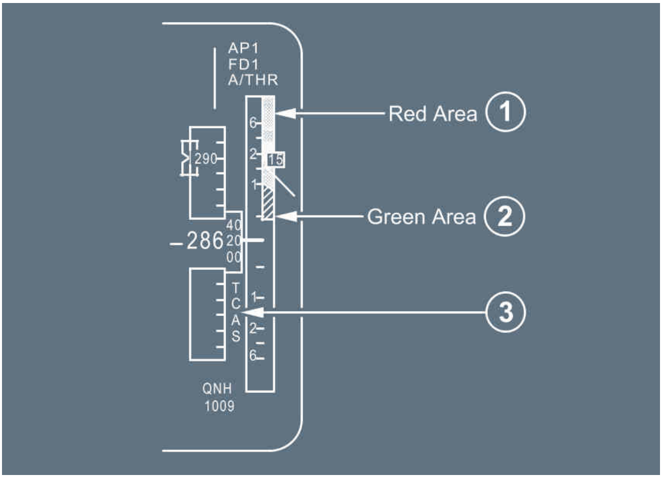
TA ONLY	Displayed when the TA mode is selected automatically, or manually by the flight crew.
TCAS ADS-B (ATSAW)	Displayed in the case of an internal TCAS failure affecting also the ATSAW function.
TCAS ADS-B ONLY (ATSAW)	Displayed in the case of an internal TCAS failure not affecting the ATSAW function. *Note:* *TCAS symbols are removed from ND. ATSAW traffic is displayed with "ADS-B Only" symbols.*
ADS-B (ATSAW)	Displayed in the case of ATSAW failure without TCAS failure. *Note:* *ATSAW traffic symbols are removed from ND. TCAS symbols remain available.*

PFD INDICATIONS

Ident.: DSC-34-20-60-20-00020258.0002001 / 17 MAR 17
Applicable to: ALL

In case of RA detection, the vertical speed scale becomes rectangular and the PFD presents vertical orders on the vertical speed scale. The vertical speed scale background is normally grey, but may be partially replaced by green and/or red areas.

Note: *When TCAS information has to be displayed on the vertical speed scale, the grey background of the air speed and heading scales are removed.*



(1) Red area
Indicates the vertical speed where the risk of conflict is high.

(2) Green area
Indicates the recommended vertical speed range. ("FLY TO" sector).

Note: *The aircraft can also fly in the grey vertical speed range without the risk of conflict (preventive RA).*

(3) TCAS message
It is displayed when the TCAS cannot deliver RA data, or in case of a TCAS internal failure, provided that the TCAS is not in standby.

Note: *When within the red area, the vertical speed needle and digits change to red, but in a different pattern, so that it is possible to clearly distinguish them from the background.*

AURAL MESSAGES

Ident.: DSC-34-20-60-20-00020267.0012001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

TA/RA detection is associated with the following messages:

“TRAFFIC TRAFFIC”	:	Only in case of TA detection.
"CLIMB CLIMB"	:	Climb at the vertical speed indicated by the green area on the PFD.
“CLIMB, CROSSING CLIMB” (twice)	:	Same as above. Indicates that you will cross through the intruder altitude.

“INCREASE CLIMB” (twice) : Triggered after the CLIMB message, if the vertical speed is insufficient to achieve safe vertical separation.
“DESCEND, DESCEND" : Descend at the vertical speed indicated by the green area on the PFD.
“DESCEND, CROSSING DESCEND” (twice) : Same as above. Indicates that you will cross through the intruder altitude.
“INCREASE DESCEND” (twice) : Triggered after the DESCEND message, if the vertical speed is insufficient to achieve safe vertical separation.
"LEVEL OFF, LEVEL OFF" : Set the Vertical Speed to 0.
“CLIMB, CLIMB NOW” (twice) : Triggered after the DESCEND message, if the intruder trajectory has changed.
“DESCEND, DESCEND NOW” (twice) : Triggered after the CLIMB message, if the intruder trajectory has changed.
“MONITOR VERTICAL SPEED” : Ensure that the vertical speed remains outside the red area. Triggered only once, in case of preventive RA.
"MAINTAIN VERTICAL SPEED, MAINTAIN" : Maintain the vertical speed within the green area and/or out of the red area of the vertical speed scale.
"MAINTAIN VERTICAL SPEED ... CROSSING MAINTAIN" : Maintain the vertical speed indicated on the green area of the PFD. Indicates that you will cross through the intruder altitude.
“CLEAR OF CONFLICT” : The range increases, and separation is adequate. Return to assigned clearance.

AURAL MESSAGES

Ident.: DSC-34-20-60-20-00020267.0004001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

TA/RA detection is associated with the following messages:
“TRAFFIC TRAFFIC” : Only in case of TA detection.
"CLIMB CLIMB" : Climb at the vertical speed indicated by the green area on the PFD.
“CLIMB, CROSSING CLIMB” (twice) : Same as above. Indicates that you will cross through the intruder altitude.
“INCREASE CLIMB” (twice) : Triggered after the CLIMB message, if the vertical speed is insufficient to achieve safe vertical separation.

"DESCEND, DESCEND"	Descend at the vertical speed indicated by the green area on the PFD.
"DESCEND, CROSSING DESCEND" (twice)	Same as above. Indicates that you will cross through the intruder altitude.
"INCREASE DESCEND" (twice)	Triggered after the DESCEND message, if the vertical speed is insufficient to achieve safe vertical separation.
"ADJUST VERTICAL SPEED, ADJUST"	Adjust the vertical speed to that indicated by the green area of the PFD, reducing climb vertical speed or descent vertical speed, as appropriate.
"CLIMB, CLIMB NOW" (twice)	Triggered after the DESCEND message, if the intruder trajectory has changed.
"DESCEND, DESCEND NOW" (twice)	Triggered after the CLIMB message, if the intruder trajectory has changed.
"MONITOR VERTICAL SPEED"	Ensure that the vertical speed remains outside the red area. Triggered only once, in case of preventive RA.
"MAINTAIN VERTICAL SPEED, MAINTAIN"	Maintain the vertical speed within the green area and/or out of the red area of the vertical speed scale.
"MAINTAIN VERTICAL SPEED ... CROSSING MAINTAIN"	Maintain the vertical speed indicated on the green area of the PFD. Indicates that you will cross through the intruder altitude.
"CLEAR OF CONFLICT"	The range increases, and separation is adequate. Return to assigned clearance.

MEMO DISPLAY

Ident.: DSC-34-20-60-20-00020268.0018001 / 17 MAR 17
Applicable to: ALL

TCAS STBY : This memo appears in amber in flight phase 6 when:

- The flight crew selects TCAS STBY or ATC STBY on the ATC/TCAS panel, or
- Both ATCs or both RAs fail, or
- The flight crew turns OFF the ALT RPTG sw, or
- In the case of a triple ADR failure.

TCAS STBY : This memo appears in green in flight phases 2 and 7 when:

- The flight crew selects TCAS STBY or ATC STBY on the ATC/TCAS panel, or
- Both ATCs or both RAs fail, or
- The flight crew turns OFF the ALT RPTG sw, or
- In the case of a triple ADR failure.

AIRCRAFT SYSTEMS

OXYGEN

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DSC-35-10 General

Description........A

DSC-35-20 Fixed Oxygen System for Cockpit

DSC-35-20-10 Description

General........A
Operation........B
Schematics........C
Mask Donning........D
Mask Stowage........E

DSC-35-20-20 Controls and Indicators

Overhead Panel........A
Lateral Consoles........B
Crew Oxygen Mask........C
Pressure Regulator........D
ECAM Door/Oxy Page........E

DSC-35-20-30 How to

How to Test the Mask........A

DSC-35-30 Fixed Oxygen System for Cabin

DSC-35-30-10 Description

General........A
Operation........B
Schematic........C

DSC-35-30-20 Controls and Indicators

Overhead Panel........A
Maintenance Panel........B
Memo Display........C

DSC-35-40 Portable Oxygen System

DSC-35-40-10 Description

Flight Crews Portable Oxygen System........A
Using the Hood........B

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DESCRIPTION

Ident.: DSC-35-10-00000932.0001001 / 10 JAN 11
Applicable to: ALL

The oxygen system consists of:
- A cockpit-fixed oxygen system, which supplies adequate breathing oxygen to the cockpit occupants in case of depressurization, or emission of smoke and noxious gases.
- A cabin-fixed oxygen system, which supplies oxygen for cabin occupants (passengers and cabin crew) in case of depressurization.
- A portable oxygen system, which is provided in both the cockpit and cabin and is to be used:
  - As PROTECTION for the crew during on board emergencies.
  - For FIRST AID purposes.

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GENERAL

Ident.: DSC-35-20-10-00017595.0001001 / 21 MAR 16
Applicable to: ALL

The cockpit's fixed oxygen system consists of:

- One (or two ◁) high-pressure cylinder located in the left-hand lower fuselage
- One (or two ◁) pressure regulator, connected directly to the cylinder that delivers oxygen, at a pressure suitable for user
- Two overpressure safety systems to vent oxygen overboard, through a safety port, if the pressure becomes too high
- A supply solenoid valve that allows the crew to shut off the distribution system
- Four full-face quick-donning masks, stowed in readily-accessible boxes adjacent to the crewmembers seats (one at each seat)
- One or two filling port for external oxygen replenishment ◁ .

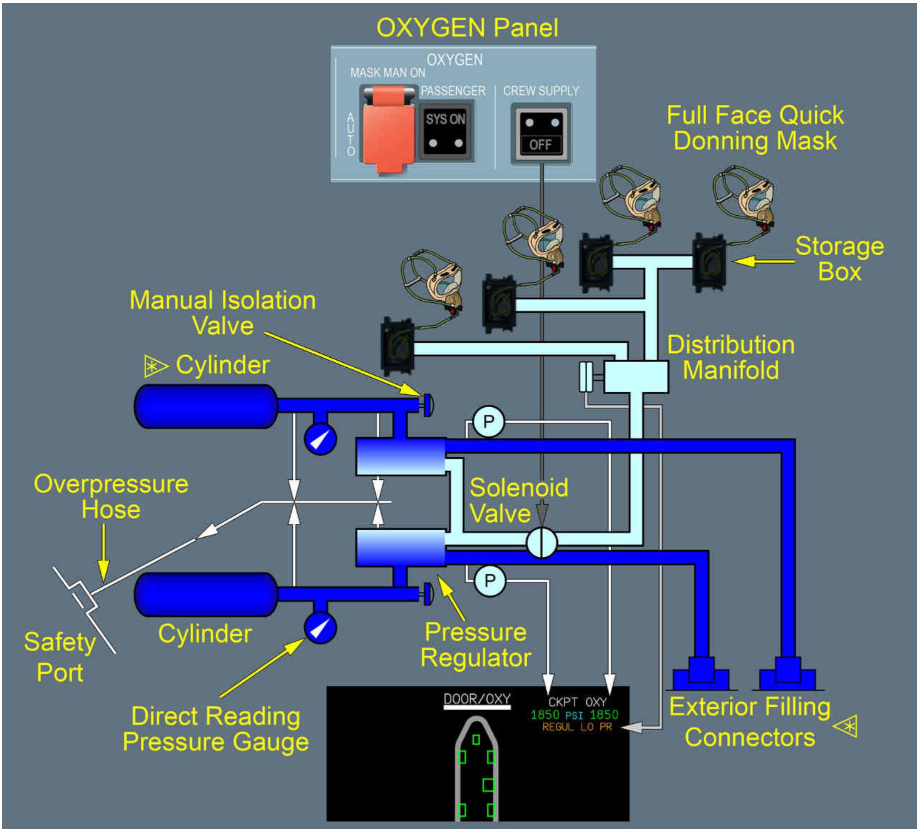
OPERATION

Ident.: DSC-35-20-10-00017203.0001001 / 31 MAR 17
Applicable to: ALL

The crewmember squeezes the red grips to pull the mask out of its box, and this action causes the mask harness to inflate.
A mask-mounted regulator supplies a mixture of air and oxygen or pure oxygen, or performs emergency pressure control. With the regulator set to NORMAL, the user breathes a mixture of cabin air and oxygen up to the cabin altitude at which the regulator supplies 100 % oxygen. The user can select 100 %, in which case the regulator supplies pure oxygen at all cabin altitudes.
If the situation calls for it, the user can use the emergency overpressure rotating knob and receive pure oxygen at positive pressure.
The storage box contains a microphone lead, with a quick-disconnect, for connection to the appropriate mask microphone cable.

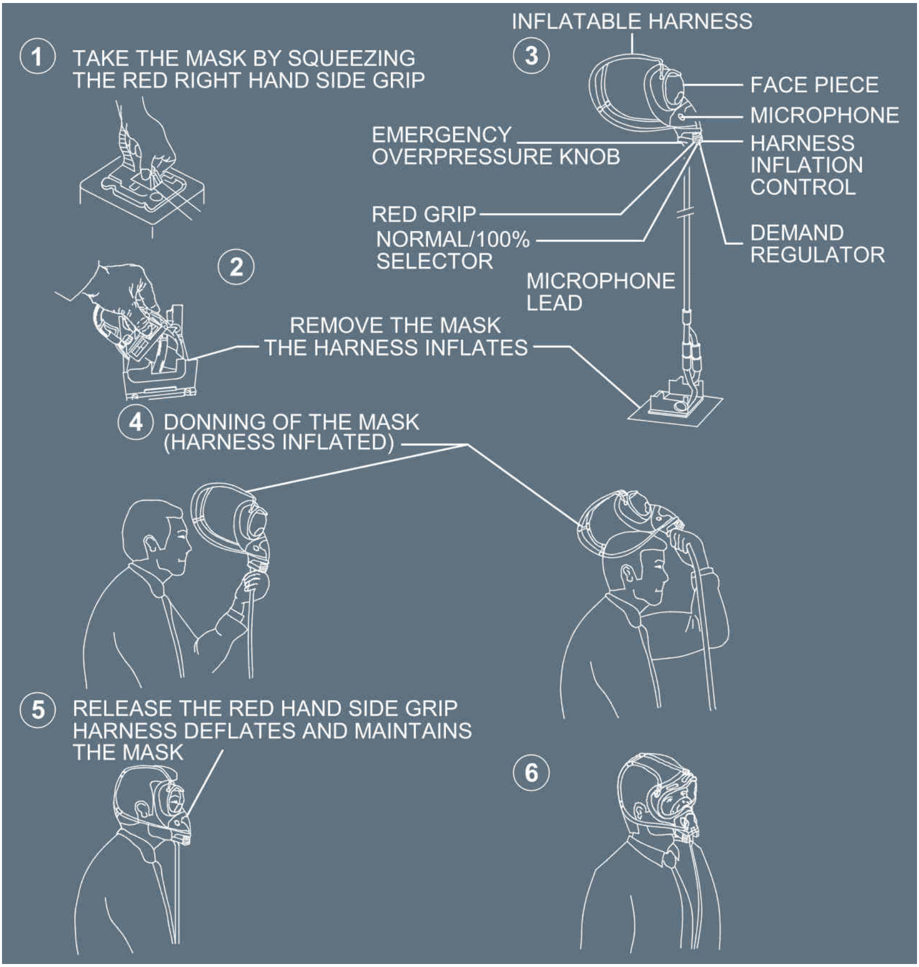
SCHEMATICS

Ident.: DSC-35-20-10-00020789.0001001 / 31 MAR 17
Applicable to: ALL


OXYGEN Panel
OXYGEN
MASK MAN ON
PASSENGER
CREW SUPPLY
AUTO
SYS ON
OFF
Full Face Quick Donning Mask
Storage Box
Manual Isolation Valve
Cylinder
Distribution Manifold
P
Overpressure Hose
Solenoid Valve
P
Safety Port
Cylinder
Pressure Regulator
Direct Reading Pressure Gauge
DOOR/OXY
CKPT OXY
1850 PSI 1850
REGUL LO PR
Exterior Filling Connectors

MASK DONNING

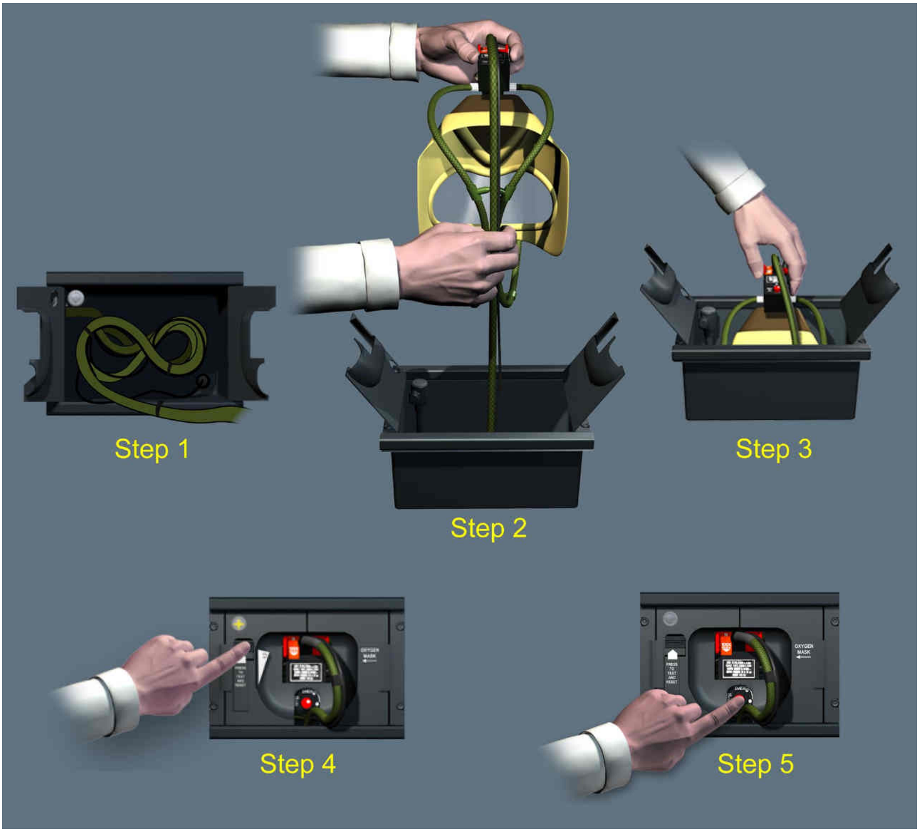
Ident.: DSC-35-20-10-00000969.0001001 / 01 JUN 17
Applicable to: ALL


① TAKE THE MASK BY SQUEEZING THE RED RIGHT HAND SIDE GRIP
INFLATABLE HARNESS
③
FACE PIECE
MICROPHONE
EMERGENCY OVERPRESSURE KNOB
HARNESS INFLATION CONTROL
RED GRIP
NORMAL/100% SELECTOR
DEMAND REGULATOR
②
MICROPHONE LEAD
REMOVE THE MASK THE HARNESS INFLATES
④ DONNING OF THE MASK (HARNESS INFLATED)
⑤ RELEASE THE RED HAND SIDE GRIP HARNESS DEFLATES AND MAINTAINS THE MASK
⑥

Note: The captain (first officer) must exercise caution and turn the head to the right (left) in the direction of the first officer (captain) in order to ensure fast donning of the mask when the HUD ◁ on the captain (first officer) side is deployed.

MASK STOWAGE

Ident.: DSC-35-20-10-00000971.0001001 / 03 NOV 22
Applicable to: ALL


Step 1
Step 2
Step 3
Step 4
Step 5
OXYGEN MASK
PRESS TO TEST AND RESET

STEP 1

Coil the supply hose that is connected to the crew oxygen mask in an "eight (8)" symbol and place it in the bottom of the stowage box.

STEP 2

Position the remaining hose in the middle of the mask.
Fold the two harness portions together.

STEP 3

Put the mask in the stowage box.
Make sure that the mask touches the bottom of the stowage box.

STEP 4

Close the doors of the mask stowage box.
Firmly press the PRESS TO TEST AND RESET pb.
When released, check that the OXY ON flag disappears.

STEP 5

Press the EMERGENCY selector, and check that the blinker remains black.
Return the N/100% selector to the 100% position.

CAUTION	Maintaining the EMERGENCY selector in the EMERGENCY position can deplete the crew oxygen cylinder.

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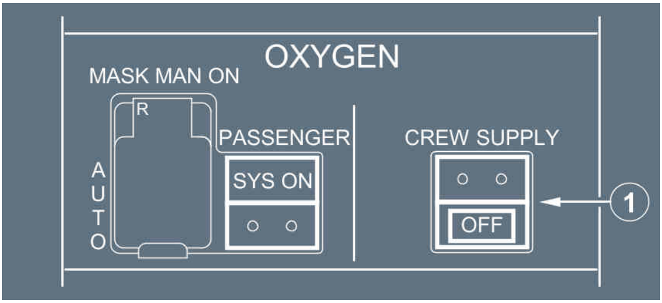
OVERHEAD PANEL

Ident.: DSC-35-20-20-00000972.0001001 / 09 OCT 12
Applicable to: ALL


OXYGEN
MASK MAN ON
R
AUTO
PASSENGER
SYS ON
CREW SUPPLY
OFF
1

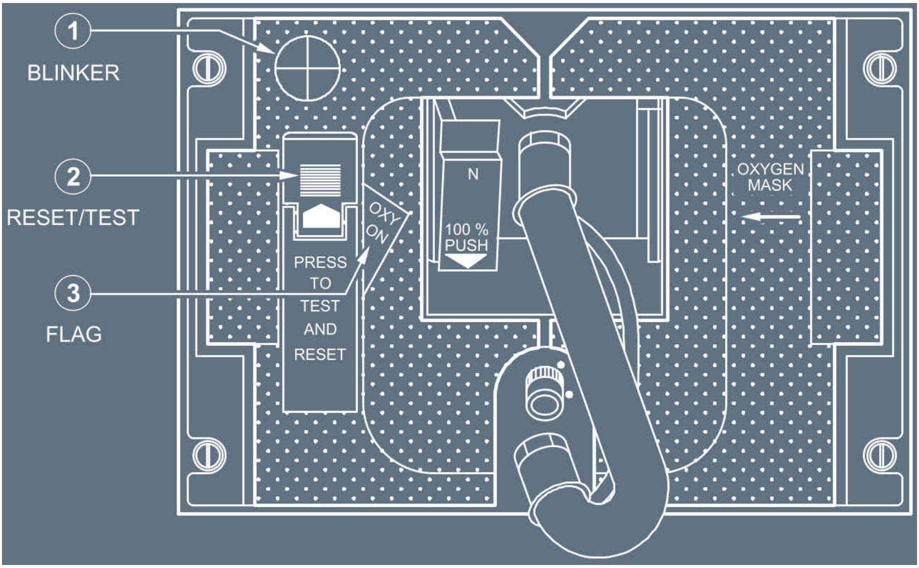
(1) CREW SUPPLY pushbutton
This pushbutton controls the solenoid valve.

On : The valve is open, and supplies low pressure oxygen to the masks (normal position in flight).

OFF: The valve is closed, and the white light comes on.

LATERAL CONSOLES

Ident.: DSC-35-20-20-00000977.0001001 / 09 OCT 12
Applicable to: ALL



(1) Blinker flowmeter (yellow)
This indicator flashes when oxygen is flowing.

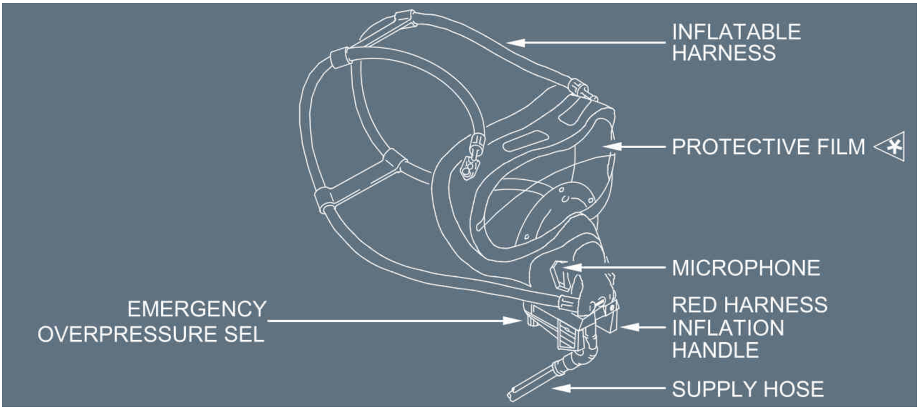
(2) RESET / TEST control slide
The crewmember presses the slide, and pushes it in the direction of the arrow to test: The operation of the blinker, the regulator supply, the system sealing downstream of the valve, and the regulator sealing and system operation. Pressing the RESET control slide, after the oxygen mask has been used, cuts off the oxygen and the mask microphone.

(3) OXY ON flag
As soon as the left flap door opens, the mask is supplied with oxygen and, once it closes (mask still supplied with oxygen), the “OXY ON“ flag appears.

CREW OXYGEN MASK

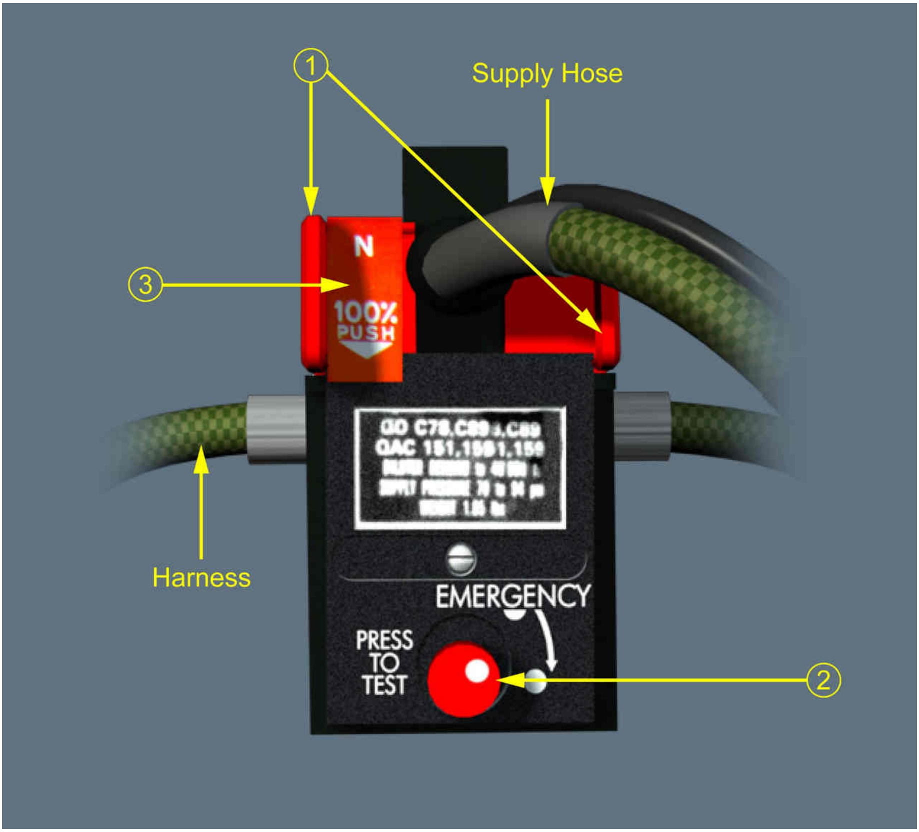
Ident.: DSC-35-20-20-00000981.0001001 / 09 OCT 12

Applicable to: ALL


INFLATABLE HARNESS
PROTECTIVE FILM ✱
MICROPHONE
EMERGENCY OVERPRESSURE SEL
RED HARNESS INFLATION HANDLE
SUPPLY HOSE

PRESSURE REGULATOR

Ident.: DSC-35-20-20-00000980.0001001 / 24 NOV 15
Applicable to: ALL



(1) Red grips
Squeezing the righthand side grip unlocks the two-flap door and permits the harness to inflate.

(2) EMERGENCY pressure selector

Use of this selector creates an overpressure, which eliminates condensation or fogging of the mask, and prevents smoke, smell or ashes from entering the mask.
- Pressing this knob generates an overpressure for a few seconds.
- Turning the knob, in the direction of the arrow, generates a permanent overpressure.

Note: *1. Overpressure supply is automatically started, when cabin altitude exceeds 30 000 ft .*

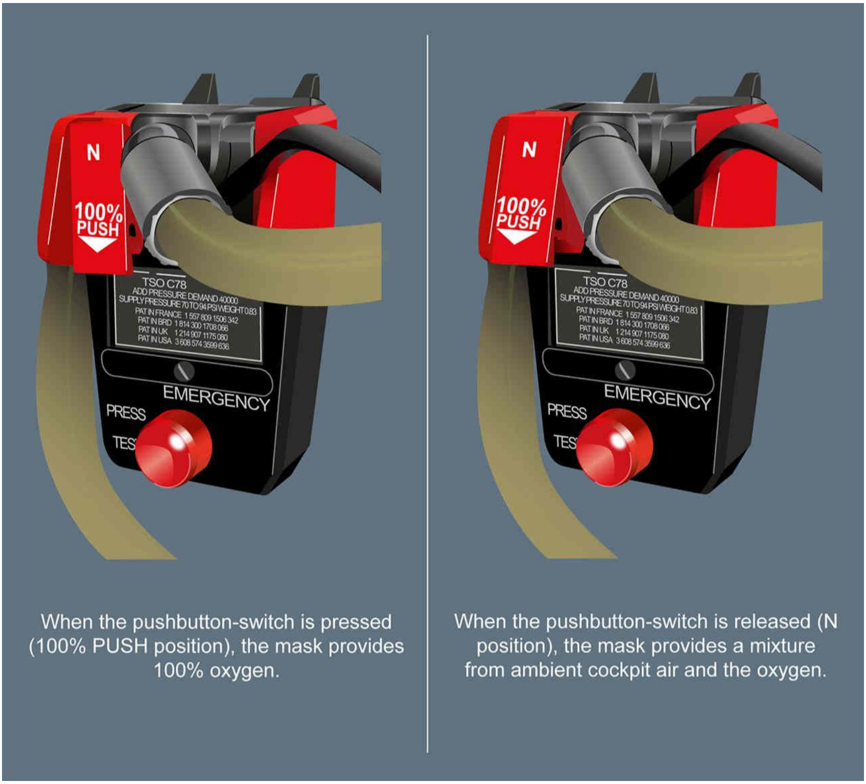
2. Overpressure supply is available, only when the N/ 100 % selector is set on the 100 % position.

(3) N/100 % sel

This two-position button is locked down (100 % position) when the crewmember pulls the mask out of the stowage. Pushing up the button from underneath releases it, and it pops up to the N (normal) position. Pressing it again returns it to 100 %.

100 % : The mask delivers 100 % oxygen.

N : The mask provides the flight crew with a mixture of air and oxygen. This mixture changes with cabin altitude. The higher the cabin altitude, the more oxygen the mask provides, until the mask supplies 100 % oxygen.

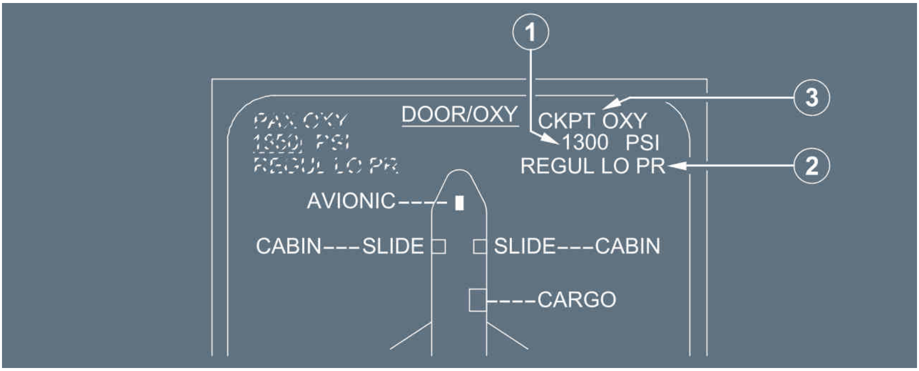

N
100% PUSH
TSO C78
ADD PRESSURE DEMAND 40000
SUPPLY PRESSURE 70 TO 94 PSI WEIGHT 0.83
PAT IN FRANCE 1 557 809 1506 342
PAT IN BRD 1 814 300 1708 066
PAT IN UK 1 214 907 1175 080
PAT IN USA 3 608 574 3599 636
EMERGENCY
PRESS
TES

When the pushbutton-switch is pressed (100% PUSH position), the mask provides 100% oxygen.

When the pushbutton-switch is released (N position), the mask provides a mixture from ambient cockpit air and the oxygen.

ECAM DOOR/OXY PAGE

Ident.: DSC-35-20-20-00000987.0005001 / 21 MAR 17
Applicable to: ALL



(1) OXY pressure indication
It is in green, when the pressure is greater than, or equal to 600 PSI.
It pulses in green, when the pressure is less than 600 PSI (the DOOR/OXY page is automatically displayed).
It is in amber, when the pressure is less than 300 PSI.
On ground, an amber half frame appears when oxygen pressure is less than 1 000 PSI.
In this case, the flight crew must check that the remaining quantity is not below the minimum (*Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure*).

(2) REGUL LO PR indication
It is in amber, if oxygen pressure on the low-pressure circuit is low (50 PSI).

(3) CKPT OXY indication
It is normally in white.

It becomes amber, when:
- The pressure goes below 300 PSI.
- Low oxygen pressure is detected.
- The overhead panel's OXYGEN CREW SUPPLY pushbutton is OFF.

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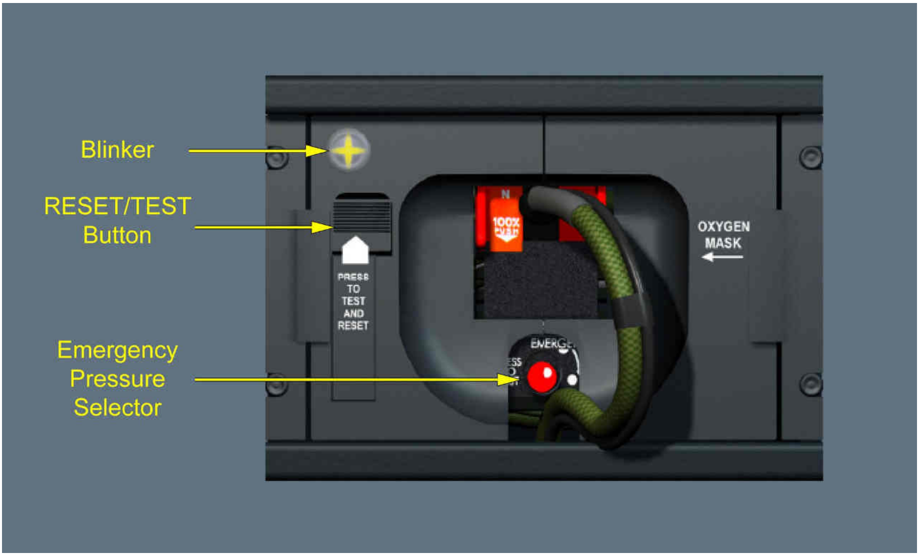
HOW TO TEST THE MASK

Ident.: DSC-35-20-30-00024454.0001001 / 04 NOV 20
Applicable to: ALL

WARNING	To prevent hearing damage to ground crew connected to the intercom system, inform them that a loud noise may be heard in the headset when performing the oxygen mask test.

Mask Stowage Box


Blinker
RESET/TEST Button
Emergency Pressure Selector
100% PUSH
N
PRESS TO TEST AND RESET
EMERG
OXYGEN MASK

- **On the OXYGEN panel:**
  CREW SUPPLY pb....................CHECK ON
- **On the glareshield:**
  LOUDSPEAKERS....................ON
- **On the ACP:**
  INT reception knob....................PRESS OUT - ADJUST
  INT/RAD sw....................INT

- **On the mask stowage box:**
  - Press and hold the RESET/TEST button in the direction of the arrow.
    - Check that the blinker turns yellow for a short time, and then goes black.
  - Hold the RESET/TEST button down, and press the Emergency Pressure selector.
    - Check that the blinker turns yellow and remains yellow, as long as the Emergency Pressure selector is pressed.
    - Listen for oxygen flow through the loudspeakers.
  - Check that the RESET/TEST button returns to the up position and the N/100% selector is in the 100 % position.
  - Press the Emergency Pressure selector again, and check that the blinker does not turn yellow. This ensures that the mask is not supplied.
  - Check that the Emergency Pressure selector is NOT turned right in the direction of the arrow (permanent overpressure). This ensures that the oxygen permanent overpressure is not supplied.

GENERAL

Ident.: DSC-35-30-10-00017210.0001001 / 05 MAR 19
Applicable to: ALL

In the case of depressurization, the fixed oxygen system in the cabin supplies oxygen to the cabin occupants.
Chemical generators ◁ produce the oxygen. Each generator supplies a group of 2, 3, 4, 5 or 6 masks. Oxygen masks are located in containers above the passenger seats, in the lavatories, in each galley, and at each cabin crew station.

Note: *Gazeous generators (if installed) replace chemical generators in the lavatories.*

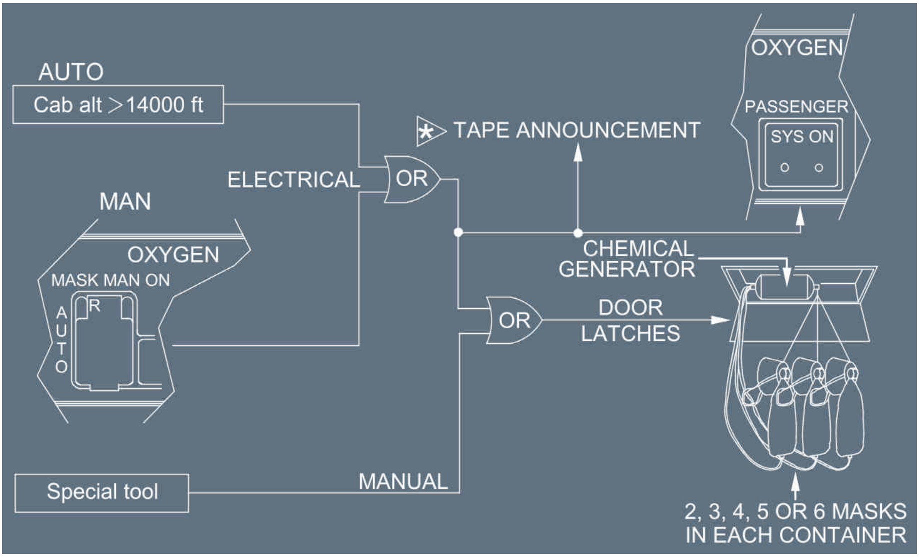
OPERATION

Ident.: DSC-35-30-10-00017596.0001001 / 21 MAR 16
Applicable to: ALL

Each container has an electrical latching mechanism that automatically opens to allow the masks to drop, if the cabin pressure altitude exceeds 14 000 ft (+250, -750 ft).
Flight crewmembers can override the automatic control.
When the masks are released, the passenger address system automatically broadcasts prerecorded instructions ◁ .
Oxygen supply begins, when the passenger pulls the mask towards the passenger seat. The chemical reaction used for oxygen generation creates heat. Therefore, a smell of burning, smoke, and an increase in cabin temperature may be associated with the normal operation of the oxygen generators. The mask receives pure oxygen under positive pressure for about 15 min ◁ , 22 min ◁ or up to 36 min ◁ , until the generator is exhausted.
A reset is available for the rearming of the system after the masks are restowed.
A manual release tool allows the crew to open the doors manually, in case of electrical failure. It is stored at the cabin attendants' station.

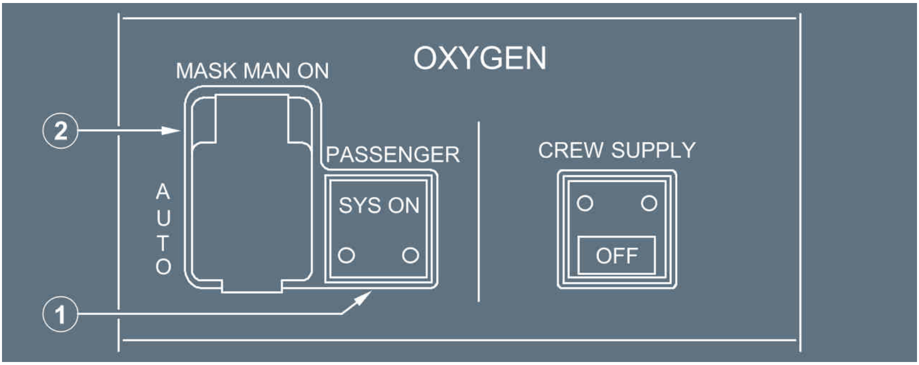
SCHEMATIC

Ident.: DSC-35-30-10-00017597.0001001 / 21 MAR 16
Applicable to: ALL


AUTO
Cab alt >14000 ft
ELECTRICAL
OR
TAPE ANNOUNCEMENT
OXYGEN
PASSENGER
SYS ON
MAN
OXYGEN
MASK MAN ON
AUTO
R
CHEMICAL
GENERATOR
OR
DOOR
LATCHES
Special tool
MANUAL
2, 3, 4, 5 OR 6 MASKS
IN EACH CONTAINER

OVERHEAD PANEL

Ident.: DSC-35-30-20-00001001.0001001 / 09 OCT 12
Applicable to: ALL



(1) PASSENGER SYS ON lt
This light comes on in white when the control for the oxygen mask doors is activated, and remains on until the TMR RESET pushbutton is pressed. (*Refer to DSC-35-30-20 Maintenance Panel*).

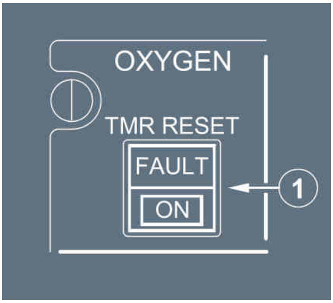
(2) MASK MAN ON pb
The guard keeps this button in the AUTO position.

AUTO : The mask doors open automatically when the cabin altitude exceeds 14 000 ft.

Pressed : The mask doors open.

MAINTENANCE PANEL

Ident.: DSC-35-30-20-00001003.0001001 / 09 OCT 12
Applicable to: ALL



(1) TMR RESET pb sw
The maintenance crew uses this pushbutton to reset the control circuit, after the system has operated.

ON : This light comes on in white, and the PASSENGER SYS ON light goes off.

FAULT : This light comes on in white, when the door latch solenoids are energized for more than 30 s.

MEMO DISPLAY

Ident.: DSC-35-30-20-00018272.0015001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

As soon as cabin oxygen masks fall down in the cabin, either automatically, or manually.

OXY PAX ON : This memo appears in green, when:

- Both CPCs detect excessive cabin altitude, or
- One CPC detects excessive cabin altitude and the other CPC is failed.

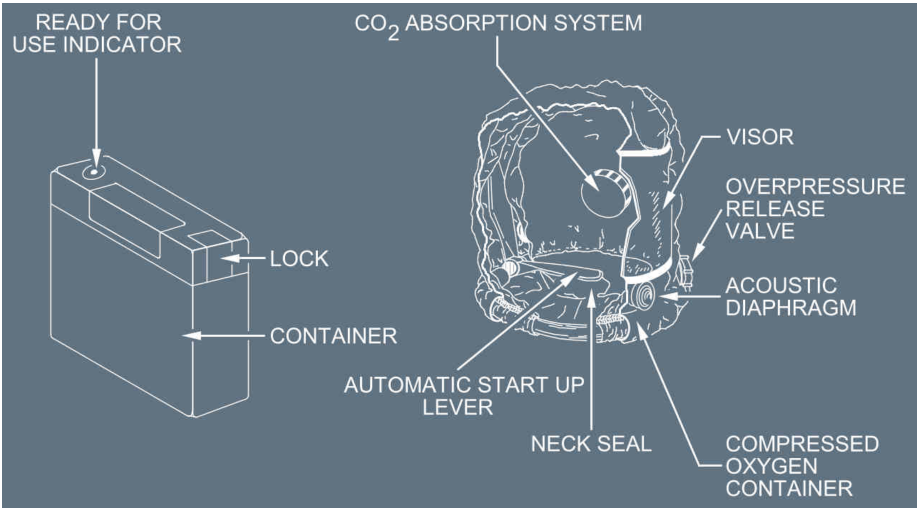
OXY PAX ON : This memo appears in amber, when:

- Both CPCs are inoperative, or do not detect excessive cabin altitude, or
- Both CPCs are operative, and only one CPC detects excessive cabin altitude.

FLIGHT CREWS PORTABLE OXYGEN SYSTEM

Ident.: DSC-35-40-10-00000994.0001001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

The smoke hood on the left back side of the cockpit protects the eyes and respiratory system of one member of the flight crew while the flight crew is fighting a fire, or if smoke and/or noxious gases enter the cabin, or if the cabin loses pressure.
The smoke hood is equipped with one oxygen cylinder and one CO2 absorption system which furnish an effective time of use of 15 min.
A « ready for use » status of the hood is ensured by checking that the indicator mounted on the hood container is not red.


READY FOR USE INDICATOR
CO$_2$ ABSORPTION SYSTEM
VISOR
OVERPRESSURE RELEASE VALVE
LOCK
ACOUSTIC DIAPHRAGM
CONTAINER
AUTOMATIC START UP LEVER
NECK SEAL
COMPRESSED OXYGEN CONTAINER

FLIGHT CREWS PORTABLE OXYGEN SYSTEM

Ident.: DSC-35-40-10-00000994.0002001 / 11 JAN 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

There is one Protective Breathing Equipment (PBE) in the cockpit. The PBE is a hood, located in a container. The PBE is stored on the left aft side of the cockpit. It ensures the eyes and respiratory system protection of one flight crew member when fighting a fire and in case of smoke or noxious gas emissions or cabin depressurization.
The PBE uses a chemical air regeneration system, which is in the breathing bag. An oronasal mask allows the user to inhale regenerated air, and it returns the exhaled breath to the regeneration system.

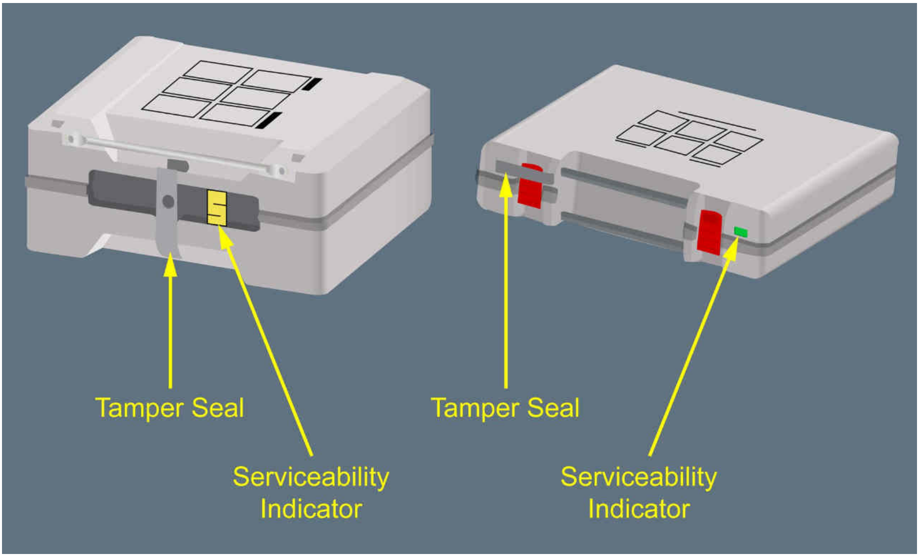
If the container is equipped with a yellow serviceability indicator:

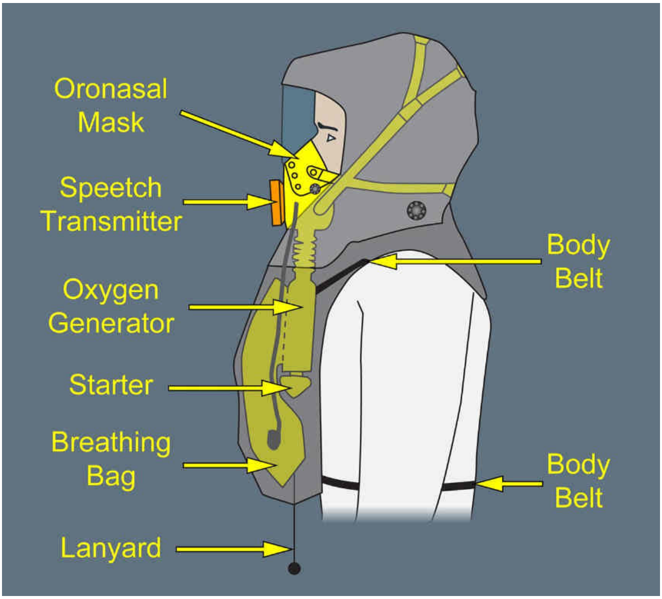
- When the indicator is cracked, the breathing protection can be insufficient and therefore the PBE cannot be used.

If the container is equipped with a red/green serviceability indicator:

- When the indicator is green, the PBE can be used.
- When the indicator is red, the breathing protection can be insufficient and therefore the PBE cannot be used.

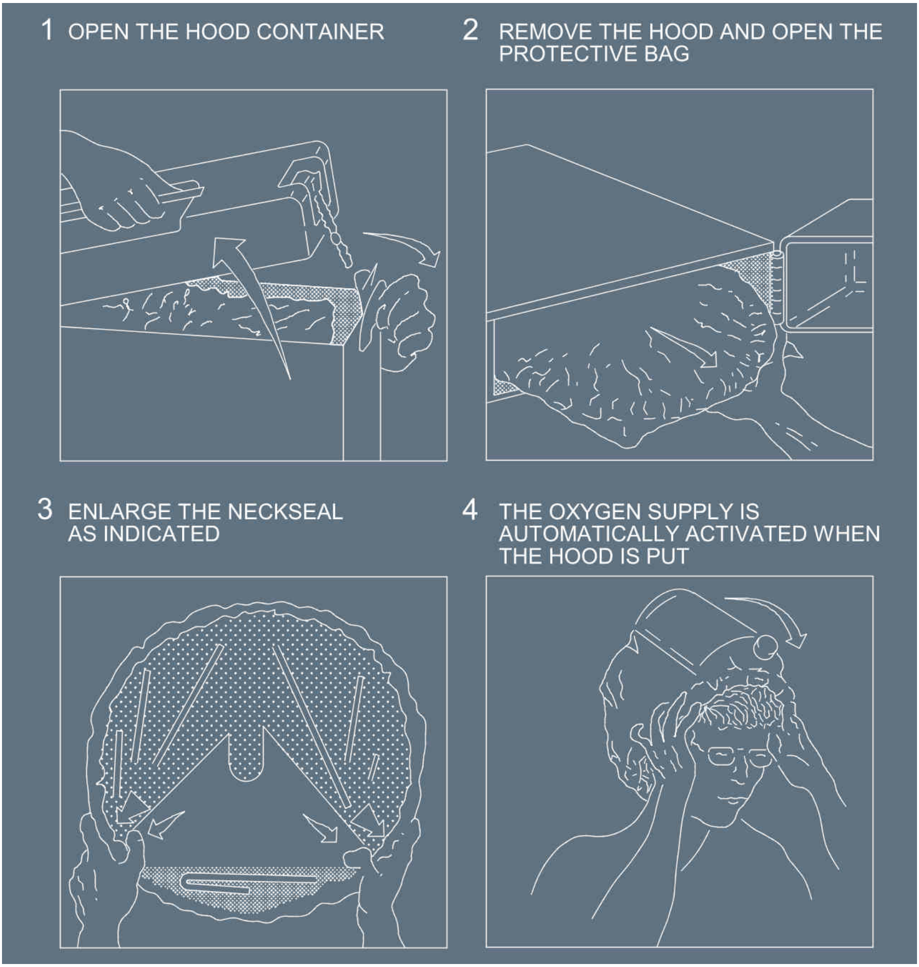
The hood operates for at least 15 min.


Tamper Seal
Serviceability Indicator
Tamper Seal
Serviceability Indicator


Oronasal Mask
Speetch Transmitter
Oxygen Generator
Starter
Breathing Bag
Lanyard
Body Belt
Body Belt

USING THE HOOD

Ident.: DSC-35-40-10-00000996.0001001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF



1 OPEN THE HOOD CONTAINER

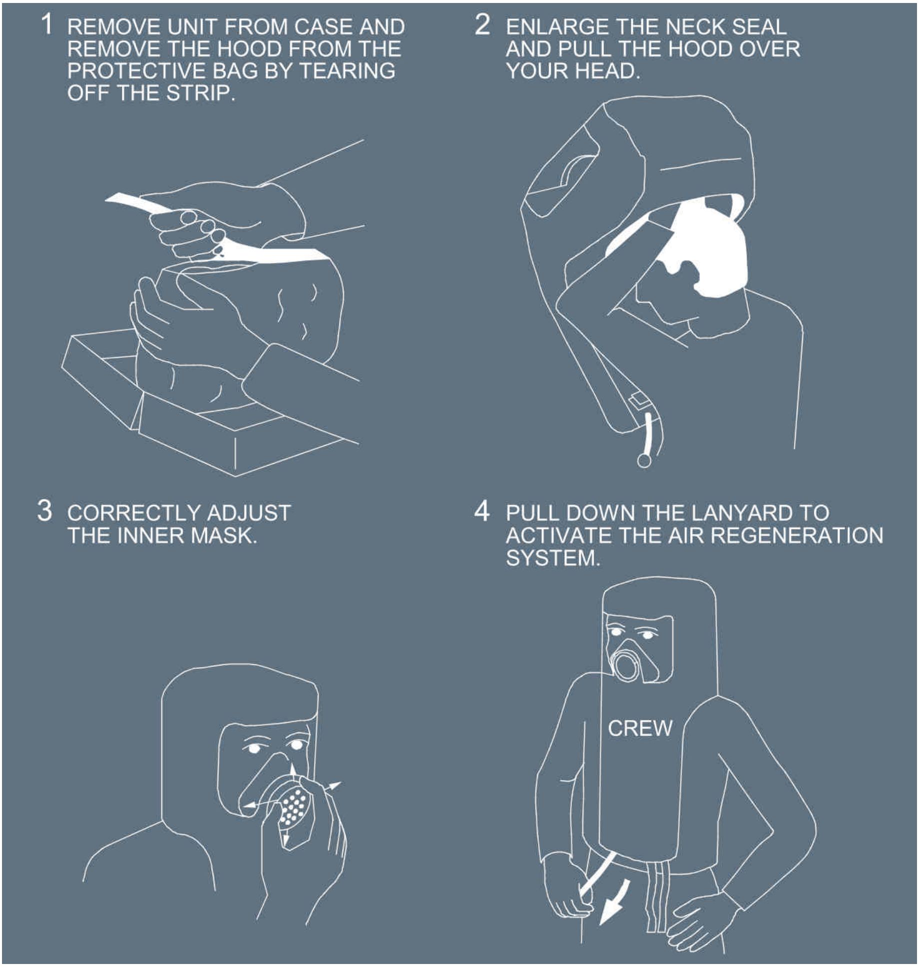
2 REMOVE THE HOOD AND OPEN THE PROTECTIVE BAG

3 ENLARGE THE NECKSEAL AS INDICATED

4 THE OXYGEN SUPPLY IS AUTOMATICALLY ACTIVATED WHEN THE HOOD IS PUT

USING THE HOOD

Ident.: DSC-35-40-10-00000996.0002001 / 09 OCT 12
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU



1 REMOVE UNIT FROM CASE AND REMOVE THE HOOD FROM THE PROTECTIVE BAG BY TEARING OFF THE STRIP.

2 ENLARGE THE NECK SEAL AND PULL THE HOOD OVER YOUR HEAD.

3 CORRECTLY ADJUST THE INNER MASK.

4 PULL DOWN THE LANYARD TO ACTIVATE THE AIR REGENERATION SYSTEM.

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AIRCRAFT SYSTEMS

PNEUMATIC

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DSC-36-10 Description

DSC-36-10-10 General

General....A

DSC-36-10-20 Engine Bleed System

General....A
Engine Air Supply....B
Pressure Regulation and Limitation....C
Temperature Regulation and Limitation....D

DSC-36-10-30 APU Bleed Air Supply

General....A

DSC-36-10-40 HP Ground Air Supply

HP Ground Air Supply....A

DSC-36-10-50 Crossbleed

General....A
ECAM Indication....B

DSC-36-10-60 Leak Detection

Leak Detection....A

DSC-36-10-70 Operation Following Failures

BMC Failure....A

DSC-36-20 Controls and Indicators

Overhead Panel....A
BLEED SD Page....B
Memo Display....C

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GENERAL

Ident.: DSC-36-10-10-00020661.0003001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The pneumatic system supplies high pressure air for :
- Air conditioning
- Engine starting
- Thrust reversers
- Wing anti-icing
- Water pressurization
- Hydraulic reservoir pressurization.
- Pack bay ventilation turbofan actuation
- Cargo heating ◁
- Fuel Tank Inerting System (FTIS) ◁ .

High pressure air is supplied from three sources :
- Engine bleed systems
- APU load compressor
- Two HP ground connections.

Note: *An external HP source may be used for air conditioning.*

Engine bleed systems are interconnected by a crossbleed duct, to which the APU and ground sources are connected.
A valve, mounted on the crossbleed duct, allows the left side (ENG 1) and the right side (ENG 2) to be interconnected.
Pneumatic system operation is controlled and monitored by two Bleed Monitoring Computers (BMC 1 and 2), the overhead control panel and the ECAM. The APU bleed supply is controlled by the APU Electronic Control Box (ECB).
A leak detection system is provided to detect any overheat in the vicinity of the hot air ducts.

GENERAL

Ident.: DSC-36-10-10-00020661.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The pneumatic system supplies high pressure air for :
- Air conditioning
- Engine starting
- Wing anti-icing
- Water pressurization
- Hydraulic reservoir pressurization
- Pack bay ventilation turbofan actuation

- Cargo heating ◁
- Fuel Tank Inerting System (FTIS) ◁ .

High pressure air is supplied from three sources :
- Engine bleed systems
- APU load compressor
- Two HP ground connections.

Note: *An external HP source may be used for air conditioning.*

Engine bleed systems are interconnected by a crossbleed duct, to which the APU and ground sources are connected.
A valve, mounted on the crossbleed duct, allows the left side (ENG 1) and the right side (ENG 2) to be interconnected.
Pneumatic system operation is controlled and monitored by two Bleed Monitoring Computers (BMC 1 and 2), the overhead control panel and the ECAM. The APU bleed supply is controlled by the APU Electronic Control Box (ECB).
A leak detection system is provided to detect any overheat in the vicinity of the hot air ducts.

GENERAL

Ident.: DSC-36-10-20-00000840.0007001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

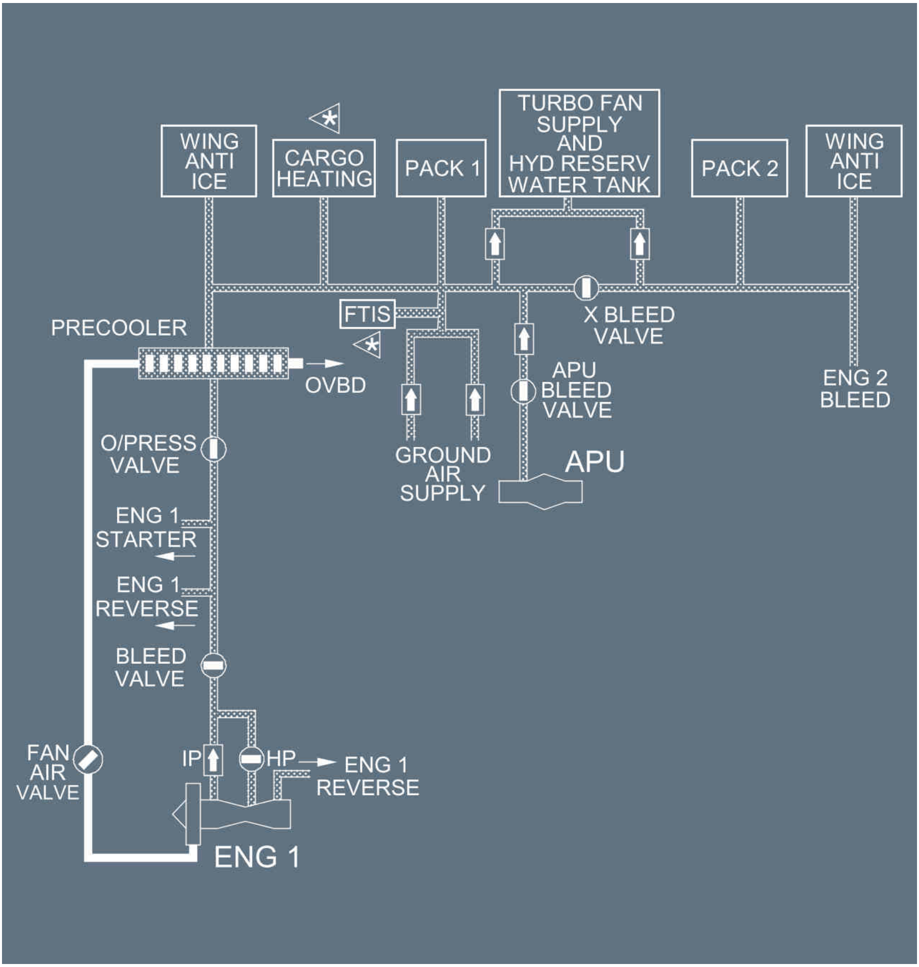
Engine bleed systems are similar

Each system is designed to:
- select the air source compressor stage
- regulate bleed air pressure
- regulate bleed air temperature

Each system is controlled and monitored by one Bleed Monitoring Computer.

Each BMC is provided with bleed pressure, temperature and valve position information, and is interconnected to:
- other systems involved with the bleed system
- the other BMC,

and provides indications and warnings to the ECAM and CMC.
In case of failure of one BMC, the other one takes over most of the monitoring functions.
The LH and RH bleed valves are electrically-controlled by BMC1 and BMC2 respectively, and are pneumatically -operated.


WING ANTI ICE
CARGO HEATING
PACK 1
TURBO FAN SUPPLY AND HYD RESERV WATER TANK
PACK 2
WING ANTI ICE
PRECOOLER
FTIS
X BLEED VALVE
OVBD
APU BLEED VALVE
ENG 2 BLEED
O/PRESS VALVE
GROUND AIR SUPPLY
APU
ENG 1 STARTER
ENG 1 REVERSE
BLEED VALVE
FAN AIR VALVE
IP
HP
ENG 1 REVERSE
ENG 1

GENERAL

Ident.: DSC-36-10-20-00000840.0011001 / 20 MAR 17
Applicable to: LV-KHT, LV-KHU

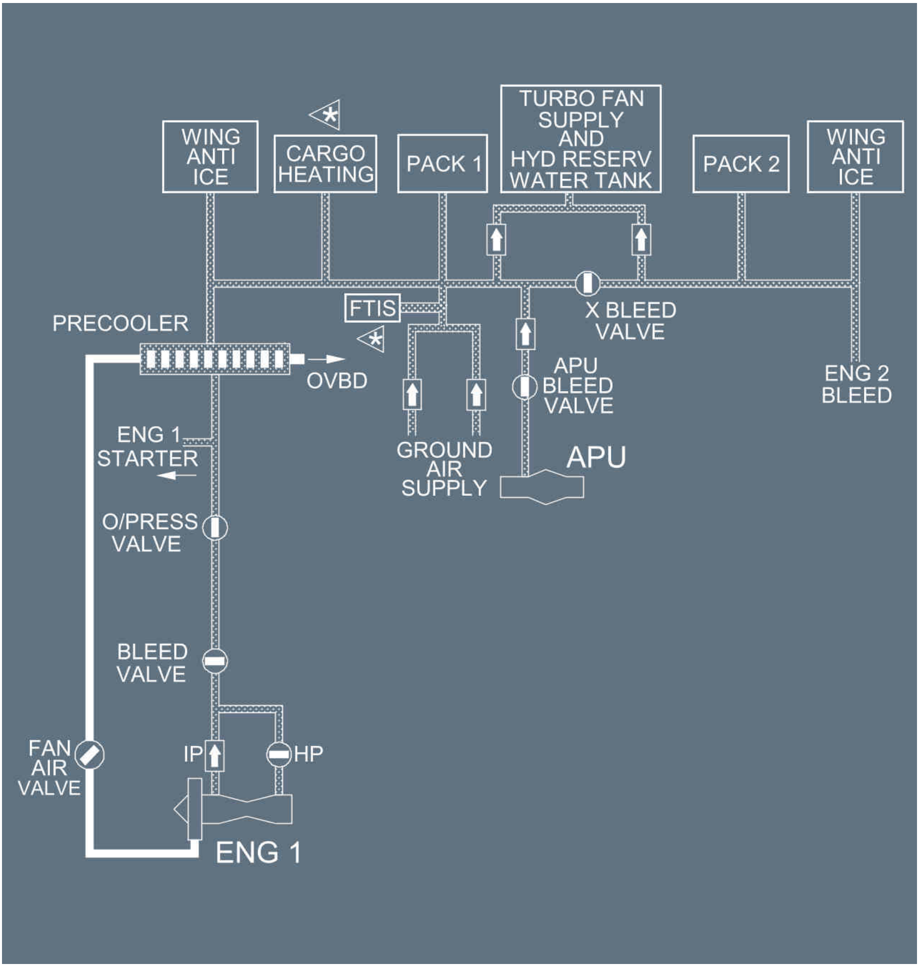
Engine bleed systems are similar

Each system is designed to:
- select the air source compressor stage
- regulate bleed air pressure
- regulate bleed air temperature

Each system is controlled and monitored by one Bleed Monitoring Computer.

Each BMC is provided with bleed pressure, temperature and valve position information, and is interconnected to:
- other systems involved with the bleed system
- the other BMC,

and provides indications and warnings to the ECAM and CMC.
In case of failure of one BMC, the other one takes over most of the monitoring functions.
The LH and RH bleed valves are electrically-controlled by BMC1 and BMC2 respectively, and are pneumatically -operated.


WING ANTI ICE
CARGO HEATING
PACK 1
TURBO FAN SUPPLY AND HYD RESERV WATER TANK
PACK 2
WING ANTI ICE
PRECOOLER
FTIS
X BLEED VALVE
OVBD
APU BLEED VALVE
ENG 2 BLEED
ENG 1 STARTER
GROUND AIR SUPPLY
APU
O/PRESS VALVE
BLEED VALVE
FAN AIR VALVE
IP
HP
ENG 1

ENGINE AIR SUPPLY

Ident.: DSC-36-10-20-00000845.0003001 / 09 OCT 12

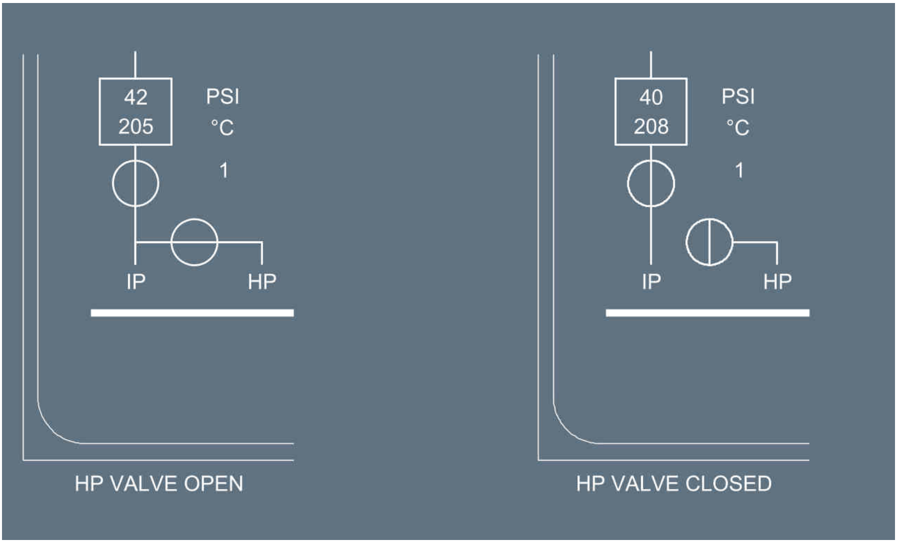
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Air is normally bled from the intermediate pressure stage (IP) of engine HP compressor, to minimize fuel penalty.

When pressure from the IP is not sufficient (low engine speed), air is bled from the high pressure (HP) stage thru the HP valve which limits downstream pressure to 36 ± 4 PSI.
An intermediate pressure check valve, mounted downstream of the IP port , closes to prevent air from HP stage being circulated to the IP stage.

L3 The HP valve is automatically closed
- pneumatically :
  - in case of low upstream pressure
  - in case of excessive upstream pressure
- electrically when :
  - the BLEED valve is electrically controlled closed or,
  - wing anti-ice is OFF and upstream HP valve pressure is > 73 PSI

L1 ECAM INDICATION



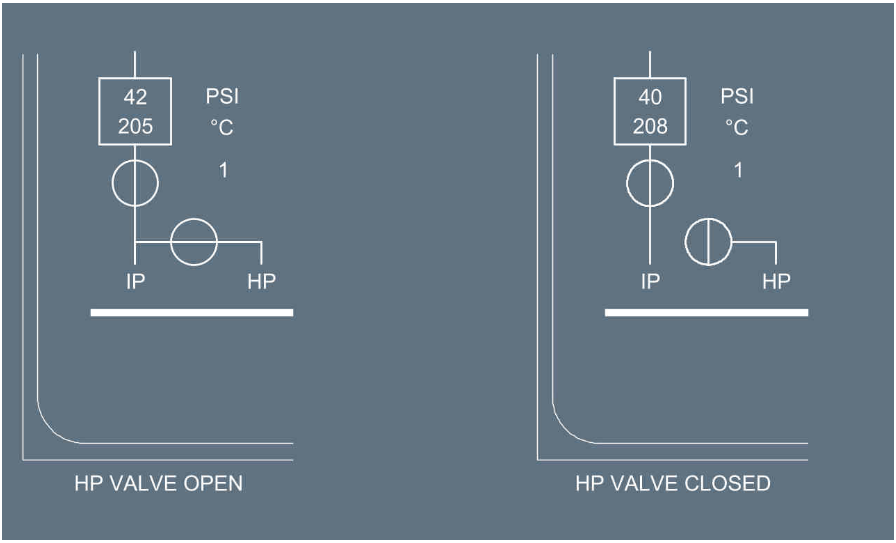
ENGINE AIR SUPPLY

Ident.: DSC-36-10-20-00000845.0004001 / 09 OCT 12
Applicable to: LV-KHT, LV-KHU

Air is normally bled from the intermediate pressure stage (IP) of engine HP compressor, to minimize fuel penalty.
When pressure from IP is not sufficient (low engine speed), air is bled from the high pressure (HP) stage thru the HP valve which limits downstream pressure to 40 ± 4 PSI .

Two intermediate pressure check valves, mounted downstream of each IP port, close to prevent air from HP stage being circulated to the IP stage.

ECAM INDICATION



PRESSURE REGULATION AND LIMITATION

Ident.: DSC-36-10-20-00000858.0003001 / 20 MAR 17
Applicable to: ALL

Downstream of the junction of HP and IP ducting, air is admitted into the bleed valve. This bleed valve acts as a shut-off, and as a Pressure Regulating Valve (PRV).
Delivery pressure is regulated between 44 and 52 PSI , depending on the flow.
The pressure can be reduced, in case of over temperature at the precooler inlet.
In case of a pressure regulation failure, the overpressure valve (OPV) closes, when the pressure is greater than 85 PSI.

The bleed valve is fully closed :
- Pneumatically in case of :
  - Upstream pressure less than 8 PSI, or
  - Engine fire
- Electrically through the:
  - BLEED pushbutton, when switched OFF
  - ENG FIRE pushbutton when pushed
  - BMC, in the following cases :
    - Overtemperature
    - Overpressure
    - Leak detection
    - APU bleed ON (for Engine 2, provided crossbleed valve is not closed).
    - Starting sequence
    - Engine shutdown

TEMPERATURE REGULATION AND LIMITATION

Ident.: DSC-36-10-20-00000861.0001001 / 21 MAR 16
Applicable to: ALL

The temperature regulation of bleed air is achieved by a precooler, that is mounted downstream of the bleed valve.
The precooler is an air-to-air heat exchanger, which uses cooling air that is bled from the engine fan, to regulate the temperature to 200 °C.
Fan airflow is controlled by the fan Air Valve.
When wing anti-ice is selected off, the temperature may be regulated to 150 °C, upon zone controller demand.
The fan air valve is spring-loaded closed, in the absence of pressure.

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GENERAL

Ident.: DSC-36-10-30-00000881.0001001 / 09 NOV 17
Applicable to: ALL

Air supplied by the APU load compressor is both available on ground and in flight.
APU bleed air is controlled by the APU bleed valve, which operates as shutoff valve. It is electrically-controlled and pneumatically-operated.
The APU bleed valve is controlled by the APU BLEED pushbutton, located on the AIR panel.
When, the pushbutton is set to ON, APU bleed air supplies the pneumatic system, provided APU N is greater than 95 %. This causes the crossbleed valve to open and the engine bleed valves to close.
If the APU bleed valve is opened, it automatically closes in the case of APU leak, left wing leak, or pylon 1 leak (except during engine start). *Refer to DSC-36-10-60 Leak Detection*.
A non-return valve, located near the crossbleed duct, protects the APU when air is bled from another supply source.

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HP GROUND AIR SUPPLY

Ident.: DSC-36-10-40-00000899.0001001 / 06 JUN 16
Applicable to: ALL

Air is supplied to the aircraft's pneumatic system via two HP ground connectors. The crossbleed valve has to be opened manually to provide air for both sides.

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GENERAL

Ident.: DSC-36-10-50-00000908.0004001 / 20 MAR 17
Applicable to: ALL

There is a crossbleed valve on the crossbleed duct. This valve enables the isolation or interconnection of LH (ENG1) and RH (ENG2) air supply system.

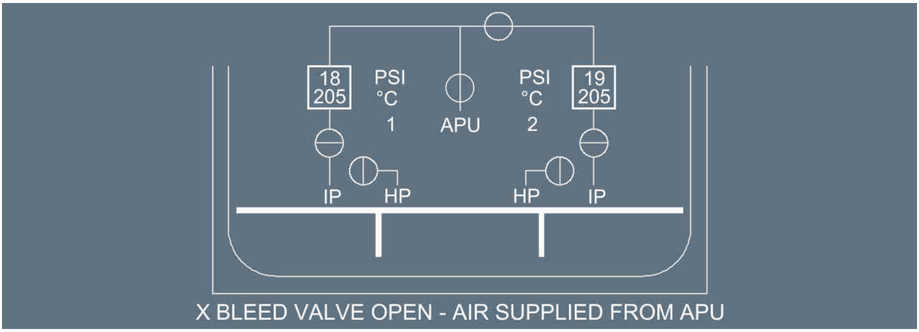
The crossbleed valve is electrically controlled from a rotary selector that is located on the overhead AIR panel.

Two electric motors control the crossbleed valve : One is for automatic mode, the other is for manual mode.

In automatic mode, the crossbleed valve is normally closed. It opens when APU bleed air is used. It closes, if the system detects an air leak (except during engine start). *Refer to DSC-36-10-60 Leak Detection*.

ECAM INDICATION

Ident.: DSC-36-10-50-00000903.0002001 / 09 OCT 12
Applicable to: ALL



X BLEED VALVE OPEN - AIR SUPPLIED FROM APU

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LEAK DETECTION

Ident.: DSC-36-10-60-00000912.0006001 / 20 MAR 17
Applicable to: LV-GKO, LV-GKP

The air leakage detection loops detect any ambient overheat in the vicinity of the hot air ducts in the fuselage, pylons and wings.
The sensing elements are tied to form a single loop, for pylon and APU, or, a double loop for the wing.
A wing leak signal is activated when the two loops detect a leak, or when one loop detects the leak and the other is inoperative.
The system has identical control logic included in each BMC.

- In case of wing leak signal
  - The engine bleed valve and HP valve on the affected wing are automatically closed.
  - The associated ENGINE BLEED FAULT light on the AIR panel are illuminated
  - The X-bleed valve automatically closes (except when manually selected open).
  - If the APU bleed valve is opened, and if the leak affects the left wing, the APU bleed valve automatically closes.
- In case of pylon leak signal
  - The bleed valves and the HP valves on the affected side are automatically closed
  - The FAULT light associated with the related engine is illuminated on the AIR panel
  - The X-bleed valve automatically closes (except during an engine start or manually selected open).
  - If the APU bleed valve is opened, and if the leak affects pylon 1, the APU bleed valve automatically closes (except during engine start).
- In case of APU leak signal
  - The APU bleed valve automatically closes
  - The FAULT light illuminates on the APU BLEED pushbutton on the AIR panel.
  - The X-bleed valve automatically closes (except when manually selected open).
  - If the APU bleed valve is closed, the engine 1 bleed valve and engine 1 HP valve automatically close.

APU bleed leak detection is performed only by BMC 1.

LEAK DETECTION

Ident.: DSC-36-10-60-00000912.0007001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The air leakage detection loops detect any ambient overheat in the vicinity of the hot air ducts in the fuselage, pylons and wings.
The sensing elements are tied to form a single loop, for pylon or, a double loop for the wing and APU.

A wing or APU leak signal is activated when the two loops detect a leak, or when one loop detects the leak and the other is inoperative.
The system has identical control logic included in each BMC.

- In case of wing leak signal
  - The engine bleed valve and HP valve on the affected wing are automatically closed.
  - The associated ENGINE BLEED FAULT light on the AIR panel are illuminated
  - The X-bleed valve automatically closes (except when manually selected open).
  - If the APU bleed valve is opened, and if the leak affects the left wing, the APU bleed valve automatically closes.
- In case of pylon leak signal
  - The bleed valves and the HP valves on the affected side are automatically closed
  - The FAULT light associated with the related engine is illuminated on the AIR panel
  - The X-bleed valve automatically closes (except during an engine start or manually selected open).
  - If the APU bleed valve is opened, and if the leak affects pylon 1, the APU bleed valve automatically closes (except during engine start).
- In case of APU leak signal
  - The APU bleed valve automatically closes
  - The FAULT light illuminates on the APU BLEED pushbutton on the AIR panel.
  - The X-bleed valve automatically closes (except when manually selected open).
  - If the APU bleed valve is closed, the engine 1 bleed valve and engine 1 HP valve automatically close.

BMC FAILURE

Ident.: DSC-36-10-70-00000924.0004001 / 19 JAN 11
Applicable to: LV-GKO, LV-GKP

If one BMC is failed the other BMC takes over monitoring of the bleed system and ensures the following ECAM warnings:
- ENG BLEED FAULT (overpressure and overtemperature only)
- WING LEAK
- BLEED LO TEMP (if wing anti ice is on)

Nevertheless the associated FAULT light on the AIR panel is lost, and the bleed valve does not close automatically.
ENG BLEED LEAK warning is lost for the associated engine as well as APU BLEED LEAK warning if BMC1 is concerned.

BMC FAILURE

Ident.: DSC-36-10-70-00000924.0005001 / 19 JAN 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

If one BMC is failed the other BMC takes over monitoring of the bleed system and ensures the following ECAM warnings:
- ENG BLEED FAULT (overpressure and overtemperature only)
- WING LEAK
- APU BLEED LEAK
- BLEED LO TEMP (if wing anti ice is on)

Nevertheless the associated FAULT light on the AIR panel is lost, and the bleed valve does not close automatically.
ENG BLEED LEAK warning is lost for the associated engine.

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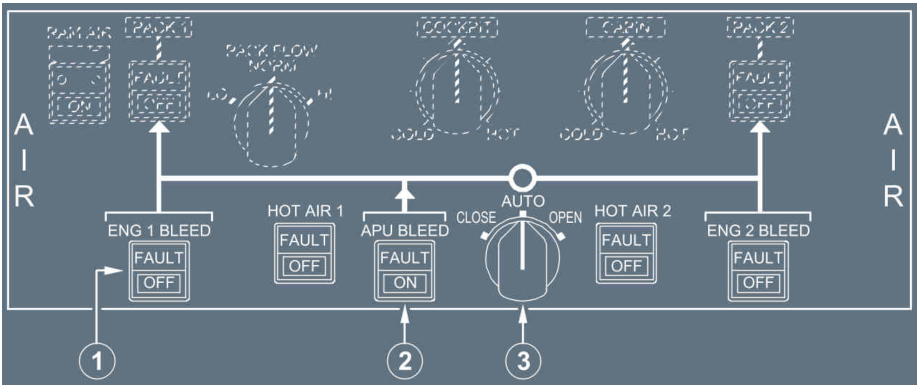
OVERHEAD PANEL

Ident.: DSC-36-20-00000692.0004001 / 09 NOV 17
Applicable to: ALL


RAM AIR
ON
PACK 1
FAULT
OFF
PACK FLOW
NORM
LO
HI
COCKPIT
COLD
HOT
CABIN
COLD
HOT
PACK 2
FAULT
OFF
AIR
AIR
ENG 1 BLEED
FAULT
OFF
HOT AIR 1
FAULT
OFF
APU BLEED
FAULT
ON
CLOSE
AUTO
OPEN
HOT AIR 2
FAULT
OFF
ENG 2 BLEED
FAULT
OFF
1
2
3

(1) ENG 1 (2) BLEED pb sw

On : The bleed valve opens, provided:
- Upstream pressure is above 8 PSI.
- The APU BLEED pb-sw is OFF, or the APU bleed valve is closed.
- There is no onside wing or pylon leak, overpressure, or overtemperature detected.
- The ENG FIRE pushbutton is not released out
- The ENG start valve is closed.

FAULT lt : illuminates amber, associated with ECAM caution, in case of:
- Bleed valve is not closed during engine start
- Bleed valve is not closed with APU bleed ON (and for RH engine X-bleed open).

and additionally associated with autoclosure of the bleed and HP valves:
- Overpressure downstream of the bleed valve.
- Bleed overheat
- Wing or pylon leak on the related side.

It goes off, when the ENG BLEED pushbutton is OFF, provided the failure has disappeared.

OFF : The Bleed valve and HP valve close. OFF light comes on white. The FAULT light and the autoclosure signal are reset.

(2) APU BLEED pb sw

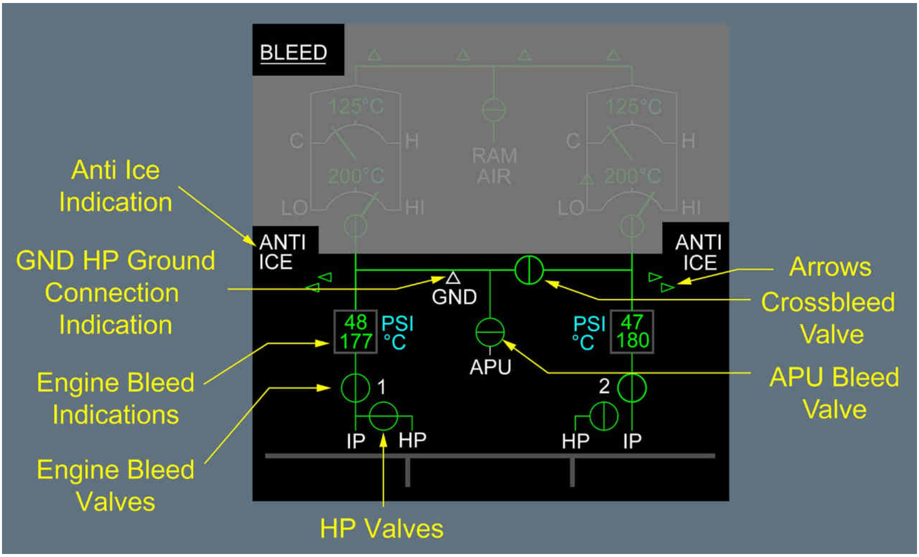
ON	:	APU valve opens provided: - N > 95 % - Altitude < 25 000 ft climbing or < 23 000 ft descending - No leak detected on APU or LH bleed (Should a leak occur on the RH side, the X-bleed would close). ON light illuminates blue.
Off	:	APU valves closes.
FAULT lt	:	illuminates amber, associated with ECAM caution, when APU leak is detected.

(3) X-BLEED sel

AUTO	:	X-bleed valve is open if APU bleed valve is open X-bleed valve is closed if APU bleed valve is closed.
OPEN	:	X-bleed valve is open.
CLOSE	:	X-bleed valve is closed.

BLEED SD PAGE

Ident.: DSC-36-20-00001042.0005001 / 10 MAY 21
Applicable to: ALL


BLEED
125°C
C
H
RAM AIR
125°C
C
H
200°C
LO
HI
200°C
LO
HI
ANTI ICE
ANTI ICE
GND
48
177
PSI
°C
PSI
°C
47
180
APU
1
2
IP
HP
HP
IP
Anti Ice Indication
GND HP Ground Connection Indication
Engine Bleed Indications
Engine Bleed Valves
HP Valves
Arrows
Crossbleed Valve
APU Bleed Valve

HP VALVES

Crossline - Green : The HP valve is fully closed.

In line - Green : The HP valve is not fully closed.

Crossline - Amber : The HP valve disagrees in the fully closed position, or
The HP valve is fully closed and the associated engine is not running, or
The HP valve is fully closed and the associated ENG BLEED pb-sw is OFF.

In line - Amber : The HP valve is not fully closed and the associated engine is not running, or
The HP valve is not fully closed and the associated ENG BLEED pb-sw is OFF.

ENGINE BLEED VALVES

In line - Green : The bleed valve is normally open.

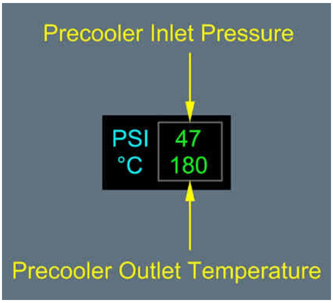
Crossline - Green : The bleed valve is fully closed (by manual or automatic control).

In line - Amber : The bleed valve disagrees in the open position.

Crossline - Amber : The bleed valve disagrees in the closed position, or
The bleed valve is fully closed and the associated engine is not running.

Note: *In certain circumstances (such as different engine setting, or one minor bleed valve regulation drift), it is possible that one bleed valve on one side closes and will be indicated closed and green on the BLEED SD page. There is no operational impact on the bleed system, provided there is no associated "AIR ENG X BLEED FAULT" ECAM alert.*

ENGINE BLEED INDICATIONS



Precooler inlet pressure

It is normally in green.
It becomes amber, if lower than 4 PSI, or in case the BMC detects an overpressure (above 60 PSI).

Precooler outlet temperature

It is normally in green.
It becomes amber, if the BMC detects an overheat or low temperature.

Overheat: Temperature exceeds:
- 290 °C for more than 5 s, or
- 270 °C for more than 15 s, or
- 257 °C for more than 55 s.

Low temperature is detected (only in-flight), if the bleed temperature drops below 150 °C, the wing anti-ice is on, and the pressure regulating valve is in the open position. Low temperature may, however, only be due to low outside air temperature.

Note: *When the engines are at idle, and depending on the ambient temperature, the precooler outlet temperature may be below 150 °C (displayed in amber).*

APU BLEED VALVE

Displayed only if the APU MASTER SW is ON.

Crossline - Green : APU valve not fully open and APU BLEED pushbutton is OFF

Crossline - Amber : APU bleed valve is not fully open and APU BLEED pushbutton is ON.

In line - Green : APU valve fully open

CROSSBLEED VALVE

Crossline - Green : crossbleed valve is normally closed.

In line - Green : crossbleed valve is normally open.

Crossline - Amber : crossbleed valve disagrees in closed position.

In line - Amber : crossbleed valve disagrees in open position.

In transit - Amber : crossbleed valve in transit

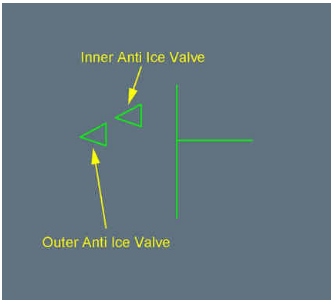
GND HP GROUND CONNECTION INDICATION

△ GND : displayed in white on the ground

ANTI ICE INDICATION

Displayed in white, if the WING pushbutton on the ANTI ICE panel is ON and both valves on the related side are open. The associated anti ice indication becomes amber if:
- the position of at least one valve of the related side disagrees with the anti ice selection
- at least one arrow symbol is amber on the related side.

ARROWS



ARROW DISPLAY	
Not displayed	Valve is closed.
Green	Valve is normally open.
Amber	Valve is open, and at least one of the following conditions is met: - Bleed air pressure high, or low - Wing anti-ice pushbutton is at OFF position - Open for more than 35 s, while the aircraft is on ground.

MEMO DISPLAY

Ident.: DSC-36-20-00017082.0001001 / 21 MAR 16
Applicable to: ALL

APU BLEED : This memo appears in green, if the APU is available and the APU BLEED pb-sw is ON.

Intentionally left blank

AIRCRAFT SYSTEMS

WATER / WASTE

Intentionally left blank

DSC-38-10 Description

General....A
Potable Water....B
Wastewater System....C
Toilet System....D
Architecture....E

Intentionally left blank

GENERAL

Ident.: DSC-38-10-00017388.0001001 / 21 MAR 16
Applicable to: ALL

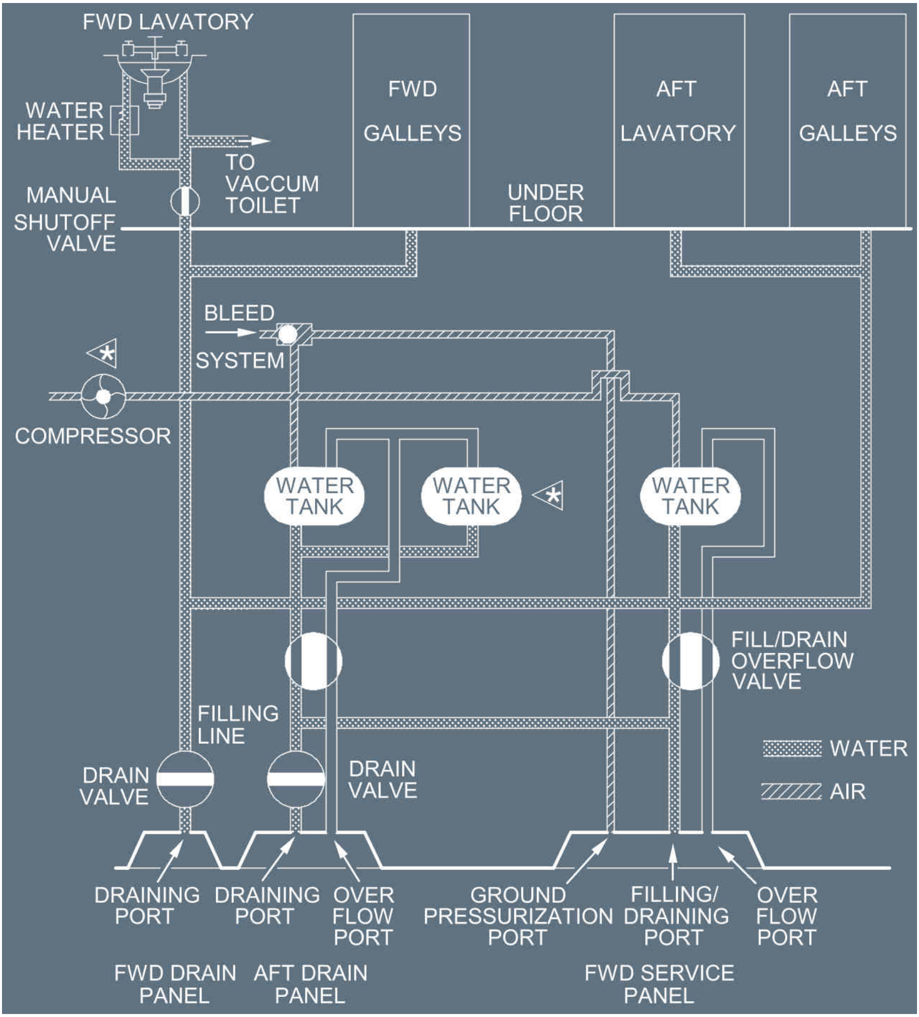
The water and waste systems:
- Distribute potable water to the toilets and the galleys
- Dispose waste water
- Store toilet wastes.

The system is insulated to prevent water leaks and ice build up.
The water and waste control panel is located on the Forward Attendant Panel (FAP).

POTABLE WATER

Ident.: DSC-38-10-00017389.0001001 / 21 MAR 16
Applicable to: ALL

Potable water is stored in two 350 l water tanks (or three 350 l water tanks ◁✻) located in the aft cargo compartment, in sidewalls.
On ground, the water system is pressurized by the air from the service panel pressure port. In flight, the water system is pressurized by bleed air.
If bleed air is not available and the air pressure is not sufficient for the normal operation of the potable water system, an electrical compressor ◁✻ starts automatically.
Potable water is piped to the galleys and lavatories. Manual shutoff valves isolate the washbasins and toilets from the water system. The manual shutoff valves are located behind an access door, under the toilet bowl. The position of each valve is indicated by OPEN and SHUT legend. A placard inside the access door gives instructions on the operation of the manual shutoff valve.
The system can be filled or drained from the service panel at the bottom of the fuselage. For tank filling, the quantity of the potable water is preselected on the FAP.
The indication of the water quantity in the tanks is displayed on the FAP.


FWD LAVATORY
WATER HEATER
TO VACCUM TOILET
MANUAL SHUTOFF VALVE
FWD GALLEYS
UNDER FLOOR
AFT LAVATORY
AFT GALLEYS
BLEED
SYSTEM
COMPRESSOR
WATER TANK
WATER TANK
WATER TANK
FILL/DRAIN OVERFLOW VALVE
FILLING LINE
DRAIN VALVE
DRAIN VALVE
WATER
AIR
DRAINING PORT
DRAINING PORT
OVER FLOW PORT
GROUND PRESSURIZATION PORT
FILLING/ DRAINING PORT
OVER FLOW PORT
FWD DRAIN PANEL
AFT DRAIN PANEL
FWD SERVICE PANEL

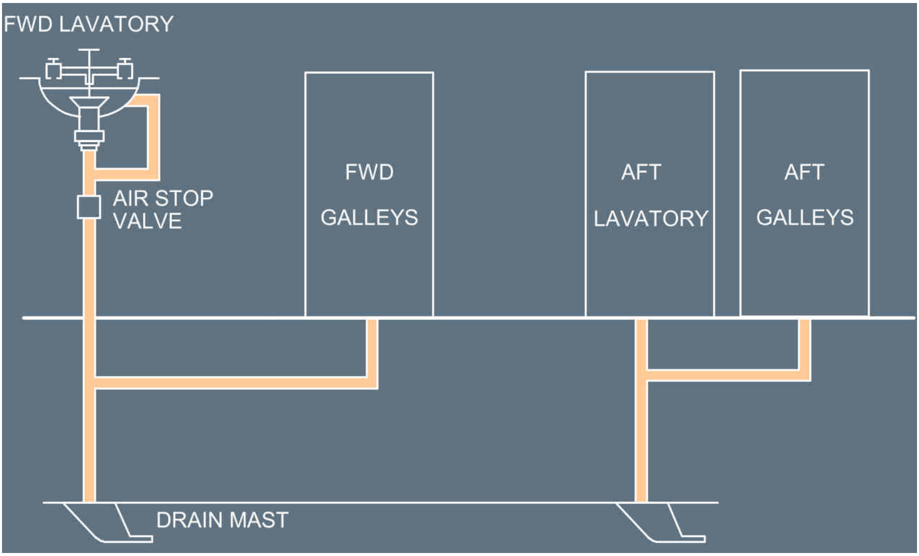
WASTEWATER SYSTEM

Ident.: DSC-38-10-00017390.0001001 / 21 MAR 16
Applicable to: ALL

The waste/water (from galleys and lavatories) drains overboard through two heated drain masts.

The forward mast drains the waste/water from the forward cabin. The aft mast drains the waste/water from the aft cabin.

The waste and water are discharged by:
- Gravity, on ground
- Differential pressure, in flight.



TOILET SYSTEM

Ident.: DSC-38-10-00017391.0001001 / 03 NOV 22
Applicable to: ALL

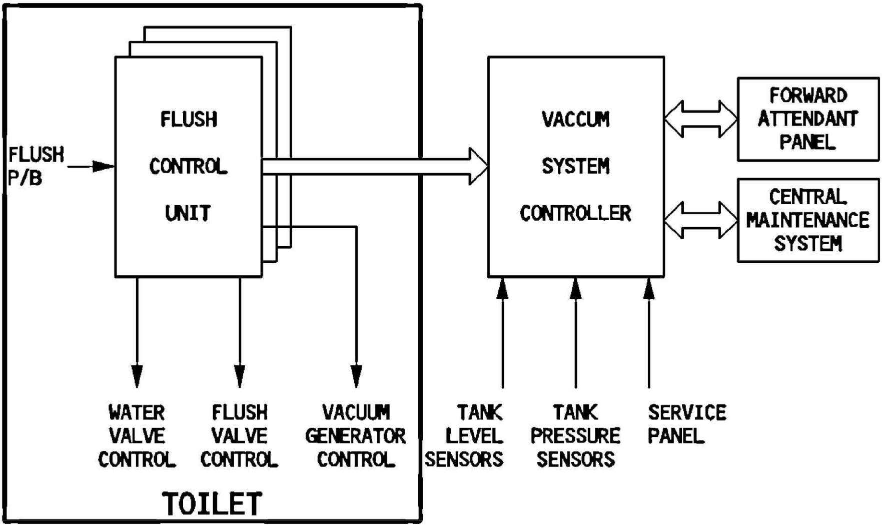
The aircraft has a vacuum toilet system for the toilets and the 2 waste storage tanks (or 1 waste storage tank ◁ , or 3 waste storage tanks ◁).
The total capacity for the 2 waste storage tanks is 676 l (or 750 l for 1 waste storage tank ◁ , or 1 014 l for 3 waste storage tanks ◁).
In flight, differential pressure forces waste from the toilet into the waste storage tanks.
On ground and at low flight altitude (below 16 000 ft), each waste storage tank has a vacuum generator that provides the necessary differential pressure.
Clean water from the potable water system flushes the toilets.
A flush control unit controls the flush sequence in each toilet.
The vacuum system controller (VSC) ensures the system control, monitoring and fault reporting.

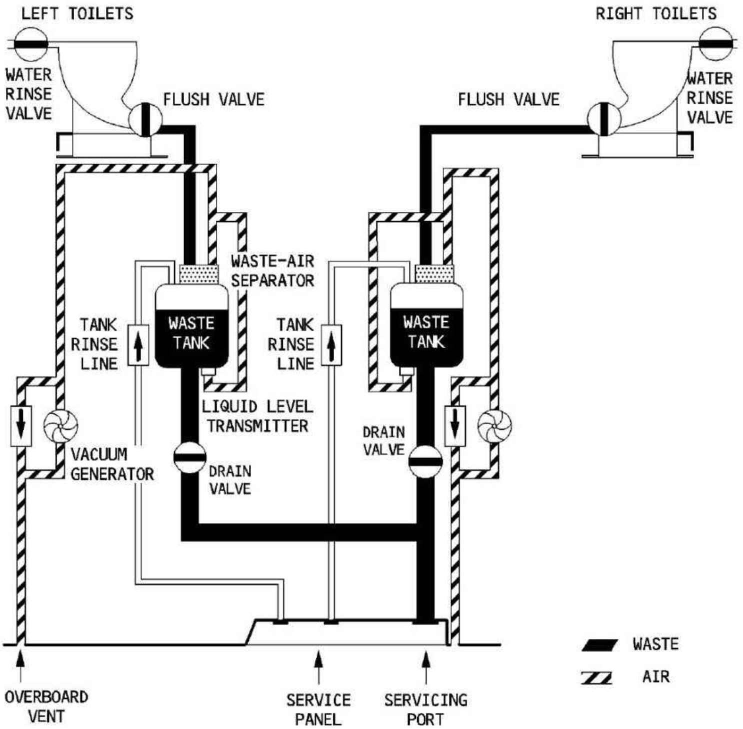
The VSC transmits information to:
- The FAP to indicate the waste tank levels and report system defects
- The centralized fault display system to indicate the system defects to the maintenance.

Ground personnel services the waste tanks via a service panel, located under the fuselage.
A manual shutoff valve isolates an inoperative toilet. The manual shutoff valve is located on the right side of each toilet bowl.

ARCHITECTURE

Ident.: DSC-38-10-00000918.0004001 / 15 FEB 11
Applicable to: ALL


FLUSH P/B
FLUSH CONTROL UNIT
VACCUM SYSTEM CONTROLLER
FORWARD ATTENDANT PANEL
CENTRAL MAINTENANCE SYSTEM
WATER VALVE CONTROL
FLUSH VALVE CONTROL
VACUUM GENERATOR CONTROL
TANK LEVEL SENSORS
TANK PRESSURE SENSORS
SERVICE PANEL
TOILET


LEFT TOILETS
RIGHT TOILETS
WATER RINSE VALVE
FLUSH VALVE
FLUSH VALVE
WATER RINSE VALVE
WASTE-AIR SEPARATOR
TANK RINSE LINE
WASTE TANK
TANK RINSE LINE
WASTE TANK
LIQUID LEVEL TRANSMITTER
DRAIN VALVE
VACUUM GENERATOR
DRAIN VALVE
WASTE
AIR
OVERBOARD VENT
SERVICE PANEL
SERVICING PORT

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AIRCRAFT SYSTEMS

MAINTENANCE SYSTEM

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DSC-45-10 Description

General....A
Components....B
Modes of Operation....C
Architecture....D
Failure Classification....E
CMS Functions....F
Cockpit / CMS Interface....G

DSC-45-20 System Operation

MAINTENANCE MENU....A
POST OR CURRENT FLIGHT REPORT....B
PREVIOUS FLIGHT REPORT....C
AVIONICS STATUS....D
CLASS 3 REPORT....E
SYSTEM REPORT/TEST....F
UTC/DATE INIT....G
CMC RECONFIGURATION....H

DSC-45-30 Data Loader

Description....A

DSC-45-35 Printer

Description....A
Controls and Indicators....B

Intentionally left blank

GENERAL

Ident.: DSC-45-10-00000926.0001001 / 21 MAR 16
Applicable to: ALL

The purpose of the Central Maintenance System (CMS) is to ease the maintenance task by directly indicating, in the cockpit, the fault messages and allowing some specific tests.

Two levels of maintenance are possible :
At the line stop : Equipment removal
At the main base : Troubleshooting

COMPONENTS

Ident.: DSC-45-10-00000928.0002001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

The CMS includes :
- The Built In Test Equipment (BITE) of all electronic systems
- Two fully redundant Central Maintenance Computers (CMCs)
- Three MCDUs (Multipurpose Control Display Units) used also for FMGS, ACMS (Aircraft Condition Monitoring System) and ATSU (Air Traffic Service Unit), which dialogue with the CMC for display of information or initiation of tests
- One printer (A4 format)

Usually only CMC 1 is used, when CMC 2 is in standby. CMC 2 will automatically take over if CMC 1 fails.
A pushbutton on the overhead panel allows to force the transfer to CMC 2, by setting the CMC 1 to OFF.

COMPONENTS

Ident.: DSC-45-10-00000928.0003001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

The CMS includes :
- The Built In Test Equipment (BITE) of all electronic systems
- One Central Maintenance Computer (CMC)
- Three MCDUs (Multipurpose Control Display Units) used also for FMGS, ACMS (Aircraft Condition Monitoring System) and ATSU (Air Traffic Service Unit), which dialogue with the CMC for display of information or initiation of tests
- One printer (A4 format)

MODES OF OPERATION

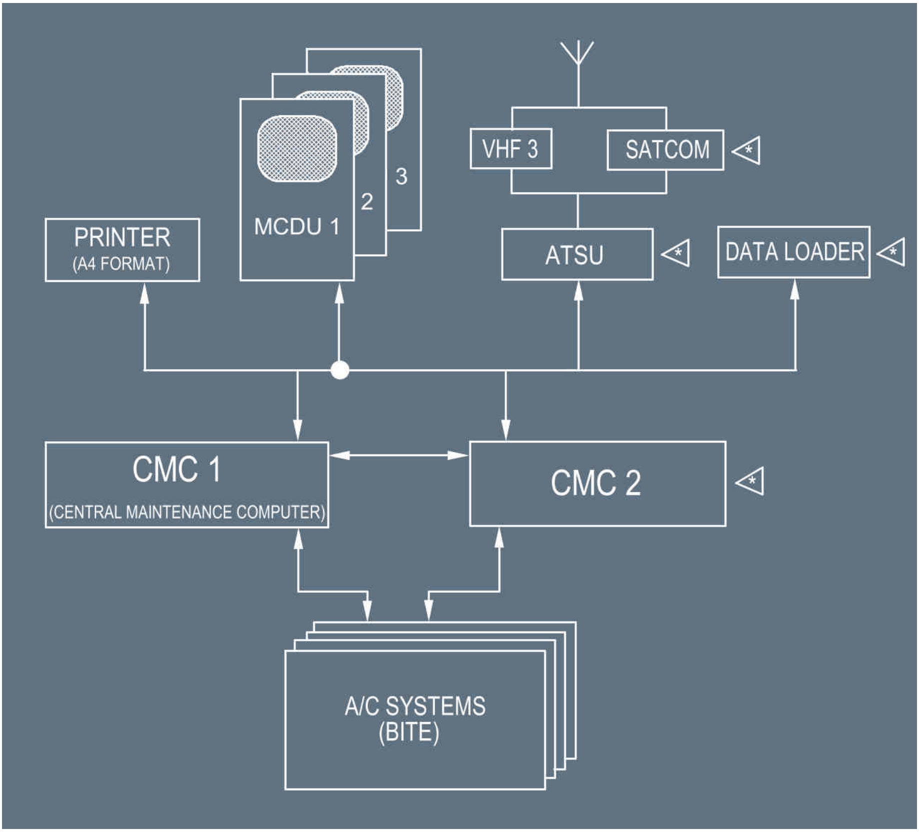
Ident.: DSC-45-10-00000938.0001001 / 21 MAR 16
Applicable to: ALL

The CMS operates in two main modes :
- The NORMAL mode or REPORTING mode in flight
- The INTERACTIVE mode or MENU mode on ground

In NORMAL mode, the CMS records and displays the failure messages permanently transmitted by each system BITE.
In INTERACTIVE mode, the CMS enables the connection of any BITE system with the MCDU, in order to display the maintenance data stored and formated by the system BITE, or to initiate a TEST.

ARCHITECTURE

Ident.: DSC-45-10-00017146.0001001 / 21 MAR 16
Applicable to: ALL


MCDU 1
2
3
VHF 3
SATCOM
PRINTER
(A4 FORMAT)
ATSU
DATA LOADER
*
CMC 1
(CENTRAL MAINTENANCE COMPUTER)
CMC 2
A/C SYSTEMS
(BITE)

FAILURE CLASSIFICATION

Ident.: DSC-45-10-00000970.0001001 / 16 NOV 11

Applicable to: ALL

There are three classes of failure:

Class 1 :	Failures indicated to the flight crew by means of a flight deck effect (e.g. ECAM or instrument flags).
Class 2 :	Failures which can be left uncorrected until the next scheduled maintenance check (Management of these failures is handled by the Trouble Shooting Manual (TSM) and should be rectified within the timescale defined in the TSM).
Class 3 :	Failures not indicated to the flight crew, with no fixed time quoted for correction.

Failure Classes	Class 1	Class 2	Class 3
Operational consequences	YES	NO	NO
Indication to the flight crew	YES Automatically displayed in real time: - Warning or caution messages on Engine Warning Display - Flags on Primary Flight Display or Navigation Display, or System Display, - Local warning	*Refer to MEL/MI-00-08 ECAM and MAINTENANCE STATUS*	NO
Dispatch consequences	Refer to MEL may be: - ”GO” - ”GO IF” - ”NO GO”	MEL not applicable. “GO” without conditions. These failures should be rectified within the timescale defined in the TSM.	MEL not applicable. No fixed time quoted for corrections. However, correction is recommended to improve dispatch reliability.
Indication to the maintenance team	YES Automatically print out at the end of each flight : Failure messages on the CMC Post Flight Report		YES On request, when needed, Failure messages on CMC Class 3 Report.

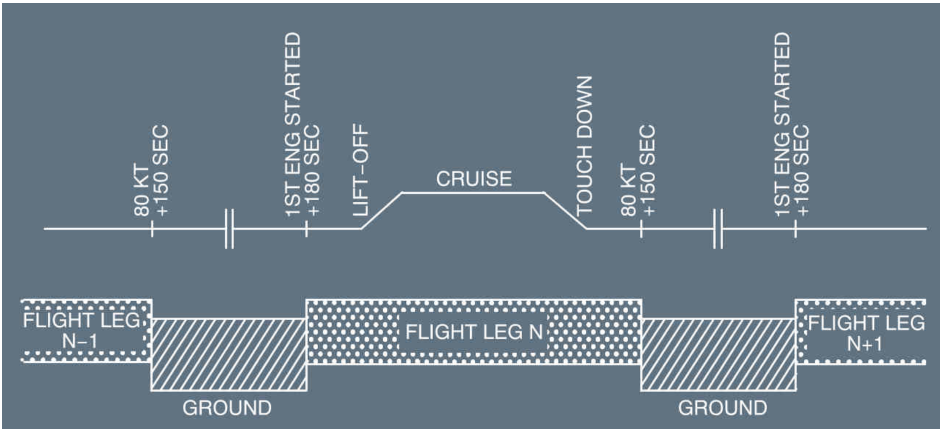
Note: *Most Class 1 failures have an operational consequence on the current flight. Some Class 1 failures, such as MINOR FAULT, have no operational consequence on the current flight, but must be corrected in accordance with the MEL preamble, or the time specified in the associated dispatch condition of the MEL.*

CMS FUNCTIONS

Ident.: DSC-45-10-00000973.0004001 / 22 MAR 16
Applicable to: ALL

The main CMS functions are the :

- Acquisition and storage of messages transmitted by the connected system BITEs, or by the Flight Warning Computer (Warning / Caution titles).
- Elaboration of the maintenance phases.

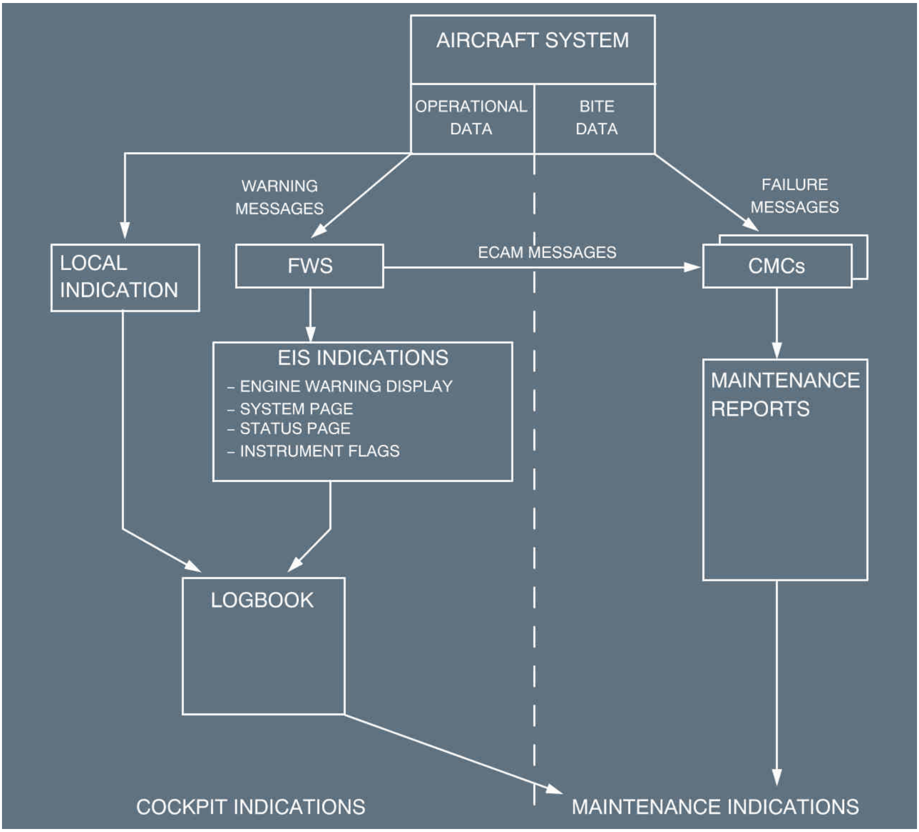

80 KT +150 SEC
1ST ENG STARTED +180 SEC
LIFT–OFF
CRUISE
TOUCH DOWN
80 KT +150 SEC
1ST ENG STARTED +180 SEC
FLIGHT LEG N–1
FLIGHT LEG N
FLIGHT LEG N+1
GROUND
GROUND

- Elaboration of the maintenance reports :
  - POST OR CURRENT FLIGHT REPORT :
    Presents all ECAM warning/caution and failure messages (Class 1 and 2 failures) recorded during the last or current flight leg.
    Available in flight and on ground.
  - PREVIOUS FLIGHT REPORT :
    Presents all ECAM and failure messages recorded during the 63 previous flight legs (post flight reports).
    Available on ground only.
  - AVIONICS STATUS :
    Presents, in real time, the systems affected by a failure.
    Available in flight and on ground.
  - CLASS 3 REPORT :
    Presents the Class 3 failure messages detected during the last flight leg.
    Available on ground only.
  - SYSTEM REPORT/TEST :
    Allows interactive dialogue between any system and the MCDU.

Available on ground only..

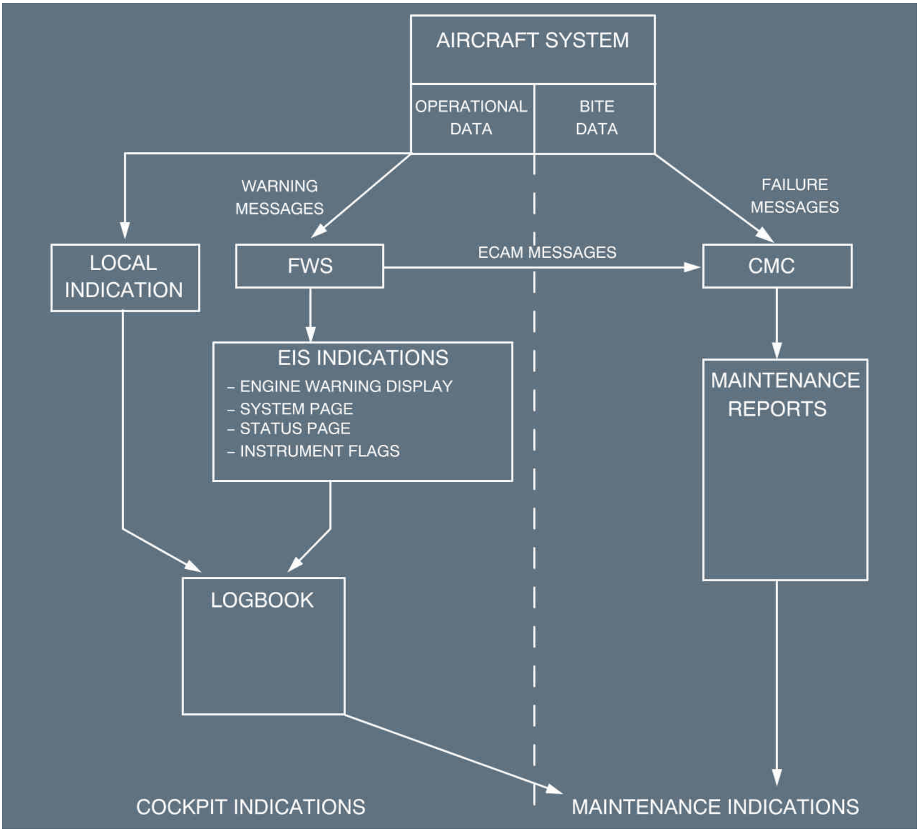
COCKPIT / CMS INTERFACE

Ident.: DSC-45-10-00000975.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO


AIRCRAFT SYSTEM
OPERATIONAL DATA
BITE DATA
WARNING MESSAGES
FAILURE MESSAGES
LOCAL INDICATION
FWS
ECAM MESSAGES
CMCs
EIS INDICATIONS
– ENGINE WARNING DISPLAY
– SYSTEM PAGE
– STATUS PAGE
– INSTRUMENT FLAGS
MAINTENANCE REPORTS
LOGBOOK
COCKPIT INDICATIONS
MAINTENANCE INDICATIONS

COCKPIT / CMS INTERFACE

Ident.: DSC-45-10-00000975.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU


AIRCRAFT SYSTEM
OPERATIONAL DATA
BITE DATA
WARNING MESSAGES
FAILURE MESSAGES
LOCAL INDICATION
FWS
ECAM MESSAGES
CMC
EIS INDICATIONS
– ENGINE WARNING DISPLAY
– SYSTEM PAGE
– STATUS PAGE
– INSTRUMENT FLAGS
MAINTENANCE REPORTS
LOGBOOK
COCKPIT INDICATIONS
MAINTENANCE INDICATIONS

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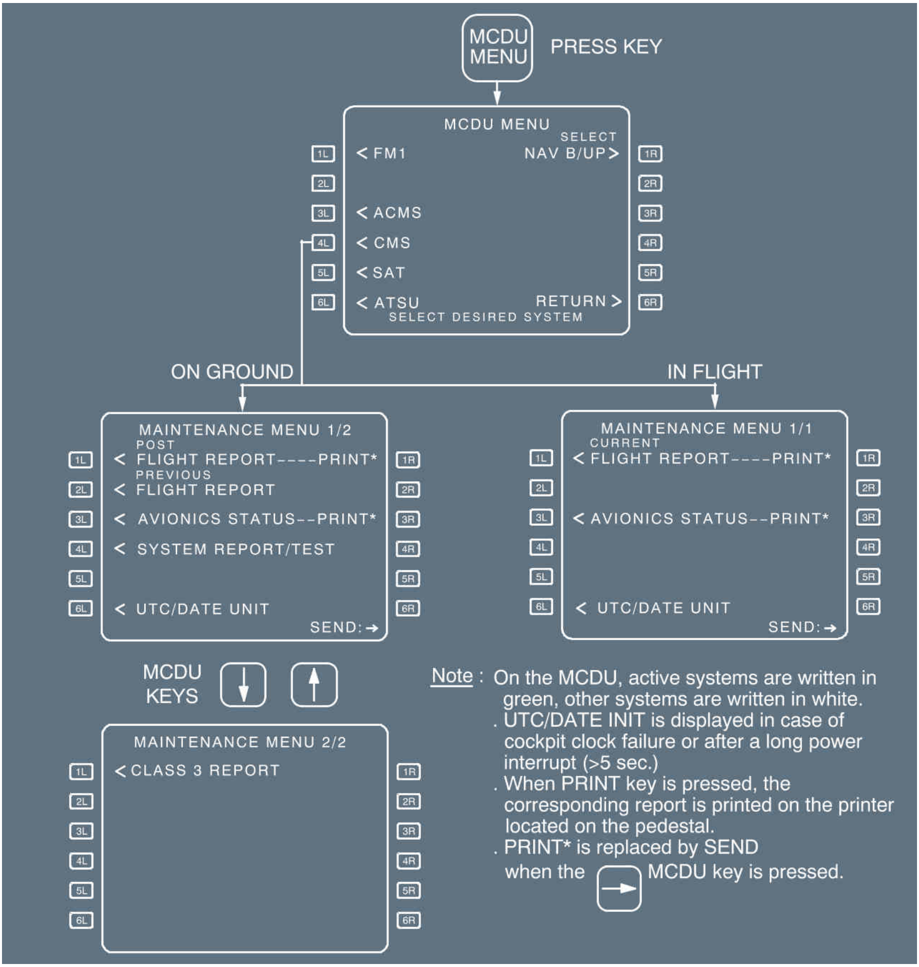
MAINTENANCE MENU

Ident.: DSC-45-20-00000983.0002001 / 22 MAR 16
Applicable to: ALL

The CMS uses menus displayed on the MCDU. The operator chooses the functions or reports via these menus.
Pressing the “MCDU MENU” key and then selecting CMS gives access to the MAINTENANCE MENU page. These pages are different in flight and on ground.


MCDU MENU
PRESS KEY
MCDU MENU
SELECT
< FM1
NAV B/UP >
< ACMS
< CMS
< SAT
< ATSU
RETURN >
SELECT DESIRED SYSTEM
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
ON GROUND
IN FLIGHT
MAINTENANCE MENU 1/2
POST
< FLIGHT REPORT----PRINT*
PREVIOUS
< FLIGHT REPORT
< AVIONICS STATUS--PRINT*
< SYSTEM REPORT/TEST
< UTC/DATE UNIT
SEND:→
MAINTENANCE MENU 1/1
CURRENT
< FLIGHT REPORT----PRINT*
< AVIONICS STATUS--PRINT*
< UTC/DATE UNIT
SEND:→
MCDU KEYS
MAINTENANCE MENU 2/2
< CLASS 3 REPORT

Note : On the MCDU, active systems are written in green, other systems are written in white.

. UTC/DATE INIT is displayed in case of cockpit clock failure or after a long power interrupt (>5 sec.)

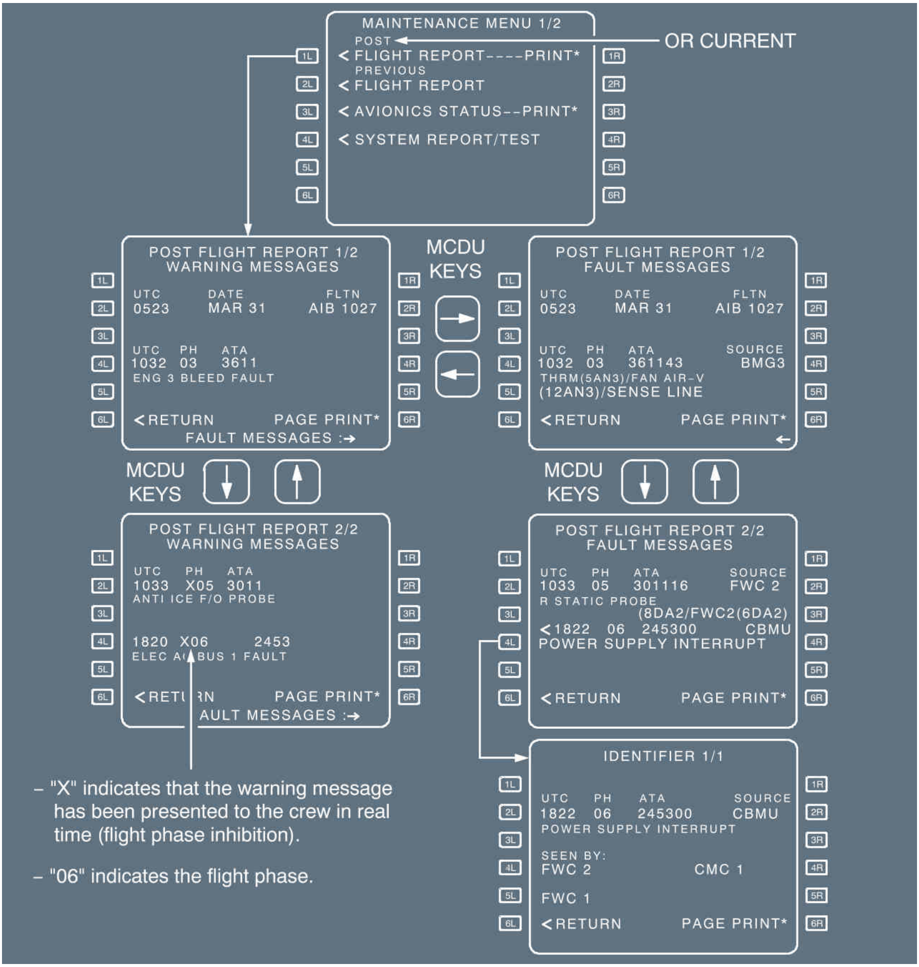
. When PRINT key is pressed, the corresponding report is printed on the printer located on the pedestal.

. PRINT* is replaced by SEND when the → MCDU key is pressed.

POST OR CURRENT FLIGHT REPORT

Ident.: DSC-45-20-00000988.0003001 / 19 DEC 12
Applicable to: ALL

POST FLIGHT REPORT on ground or CURRENT FLIGHT REPORT in flight, presents all class 1 and 2 failures and all system failure messages received by the CMS during the last flight leg or current leg.



```
MAINTENANCE MENU 1/2
POST
< FLIGHT REPORT----PRINT*
PREVIOUS
< FLIGHT REPORT
< AVIONICS STATUS--PRINT*
< SYSTEM REPORT/TEST
```

```
POST FLIGHT REPORT 1/2
WARNING MESSAGES
UTC      DATE         FLTN
0523     MAR 31       AIB 1027

UTC   PH   ATA
1032  03   3611
ENG 3 BLEED FAULT

<RETURN          PAGE PRINT*
     FAULT MESSAGES :→
```

```
POST FLIGHT REPORT 1/2
FAULT MESSAGES
UTC      DATE         FLTN
0523     MAR 31       AIB 1027

UTC   PH   ATA          SOURCE
1032  03   361143        BMG3
THRM(5AN3)/FAN AIR-V
(12AN3)/SENSE LINE
<RETURN          PAGE PRINT*
                           ←
```

```
POST FLIGHT REPORT 2/2
WARNING MESSAGES
UTC   PH   ATA
1033  X05  3011
ANTI ICE F/O PROBE


1820  X06       2453
ELEC A  BUS 1 FAULT

<RETURN          PAGE PRINT*
      AULT MESSAGES :→
```

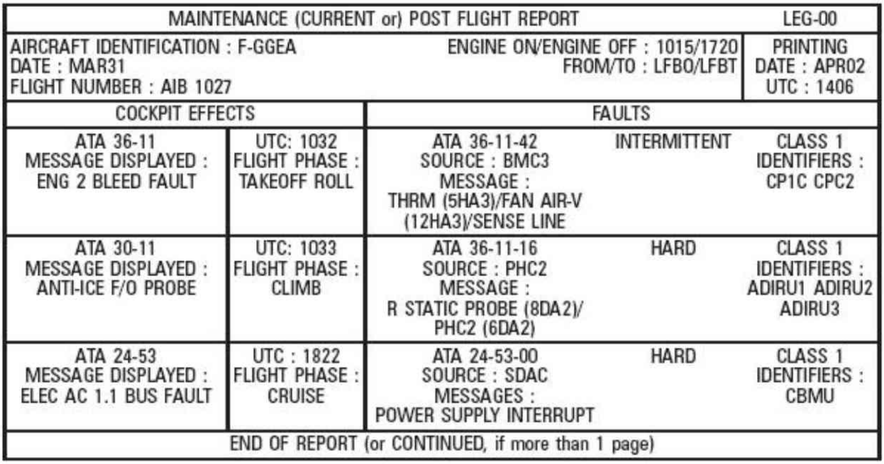
```
POST FLIGHT REPORT 2/2
FAULT MESSAGES
UTC   PH   ATA          SOURCE
1033  05   301116       FWC 2
R STATIC PROBE
            (8DA2/FWC2(6DA2)
<1822  06   245300      CBMU
POWER SUPPLY INTERRUPT

<RETURN          PAGE PRINT*
```

```
IDENTIFIER 1/1

UTC   PH   ATA          SOURCE
1822  06   245300       CBMU
POWER SUPPLY INTERRUPT

SEEN BY:
FWC 2                CMC 1

FWC 1
<RETURN          PAGE PRINT*
```

- "X" indicates that the warning message has been presented to the crew in real time (flight phase inhibition).
- "06" indicates the flight phase.

The POST or CURRENT FLIGHT REPORT is automatically printed after engine shutdown, or manually by selecting the PRINT key.
It is also automatically downlinked to the airline ground computer after engine shutdown, or manually by selecting SEND.

POST FLIGHT REPORT PRINT OUT

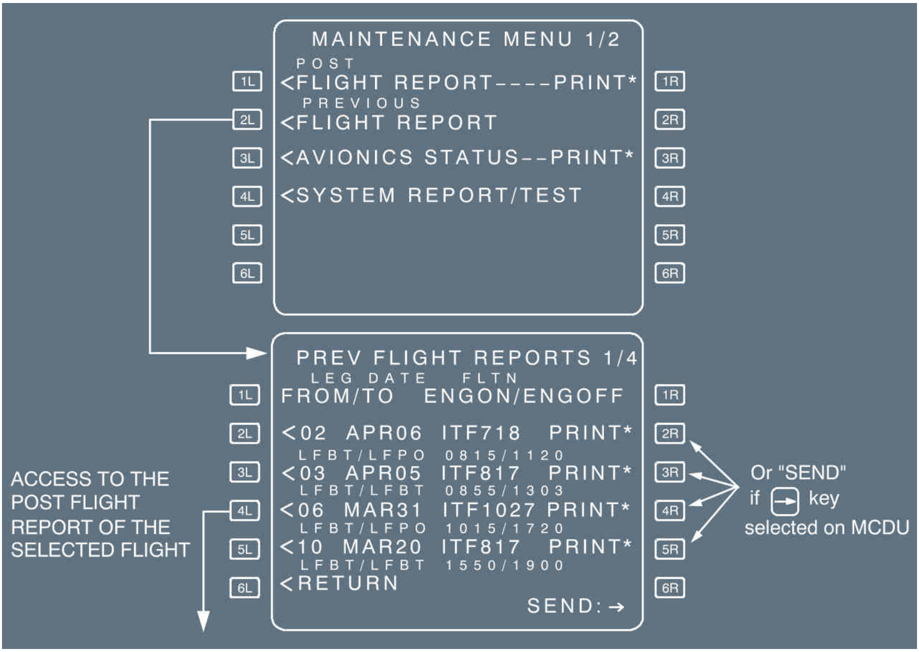


<table>
<tr><td colspan="4">MAINTENANCE (CURRENT or) POST FLIGHT REPORT</td><td>LEG-00</td></tr>
<tr><td colspan="2">AIRCRAFT IDENTIFICATION : F-GGEA
DATE : MAR31
FLIGHT NUMBER : AIB 1027</td><td colspan="2">ENGINE ON/ENGINE OFF : 1015/1720
FROM/TO : LFBO/LFBT</td><td>PRINTING
DATE : APR02
UTC : 1406</td></tr>
<tr><td colspan="2">COCKPIT EFFECTS</td><td colspan="3">FAULTS</td></tr>
<tr><td>ATA 36-11
MESSAGE DISPLAYED :
ENG 2 BLEED FAULT</td><td>UTC: 1032
FLIGHT PHASE :
TAKEOFF ROLL</td><td>ATA 36-11-42
SOURCE : BMC3
MESSAGE :
THRM (5HA3)/FAN AIR-V
(12HA3)/SENSE LINE</td><td>INTERMITTENT</td><td>CLASS 1
IDENTIFIERS :
CP1C CPC2</td></tr>
<tr><td>ATA 30-11
MESSAGE DISPLAYED :
ANTI-ICE F/O PROBE</td><td>UTC: 1033
FLIGHT PHASE :
CLIMB</td><td>ATA 36-11-16
SOURCE : PHC2
MESSAGE :
R STATIC PROBE (8DA2)/
PHC2 (6DA2)</td><td>HARD</td><td>CLASS 1
IDENTIFIERS :
ADIRU1 ADIRU2
ADIRU3</td></tr>
<tr><td>ATA 24-53
MESSAGE DISPLAYED :
ELEC AC 1.1 BUS FAULT</td><td>UTC : 1822
FLIGHT PHASE :
CRUISE</td><td>ATA 24-53-00
SOURCE : SDAC
MESSAGES :
POWER SUPPLY INTERRUPT</td><td>HARD</td><td>CLASS 1
IDENTIFIERS :
CBMU</td></tr>
<tr><td colspan="5">END OF REPORT (or CONTINUED, if more than 1 page)</td></tr>
</table>

PREVIOUS FLIGHT REPORT

Ident.: DSC-45-20-00001002.0003001 / 19 DEC 12
Applicable to: ALL

This report provides access to the POST FLIGHT REPORTS of the 63 previous flight legs.

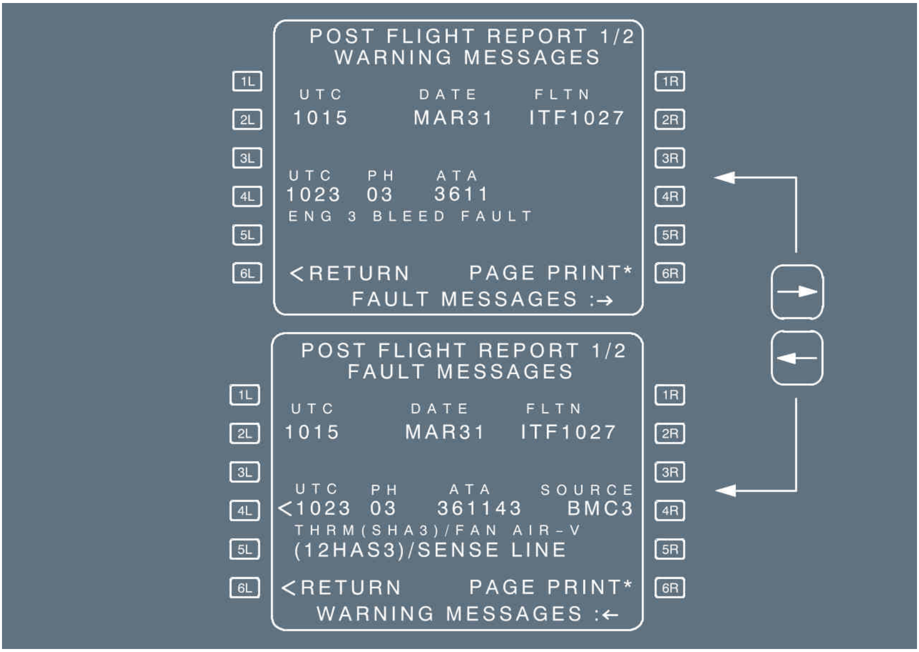


```
MAINTENANCE MENU 1/2
 POST
<FLIGHT REPORT----PRINT*
  PREVIOUS
<FLIGHT REPORT
<AVIONICS STATUS--PRINT*
<SYSTEM REPORT/TEST
```

```
 PREV FLIGHT REPORTS 1/4
   LEG DATE    FLTN
FROM/TO   ENGON/ENGOFF
<02  APR06  ITF718   PRINT*
  LFBT/LFPO  0815/1120
<03  APR05  ITF817   PRINT*
  LFBT/LFBT  0855/1303
<06  MAR31  ITF1027 PRINT*
  LFBT/LFPO  1015/1720
<10  MAR20  ITF817   PRINT*
  LFBT/LFBT  1550/1900
<RETURN
                  SEND:→
```

ACCESS TO THE POST FLIGHT REPORT OF THE SELECTED FLIGHT

Or "SEND" if → key selected on MCDU



```
POST FLIGHT REPORT 1/2
WARNING MESSAGES
UTC         DATE     FLTN
1015        MAR31    ITF1027

UTC  PH   ATA
1023 03   3611
ENG 3 BLEED FAULT

<RETURN        PAGE PRINT*
FAULT MESSAGES :→
```

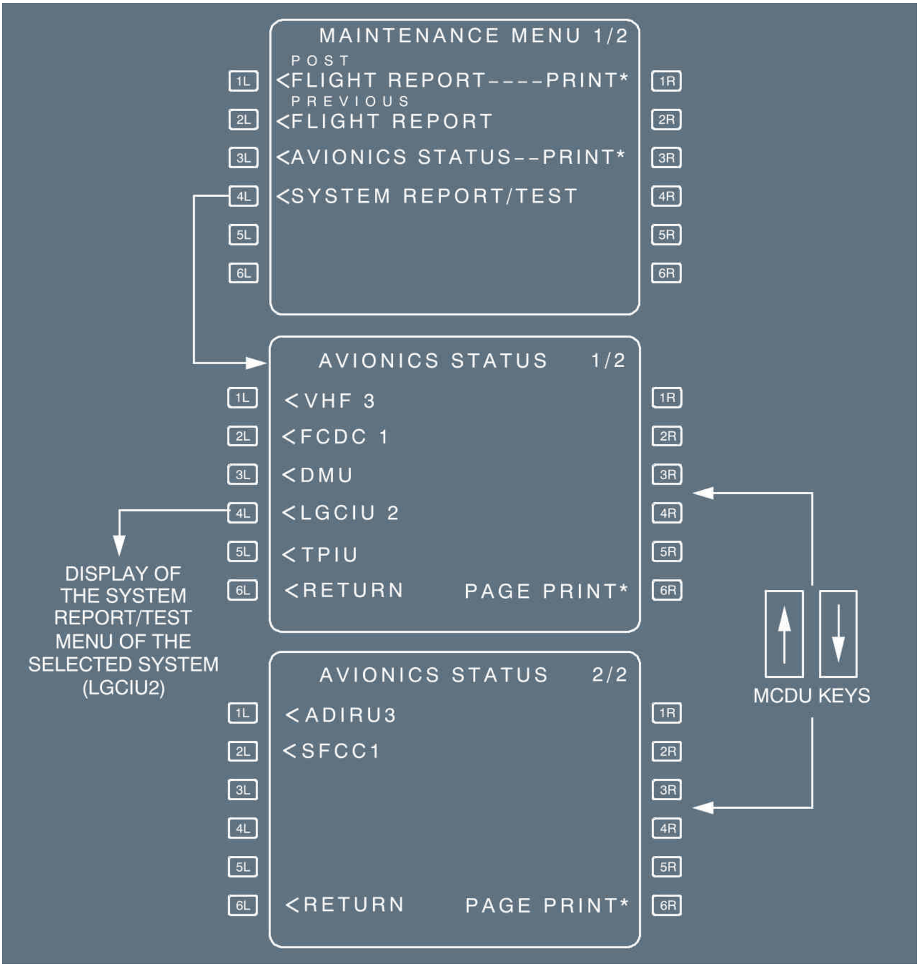
```
POST FLIGHT REPORT 1/2
FAULT MESSAGES
UTC         DATE     FLTN
1015        MAR31    ITF1027

 UTC  PH    ATA      SOURCE
<1023 03    361143    BMC3
 THRM(SHA3)/FAN AIR-V
 (12HAS3)/SENSE LINE
<RETURN        PAGE PRINT*
WARNING MESSAGES :←
```

On ground, the operator can either print a flight report or a screen copy. The format is identical to that of the POST FLIGHT REPORT. The operator can send a flight report to the airline ground computer by selecting the corresponding SEND key.

AVIONICS STATUS

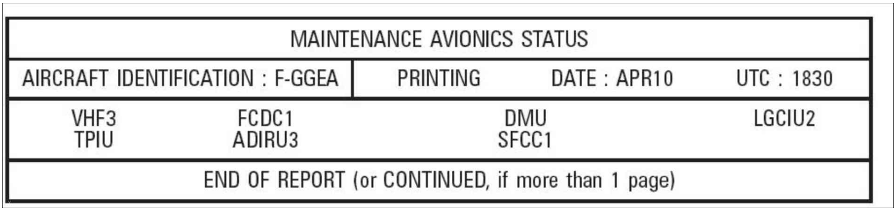
Ident.: DSC-45-20-00001005.0001001 / 19 DEC 12
Applicable to: ALL

This screen displays the list of systems affected by a Class 1 or 2 failure.
The Operator can press the button next to a system to directly call up that system page without going through the SYSTEM REPORT/TEST menu.


MAINTENANCE MENU 1/2
POST
<FLIGHT REPORT----PRINT*
PREVIOUS
<FLIGHT REPORT
<AVIONICS STATUS--PRINT*
<SYSTEM REPORT/TEST
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
AVIONICS STATUS 1/2
<VHF 3
<FCDC 1
<DMU
<LGCIU 2
<TPIU
<RETURN
PAGE PRINT*
DISPLAY OF THE SYSTEM REPORT/TEST MENU OF THE SELECTED SYSTEM (LGCIU2)
MCDU KEYS
AVIONICS STATUS 2/2
<ADIRU3
<SFCC1
<RETURN
PAGE PRINT*

In flight, or on ground, the operator can either print the complete AVIONICS STATUS report, or only a copy of the screen.

AVIONICS STATUS PRINT OUT



MAINTENANCE AVIONICS STATUS

AIRCRAFT IDENTIFICATION : F-GGEA | PRINTING | DATE : APR10 | UTC : 1830

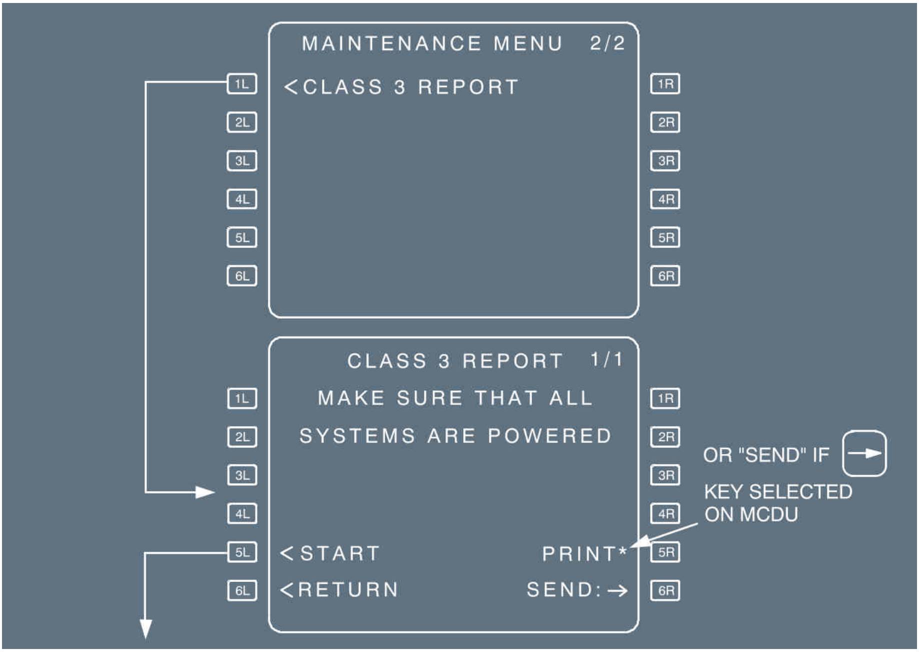
VHF3 TPIU	FCDC1 ADIRU3	DMU SFCC1	LGCIU2

END OF REPORT (or CONTINUED, if more than 1 page)

CLASS 3 REPORT

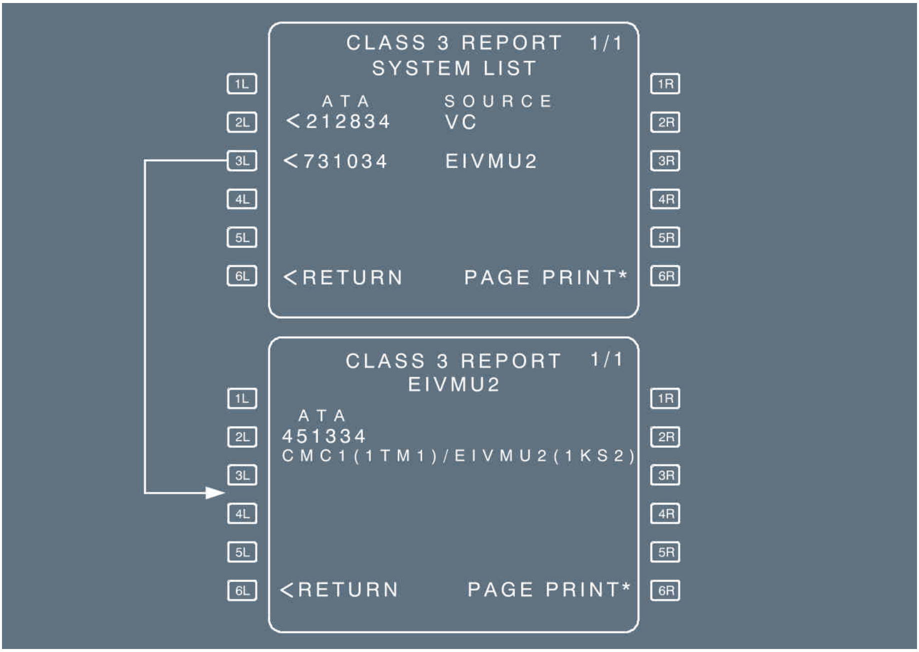
Ident.: DSC-45-20-00001009.0003001 / 19 DEC 12
Applicable to: ALL

This report is only created on ground, upon operator request. It presents all class 3 failures detected during the last flight leg, and classifies them by ATA reference number.


MAINTENANCE MENU 2/2
<CLASS 3 REPORT
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
CLASS 3 REPORT 1/1
<START
<RETURN
PRINT*
SEND:→

MAKE SURE THAT ALL SYSTEMS ARE POWERED

OR "SEND" IF → KEY SELECTED ON MCDU



```
    CLASS 3 REPORT   1/1
      SYSTEM LIST
   ATA         SOURCE
<212834        VC

<731034        EIVMU2




<RETURN        PAGE PRINT*
```

```
    CLASS 3 REPORT   1/1
         EIVMU2
 ATA
451334
CMC1(1TM1)/EIVMU2(1KS2)




<RETURN        PAGE PRINT*
```

On ground, the operator can print either the complete report or only a screen copy. They can also send the complete CLASS 3 REPORT to the airline ground computer.

CLASS 3 REPORT PRINT OUT

<table>
<tr><td colspan="4">MAINTENANCE CLASS 3 REPORT</td></tr>
<tr><td colspan="3">AIRCRAFT IDENTIFICATION : F-GGEA</td><td>PRINTING DATE : APR10 UTC : 1830</td></tr>
<tr><td>SOURCE
ATA</td><td>NAME</td><td>ATA MESSAGE :</td><td>ATA MESSAGE :</td></tr>
<tr><td>212834</td><td>VC</td><td>212830 OUTFLOW VALVE 10HL1
451334 CMC1(1TM1)/EIVMU3(1KS3)</td><td>213020 TEMP SENSOR 23HK</td></tr>
<tr><td>731034</td><td>EIVMU2</td><td>451334 CMC1(1TM1)/EIVMU3(1KS3)</td><td></td></tr>
<tr><td colspan="4">END OF REPORT (or CONTINUED, if more than 1 page)</td></tr>
</table>

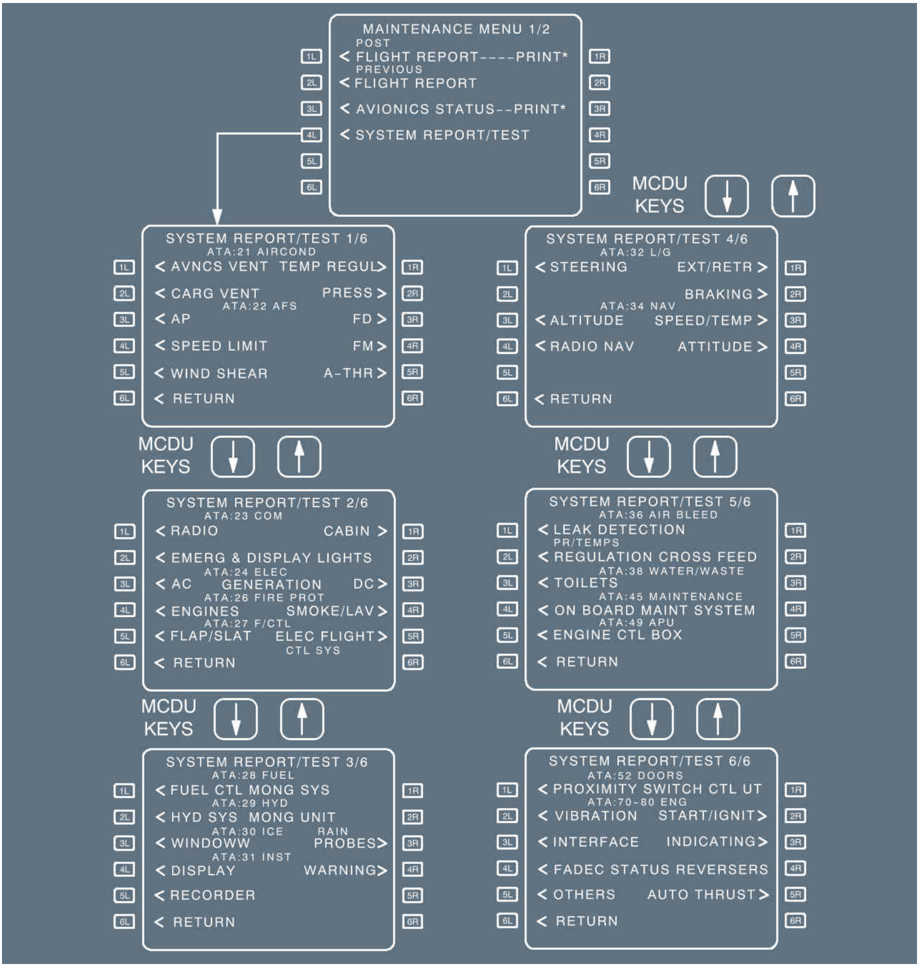
SYSTEM REPORT/TEST

Ident.: DSC-45-20-00001020.0001001 / 21 MAR 16

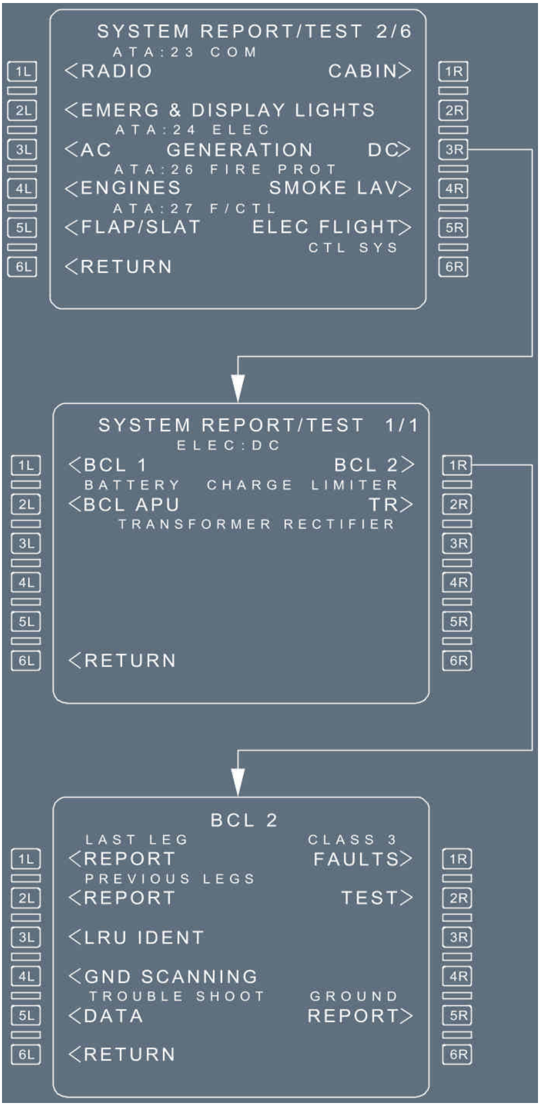
Applicable to: ALL

It allows access to all electronic systems. After the system selection, the CMC enters into the interactive dialogue with this system.

All systems are classified by ATA chapter on six MCDU pages.


MAINTENANCE MENU 1/2
POST
< FLIGHT REPORT----PRINT*
PREVIOUS
< FLIGHT REPORT
< AVIONICS STATUS--PRINT*
< SYSTEM REPORT/TEST
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
MCDU KEYS
SYSTEM REPORT/TEST 1/6
ATA:21 AIRCOND
< AVNCS VENT TEMP REGUL>
< CARG VENT PRESS >
ATA:22 AFS
< AP FD >
< SPEED LIMIT FM >
< WIND SHEAR A-THR >
< RETURN
SYSTEM REPORT/TEST 2/6
ATA:23 COM
< RADIO CABIN >
< EMERG & DISPLAY LIGHTS
ATA:24 ELEC
< AC GENERATION DC >
ATA:26 FIRE PROT
< ENGINES SMOKE/LAV >
ATA:27 F/CTL
< FLAP/SLAT ELEC FLIGHT >
CTL SYS
< RETURN
SYSTEM REPORT/TEST 3/6
ATA:28 FUEL
< FUEL CTL MONG SYS
ATA:29 HYD
< HYD SYS MONG UNIT
ATA:30 ICE RAIN
< WINDOWW PROBES>
ATA:31 INST
< DISPLAY WARNING>
< RECORDER
< RETURN
SYSTEM REPORT/TEST 4/6
ATA:32 L/G
< STEERING EXT/RETR >
BRAKING >
ATA:34 NAV
< ALTITUDE SPEED/TEMP >
< RADIO NAV ATTITUDE >
< RETURN
SYSTEM REPORT/TEST 5/6
ATA:36 AIR BLEED
< LEAK DETECTION
PR/TEMPS
< REGULATION CROSS FEED
ATA:38 WATER/WASTE
< TOILETS
ATA:45 MAINTENANCE
< ON BOARD MAINT SYSTEM
ATA:49 APU
< ENGINE CTL BOX
< RETURN
SYSTEM REPORT/TEST 6/6
ATA:52 DOORS
< PROXIMITY SWITCH CTL UT
ATA:70-80 ENG
< VIBRATION START/IGNIT>
< INTERFACE INDICATING>
< FADEC STATUS REVERSERS
< OTHERS AUTO THRUST >
< RETURN

EXAMPLE : ACCESS TO BCL 2

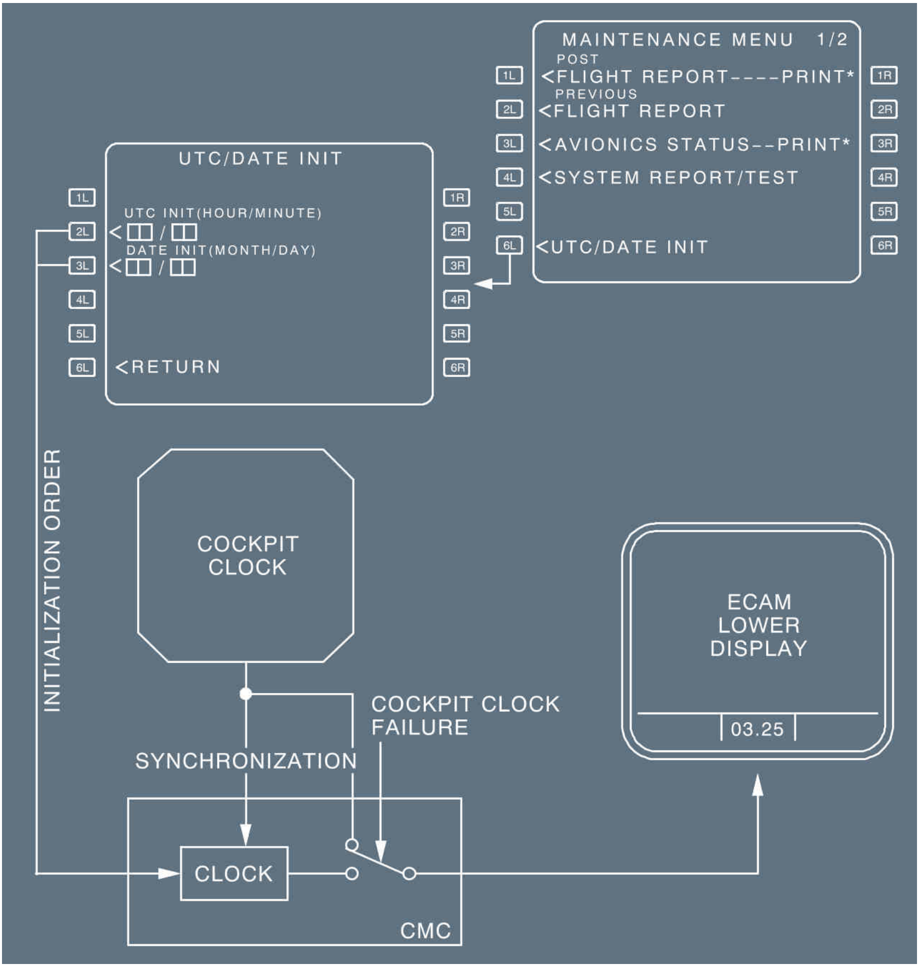

SYSTEM REPORT/TEST 2/6
ATA:23 COM
<RADIO
CABIN>
<EMERG & DISPLAY LIGHTS
ATA:24 ELEC
<AC
GENERATION
DC>
ATA:26 FIRE PROT
<ENGINES
SMOKE LAV>
ATA:27 F/CTL
<FLAP/SLAT
ELEC FLIGHT>
CTL SYS
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SYSTEM REPORT/TEST 1/1
ELEC:DC
<BCL 1
BCL 2>
BATTERY CHARGE LIMITER
<BCL APU
TR>
TRANSFORMER RECTIFIER
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
BCL 2
LAST LEG
<REPORT
CLASS 3
FAULTS>
PREVIOUS LEGS
<REPORT
TEST>
<LRU IDENT
<GND SCANNING
TROUBLE SHOOT
<DATA
GROUND
REPORT>
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

In this example, the operator has accessed to the menu of the selected systems :
- LAST or PREVIOUS LEG REPORT : presents the list of LRU affected by a failure.
- LRU IDENT : contains the P/N of all LRUs of the system.
- GND SCANNING : runs the flight monitoring on ground and presents the faulty LRU.
- TROUBLE SHOOT DATA : provides system internal data concerning each failure.
- CLASS 3 FAULT : presents class 3 failures detected by the system during the last flight leg.
- TEST : runs the power up test and system test (if any) and display the result.
- GROUND REPORT : presents the list of LRU affected by a failure with the aircraft on ground.

UTC/DATE INIT

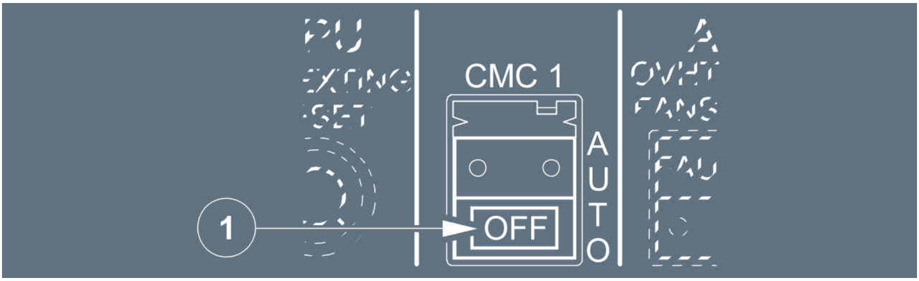
Ident.: DSC-45-20-00001027.0002001 / 21 MAR 16
Applicable to: ALL

The CMC transmits to the aircraft systems, and the lower ECAM displays the GMT coming from the main clock).
In case of cockpit clock failure, the internal clock of the CMC (synchronized on the cockpit clock) takes over. If, in addition, there is a long power interrupt (greater than 5 s), crew action is required to initialize the GMT and DATE via the MCDU.


MAINTENANCE MENU 1/2
POST
<FLIGHT REPORT----PRINT*
PREVIOUS
<FLIGHT REPORT
<AVIONICS STATUS--PRINT*
<SYSTEM REPORT/TEST
<UTC/DATE INIT
1L 2L 3L 4L 5L 6L
1R 2R 3R 4R 5R 6R
UTC/DATE INIT
UTC INIT(HOUR/MINUTE)
<□□/□□
DATE INIT(MONTH/DAY)
<□□/□□
<RETURN
INITIALIZATION ORDER
COCKPIT CLOCK
SYNCHRONIZATION
COCKPIT CLOCK FAILURE
CLOCK
CMC
ECAM LOWER DISPLAY
03.25

CMC RECONFIGURATION

Ident.: DSC-45-20-00001031.0001001 / 06 MAR 17
Applicable to: ALL



(1) CMC 1 pb sw

AUTO	:	CMC 1 is active while CMC 2 ⊲ is in stand-by. CMC 2 ⊲ automatically takes over if CMC 1 fails.
OFF	:	CMC 1 selected off. CMC 2 ⊲ is active.

DESCRIPTION

Ident.: DSC-45-30-00001036.0006001 / 22 JUL 14
Applicable to: ALL

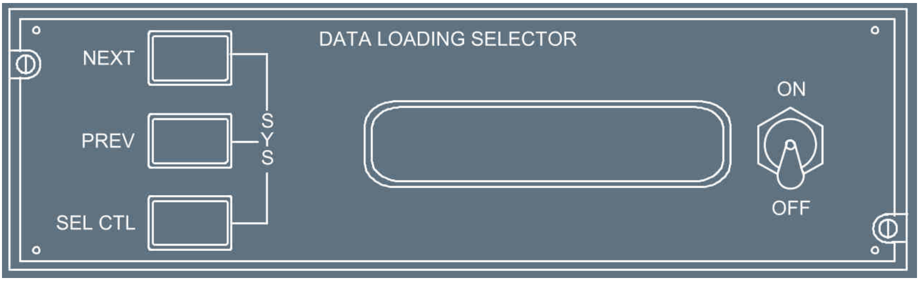
The data loading system is an interface between aircraft systems and ground-based data processing stations.

The data loading system enables:
- To upload database or to modify operational software in aircraft systems, or
- To download system reports from various aircraft systems.

The connection between the data loading system and the ground-based data processing stations is performed:
- Via the Multipurpose Disk Drive Unit (MDDU) ◁ , using 3.5 diskettes, or
- Via the Centralized Data Loading Connector (CDLC) ◁ .

The Data Loading Selector on the overhead panel enables to guide data to and from selected aircraft systems.

The Data Loading Selector enables to select the following aircraft systems:
- FMGEC
- SATCOM ◁
- HFDR ◁
- CBMU
- TCAS
- ELMU
- FDIMU
- DMC
- BMC
- CMC
- ATSU
- EEC

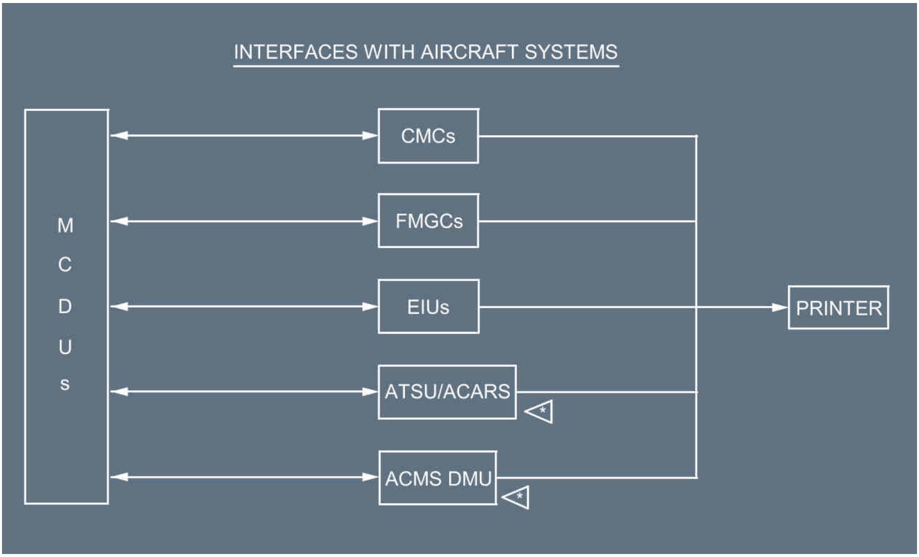


- The screen displays the selected system.
- The ON/OFF sw enables to turn ON or OFF the data loading system,
- The NEXT and PREV enable to scroll the list of applicable aircraft systems which are displayed on the screen,
- The SEL CTL enables to select or deselect the displayed aircraft system.

DESCRIPTION

Ident.: DSC-45-35-00016075.0001001 / 03 FEB 15
Applicable to: ALL

The printer is the output unit for data printing, which can be either generated manually from the MCDUs, or automatically depending on the system.
The data printouts are described in the CMC FUNCTIONS description (*Refer to DSC-45-20 CMC RECONFIGURATION*), or in the related system descriptions.

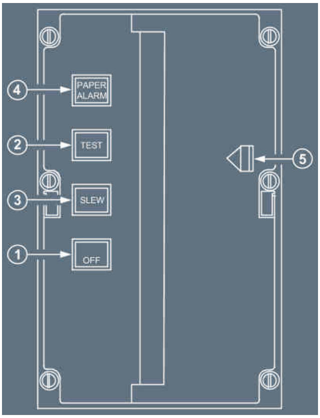


The printer is installed at the rear of the pedestal on the F/O’s side.

CONTROLS AND INDICATORS

Ident.: DSC-45-35-00001043.0001001 / 03 FEB 15
Applicable to: ALL

Depending on the type of printer installed on the aircraft, the flight crew may use one of the following descriptions.



(1) OFF pb-sw

OFF : OFF light comes on steady, printer is off.

On : OFF light extinguishes. Then the printer is normal operation provided that:
- No indication light on the front panel is on
- The access door is closed
- There is paper in front of the print head.

Note: When an internal fault in the printer is detected, the OFF light will come on steady.

(2) TEST pb

TEST : When pressed and released, the printer is performing a self-test provided that the printer is not in communication with a connected system.

(3) SLEW pb-sw

SLEW : When pressed and released, the printer unrolls the paper.

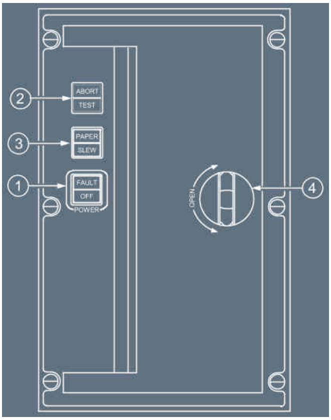
(4) PAPER ALARM pb-sw

PAPER ALARM : This light comes on steady when the paper roll is missing, empty or low.

Note: If SLEW pb-sw and PAPER ALARM pb-sw are pressed and released at the same time:
- *The printer aborts the printing in progress, PAPER ALARM light is on, or*
- *The printer moves the paper backward provided that the access door is open.*

(5) ACCESS DOOR latch

The latch locks the printer access door.
On the inner side of the access door, a label gives paper loading instructions.



(1) OFF/FAULT pb-sw

OFF : OFF light comes on steady, printer is off.

On : OFF light extinguishes. Then the printer is normal operation provided that:
- SLEW light and TEST light are on
- The access door is closed
- There is paper in front of the print head.

FAULT : When an internal fault in the printer is detected, the FAULT light comes on steady.

(2) ABORT/TEST pb-sw

ABORT : When pressed and released, the printer aborts the printing in progress.

TEST : When pressed and released, the printer is performing a self-test provided that the printer is on and no printing is in progress.

(3) PAPER/SLEW pb-sw

PAPER : PAPER light comes on steady when the paper roll is missing, empty or low.

SLEW : When pressed and released, the printer unrolls the paper.

Note: If PAPER/SLEW pb-sw and ABORT/TEST pb-sw are pressed at the same time, the printer moves the paper backward provided that the access door is open.

(4) ACCESS DOOR latch

The latch locks the printer access door.
On the inner side of the access door, a label gives paper loading instructions.

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AIRCRAFT SYSTEMS

INFORMATION SYSTEM

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DSC-46-10 Datalink

DSC-46-10-10 General System Description

Overview.......A
Architecture.......B
Cockpit Interface.......C
Datalink Message.......D

DSC-46-10-20 AOC Applications

DSC-46-10-20-10 General

General.......A

DSC-46-10-30 ATC Applications

DSC-46-10-30-10 Notifications

Notification.......A

DSC-46-10-30-20 Controller/Pilot Datalink Communication (CPDLC)

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Connect.......B
Request.......C
Position Report.......D
MSG Modify.......E
Max Uplink Delay.......F
Emergency.......G

DSC-46-10-30-30 Automatic Dependent Surveillance-Contract (ADS-C)

ADS-Contract.......A

DSC-46-10-30-40 Departure Clearance (DCL)

Departure Clearance.......A

DSC-46-10-30-50 Oceanic Clearance (OCL)

Oceanic Clearance.......A

DSC-46-10-30-60 Digital-Automatic Terminal Information System (D-ATIS)

Digital - ATIS.......A

DSC-46-10-30-70 Message Record

Message Record.......A
Message Record/Log.......B

DSC-46-10-40 Controls and Indicators

DSC-46-10-40-10 ATC Message Pushbutton (ATC MSG PB)

ATC MSG Pb.......A

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DSC-46-10-40-20 Datalink Control and Display Unit (DCDU)

DCDU....................A

DSC-46-10-40-30 MCDU Datalink Pages

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ADS-C DETAIL....................B
ATC LAT REQ....................C
ATC MENU....................D
ATC OTHER REQ....................E
ATC REPORTS....................F
ATC VERT REQ....................G
ATIS AUTO-UPDATE....................H
ATIS MENU....................I
ATIS REPORT....................J
ATSU DATALINK....................K
COMM CONFIG....................L
COMM MENU....................M
COMM STATUS....................N
CONNECTION....................O
CONNECTION STATUS....................P
DATALINK STATUS....................Q
DEPART REQ....................R
EMERGENCY....................S
MAX UPLINK DELAY....................T
MSG LOG....................U
MESSAGE MODIFY....................V
MSG RECORD....................W
NOTIFICATION....................X
OCEANIC REQ....................Y
POSITION REPORT....................Z
TEXT....................AA
VHF3 DATA MODE....................AB
VHF3 SCAN SELECT....................AC
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DSC-46-10-40-40 MCDU Scratchpad Messages

MCDU Scratchpad Messages....................A

DSC-46-10-40-50 MCDU Data Entry Format

MCDU Data Entry Format....................A

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Continued from the previous page

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DSC-46-10-50 How To

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How to Initialize...B
How to Notify...C
How to Connect...D
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How to Answer...F
How to Send a Position Report...G
How to Obtain DCL...H
How to Obtain OCL...I
How to Obtain D-ATIS...J
How to Send EMER MSG...K
How to Modify FLT Plan...L

DSC-46-10-100 Temporary Abnormal Behaviors

ATC MSG RECORD NOT RELIABLE - Displayed at ATSU Power-up...A

DSC-46-20 Aircraft Information Network System (AINS)

Introduction...A
System Description...B
Cockpit Arrangement...C

DSC-46-40 EFB

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Landing Application...C
Takeoff Application...D
In-flight Application...E
Loadsheet Application...F
OPS Library Application...G
Electronic QRH Application...H
Manager Application...I

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OVERVIEW

Ident.: DSC-46-10-10-00020958.0002001 / 26 NOV 19
Applicable to: LV-GKO, LV-GKP

The datalink has:
- AOC applications ◁

L2 The flight crew uses the AOC applications to communicate with Airline Operational Center (AOC).

L1
- ATC applications ◁

L2 The flight crew uses the ATC applications to communicate with Air Traffic Control (ATC) centers.

L1 The ATC datalink provides communication, navigation, and surveillance for Air Traffic Management (ATM) services.
The ATC datalink applications enable air traffic controllers to follow the aircraft navigation, and enhance the air traffic flow.

The datalink communication (messages exchange) between the aircraft and the ground is achieved:
- Automatically (without a flight crew action)
- Manually (with a flight crew action via the DCDU/MCDU and/or RMP).

The datalink messages are:
- Uplink (from a ground facilities to the flight crew), or
- Downlink (from the flight crew to a ground facilities).

COMMUNICATION AND NAVIGATION FOR AIR TRAFFIC MANAGEMENT

At the beginning of the flight, the flight crew sends a notification message to the ATC center, via the MCDU, notification application ◁ .
Then, an air traffic controller will establish a connection between the aircraft and the ATC center.
As a result, the flight crew can exchange messages with the ATC center, via the DCDU (CPDLC application ◁). The messages that the flight crew sends to the ATC center can be built with present frames and modified via the MCDU.

Depending on the type of datalink exchange, the datalink uses one of the following communication networks:
- ACARS for FANS A ◁ applications
- ACARS Air Traffic Services (ATS 623) for optional applications ◁ .

Note: *FANS A+ ◁ is an evolution of the FANS A ◁ that introduces ATS 623 applications and datalink recording capability.*

ATC DATALINK COMMUNICATION

The ATC datalink provides:
- FANS A applications (FANS 1/A in ICAO designation) using ACARS ground network, for operations in remote areas and in oceanic areas:
  - Notification
  - Controller-Pilot DataLink Communication (CPDLC)
  - Automatic Dependent Surveillance - Contract (ADS-C).

NAVIGATION AND SURVEILLANCE FOR AIR TRAFFIC MANAGEMENT

The Automatic Dependent Surveillance (ADS) system sends aircraft position and aircraft navigation data to ATC centers and other aircraft.

There are two different ADS applications:
- ADS-Contract (ADS-C) ◁
  The ADS-C automatically sends aircraft surveillance data to connected ATC centers via ATC Datalink ◁ in remote or oceanic areas.
- ADS-Broadcast (ADS-B) ◁
  The ADS-B automatically broadcasts the aircraft position and navigation data to other users (ATC centers or other aircraft) equipped with a Mode S transponder. The ATC Datalink ◁ does not host the ADS-B ◁ .

SERVICE PROVIDERS

The role of a communication service provider is to deliver a message from the A/C to a ground end system and vice versa.
A datalink service provider ensures routing of datalink messages between the aircraft and ATC center.

L2 For VHF communication, the two main providers are ARINC and SITA that operate worldwide networks.

L1 REVERSION TO VOICE COMMUNICATION

Voice communication is a primary means of communication on board.

The flight crew must revert from datalink communication to voice communication, if:
- There is an emergency situation (exchange of a critical or urgent message)
- There is a doubt about a datalink message, the voice should be used for clarification
- An operational timer of datalink message exchange times out
- A response to an ATC message was not correctly transmitted via datalink.

CLOCK ACCURACY

The required time precision for ATC datalink communications is +/-1 s UTC. If this constraint is not respected, a rejection of datalink message or acceptance of obsolete datalink message may occur.
Not respecting this constraint may lead to the rejection of messages or to the acceptance of obsolete messages.
For FANS operations, the flight crew should not manually set the clock during cockpit preparation.

OVERVIEW

Ident.: DSC-46-10-10-00020958.0005001 / 26 NOV 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The datalink has:
- AOC applications ◁

L2 The flight crew uses the AOC applications to communicate with Airline Operational Center (AOC).

L1
- ATC applications ◁

L2 The flight crew uses the ATC applications to communicate with Air Traffic Control (ATC) centers.

L1 The ATC datalink provides communication, navigation, and surveillance for Air Traffic Management (ATM) services.
The ATC datalink applications enable air traffic controllers to follow the aircraft navigation, and enhance the air traffic flow.

The datalink communication (messages exchange) between the aircraft and the ground is achieved:
- Automatically (without a flight crew action)
- Manually (with a flight crew action via the DCDU/MCDU and/or RMP).

The datalink messages are:
- Uplink (from a ground facilities to the flight crew), or
- Downlink (from the flight crew to a ground facilities).

COMMUNICATION AND NAVIGATION FOR AIR TRAFFIC MANAGEMENT

At the beginning of the flight, the flight crew sends a notification message to the ATC center, via the MCDU, notification application ◁ .
Then, an air traffic controller will establish a connection between the aircraft and the ATC center.
As a result, the flight crew can exchange messages with the ATC center, via the DCDU (CPDLC application ◁). The messages that the flight crew sends to the ATC center can be built with present frames and modified via the MCDU.

Depending on the type of datalink exchange, the datalink uses one of the following communication networks:
- ACARS for FANS A ◁ applications
- ACARS Air Traffic Services (ATS 623) for optional applications ◁ .

Note: *FANS A+ ◁ is an evolution of the FANS A ◁ that introduces ATS 623 applications and datalink recording capability.*

ATC DATALINK COMMUNICATION

The ATC datalink provides:
- FANS A applications (FANS 1/A in ICAO designation) using ACARS ground network, for operations in remote areas and in oceanic areas:
  - Notification
  - Controller-Pilot DataLink Communication (CPDLC)
  - Automatic Dependent Surveillance - Contract (ADS-C).
- ATS 623 applications (ACARS ATS in ICAO designation) using ACARS ground network:
  - Departure Clearance (DCL)
  - Oceanic Clearance (OCL)
  - Digital - Automatic Terminal Information Service (D-ATIS).

For the description of associated Performance-Based Communication and Surveillance (PBCS) concept and requirements, *Refer to PRO-SPO-52-PBCS*.

NAVIGATION AND SURVEILLANCE FOR AIR TRAFFIC MANAGEMENT

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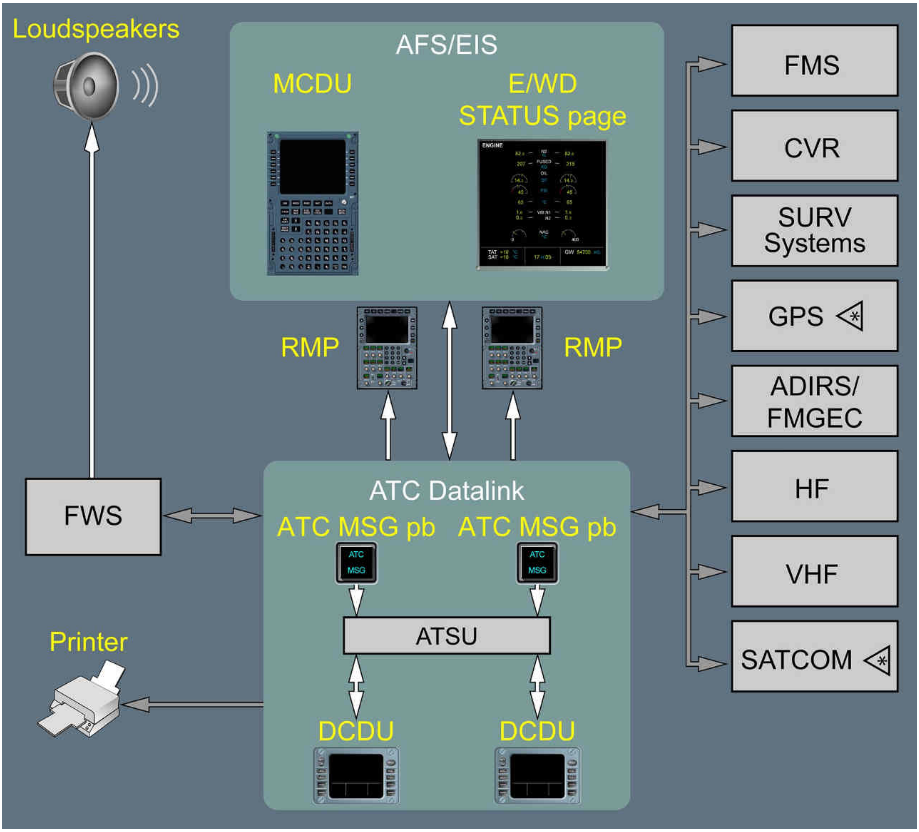
ARCHITECTURE

Ident.: DSC-46-10-10-10-00020957.0001001 / 21 MAR 17
Applicable to: ALL

Architecture of the ATC Datalink


Loudspeakers
AFS/EIS
MCDU
E/WD
STATUS page
FMS
CVR
SURV
Systems
GPS
ADIRS/
FMGEC
HF
VHF
SATCOM
RMP
RMP
FWS
ATC Datalink
ATC MSG pb
ATC MSG pb
ATC
MSG
ATC
MSG
ATSU
Printer
DCDU
DCDU

Ident.: DSC-46-10-10-10-00020948.0001001 / 21 MAR 17
Applicable to: ALL

AIR DATA/INERTIAL REFERENCE SYSTEM (ADIRS)

The ADIRS provide aircraft position data to the FMGEC. The FMGEC consolidates the position value from different sources and transmits it to the ATSU. This is the primary source for the aircraft position.

Ident.: DSC-46-10-10-10-00020954.0001001 / 01 MAR 18
Applicable to: ALL

AIR TRAFFIC SERVICE UNIT (ATSU)

The ATSU controls all datalink communication and automatically selects the best available communication media:
- VHF
- HF
- SATCOM ◁ .

The ATSU hosts:
- AOC applications ◁
- ATC applications ◁
- Router services
  The ATSU router automatically selects VHF frequency, depending on the aircraft position, in accordance with an entered scan mask (airline policy).
  The scan mask means that a list of VHF datalink service providers, selected via the VHF 3 SCAN SELECT page, is scanned, in accordance with their priority level. The VHF scan mask is compulsory for correct router operation. If there is no scan mask, the ECAM displays DATALINK ATSU FAULT – ATSU INIT FAULT.

Ident.: DSC-46-10-10-10-00020950.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

COCKPIT VOICE RECORDER (CVR)

In addition to its voice recording function, the CVR records the data that the flight crew and the air traffic controller exchange.

Ident.: DSC-46-10-10-10-00020955.0001001 / 21 MAR 17
Applicable to: ALL

DATALINK CONTROL AND DISPLAY UNIT (DCDU)

The DCDU enables the flight crew to:

- Read and answer datalink messages, received from the ground
- Display datalink messages, before sending.

Ident.: DSC-46-10-10-10-00021269.0001001 / 21 MAR 17
Applicable to: ALL

FLIGHT MANAGEMENT SYSTEM (FMS)

The ATC datalink interacts with Flight Management Computers (FMC).

The FMS:
- Processes datalink messages
- Prepares/generates an answer to datalink messages
- Monitors clearances
- Reminds the flight crew about a clearance, before reaching a clearance condition.
  When a monitored parameter reaches the assigned value, the FMS generates a reminder message via the DCDU.

Ident.: DSC-46-10-10-10-00020956.0001001 / 21 MAR 17
Applicable to: ALL

FLIGHT WARNING SYSTEM (FWS)

The FWS interacts with the ATSU and:

- Alerts, when a datalink message is received
- Alerts, in the case of detected failures
- Inhibits alerts, depending on the flight phase.

Ident.: DSC-46-10-10-10-00020951.0001001 / 21 MAR 17
Applicable to: ALL

GLOBAL POSITIONING SYSTEM (GPS)

The GPS provides the position information to the FMGEC. The position information is consolidated with the ADIRS data and sent to the ATSU.
The GPS also enables time synchronization to the clock, in order to provide UTC date and time for datalink system. If the GPS fails, the clock continues to calculate the time by incrementing the last received pertinent information as the reference time.

Ident.: DSC-46-10-10-10-00020947.0001001 / 22 MAR 17
Applicable to: ALL

HIGH FREQUENCY (HF)

The HF communication system has:
- Data mode
- Voice mode.

HF communication system can be used in the data mode as an alternative to VHF 3 and SATCOM ◁ . In this case, the communication between the aircraft and HF ground stations is established on a HF frequency. A HF frequency of HF DataLink (HFDL) is tuned automatically.

DATALINK/VOICE SWITCHING

The HF can be used in the voice mode. The flight crew can switch datalink/voice and set a voice frequency via the RMP.

Green HF VOICE memo indicates that HF datalink communication is interrupted, when the HF transceiver operates in the voice mode.

Ident.: DSC-46-10-10-10-00020953.0001001 / 21 MAR 17
Applicable to: ALL

MULTI-PURPOSE CONTROL AND DISPLAY UNIT (MCDU)

The MCDU enables the fight crew to access functions to:

- Manage the ATC datalink connections
- Send notifications
- Edit datalink messages
- Consult reports
- Access Message Record application.

Ident.: DSC-46-10-10-10-00021270.0001001 / 21 MAR 17
Applicable to: ALL

PRINTER

The flight crew can print ATC messages, displayed on the DCDU, or the MCDU.

Note: *Each time the flight crew prints a message, they must check that the printed message is identical to the message on the display unit.*
The reference information is the information, that the display unit displays.

Ident.: DSC-46-10-10-10-00020952.0001001 / 21 MAR 17
Applicable to: ALL

RADIO MANAGEMENT PANEL (RMP)

The flight crew sets a radio frequency into the RMP, when a specific datalink message (e.g.: CONTACT, MONITOR, ...) is received, or when a voice contact is required.

Ident.: DSC-46-10-10-10-00021268.0002001 / 15 MAR 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

Frequencies that some datalink messages contain, can be loaded into RMP via LOAD pb of the RMP.

Ident.: DSC-46-10-10-10-00020945.0001001 / 21 MAR 17
Applicable to: ALL

SATELLITE COMMUNICATIONS (SATCOM) ◁

The SATCOM system ◁ provides voice and data services. The voice/data are transmitted via satellite, from the aircraft to the ground earth stations, and then switched through international telecommunications networks (ARINC, SITA, etc.) to anywhere in the world (airline operational centers, ATC centers, etc).
The ATSU (router) manages switching to/from SATCOM ◁ (ACARS environments only).

Ident.: DSC-46-10-10-10-00020949.0001001 / 21 MAR 17
Applicable to: ALL

SURVEILLANCE SYSTEMS (SURV)

The ATC datalink system interacts with the surveillance system and enables the flight crew to:

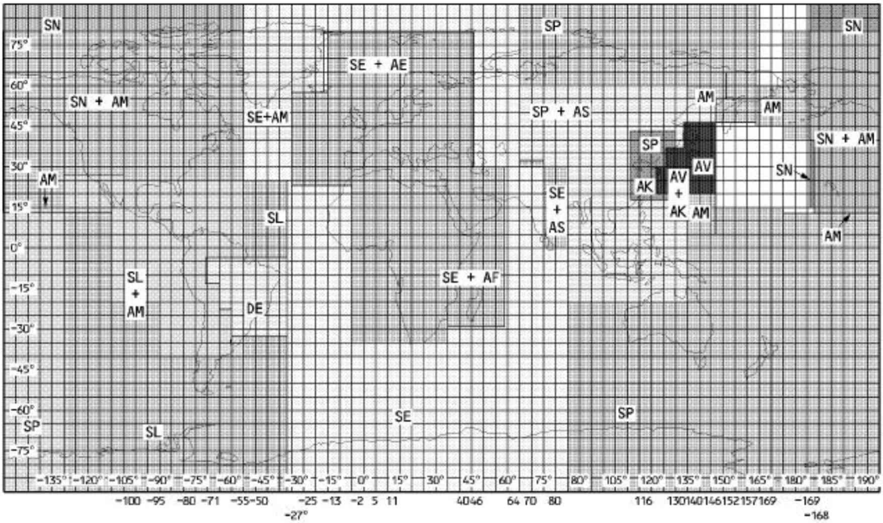
- Provide the ATC center with a TCAS status, sent via the ADS application
- Provide the ATC center with the SQUAWK code as a response to CONFIRM SQUAWK uplink message
- Create In-Trail Procedure (ITP) requests for aircraft equipped with ADS-B ◁

L2 The ITP datalink request is an option.

Ident.: DSC-46-10-10-10-00020946.0002001 / 02 JUN 20
Applicable to: ALL

VERY HIGH FREQUENCY (VHF)

The communication between the aircraft and VHF ground stations is established on a VHF frequency. The datalink system primarily uses VHF 3 communication system. The ATSU router automatically selects a VHF frequency, depending on entered configuration, the scan mask for VHF DataLink (VDL), and the aircraft position.
VHF data link service providers are available in each geographical area.


SN
SP
SN
SE + AE
SN + AM
SE+AM
SP + AS
AM
AM
SN + AM
SP
AV
AV
+
AK
AK
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75°
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-60°
-75°
-135° -120° -105° -90° -75° -60° -45° -30° -15° 0° 15° 30° 45° 60° 75° 80° 105° 120° 135° 150° 165° 180° 185° 190°
-100 -95 -80 -71 -55-50 -25 -13 -2 5 11 4046 64 70 80 116 130140146152157169 -169
-27° -168

SOUTH
ACARS WORLD MAP

The table below defines the world zone abbreviations, indicates their associated Service Provider, MCDU label, and ACARS frequency.

ABBREVIATION	SERVICE PROVIDER	MCDU LABEL	FREQUENCY	Family
SP	SITA PACIFIC	SIT-PAC	131.550 MHz	SITA
SN	SITA NORTH AMERICA	SIT-NAM	131.725 MHz	SITA
SL	SITA LATIN AMERICA	SIT-LAM	131.725 MHz	SITA
SE	SITA EUROPE	SIT-E/A	131.725 MHz	SITA
DE	DEPV BRAZIL	DEPV	131.550 MHz	SITA
AV	AVICOM	AVICOM	131.450 MHz	SITA
AM	ARINC AMERICA	ARI-AM	131.550 MHz	ARINC
AE	ARINC EUROPE	ARI-EUR	131.825 MHz	ARINC
AF	ARINC AFRICA	ARI-AFR	126.900 MHz	ARINC
AK	ARINC KOREA	ARI-KOR	131.725 MHz	ARINC
AS	ARINC ASIA	ARI-ASI	131.450 MHz	ARINC

The VHF 3 communication system has:
- Data mode
- Voice mode.

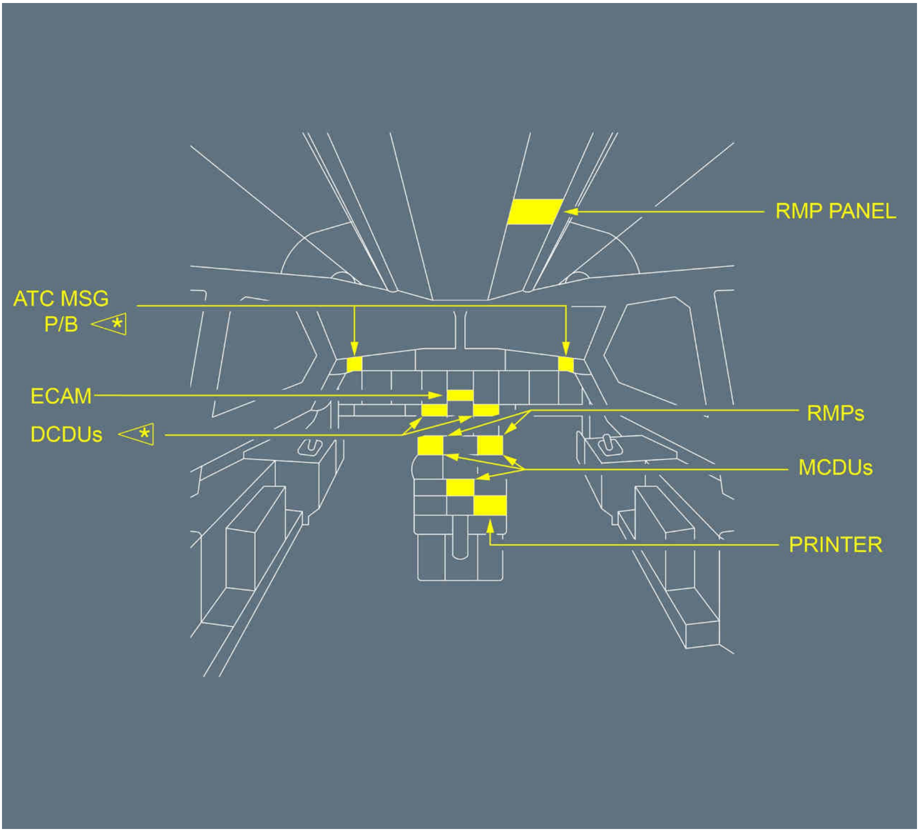
DATALINK/VOICE SWITCHING

The VHF 3 can be used in the voice mode, in case of:
- VHF 1 failure
- VHF 2 failure
- Specific AOC functions (operator's customization)

The flight crew can switch datalink/voice and set a voice frequency via the RMP.

COCKPIT INTERFACE

Ident.: DSC-46-10-10-00020944.0001001 / 21 MAR 17
Applicable to: ALL



The cockpit interface of the datalink system has:

- Datalink Control and Display Unit (DCDU) ◁ on the CAPT and F/O side
  The DCDU displays the uplink and downlink messages and enable the flight crew to control the datalink message exchange.
- ATC MSG pb-sw ◁ on the CAPT and F/O side of the glareshield
  The ATC MSG pb-sw alerts when an uplink message is received and enables the flight crew to cancel the alert.

- Multipurpose Control and Display Unit (MCDU)
  The MCDU enables to manage AOC and ATC functions and data transfer to the DCDU
- Printer
  Datalink messages can be printed, when displayed on the DCDU.
- RMP
  The RMP enables frequency tuning.
- ECAM
  The ECAM informs about the abnormal operation.

DATALINK MESSAGE

Ident.: DSC-46-10-10-30-00020942.0001001 / 21 MAR 17
Applicable to: ALL

UPLINK MESSAGE RECEPTION

When a datalink message is received, the flight crew reads, and manages the messages on the DCDU. The status of received message is OPEN, and changes during processing. Urgent messages or messages with higher priority are automatically displayed to the flight crew.
If a normal message is displayed on the DCDU, when receiving an urgent message, the DCDU will display the urgent message. The normal message stays in the file queue. The flight crew can retrieve the normal message by pressing MSG+/MSG- keys.

Ident.: DSC-46-10-10-30-00020943.0001001 / 21 MAR 17
Applicable to: ALL

UPLINK MESSAGE RECEPTION ALERT

The flight crew is alerted, when a datalink message is received. A dedicated aural alert activates and the ATC MSG pb-sw illuminates on CAPT side and on F/O side.

Note: *The ATC chime is triggered:*
- *Every 15 s, if a normal datalink message is received*
- *Every 5 s, if an urgent datalink message is received*

These cockpit alerts stop, if one of the ATC MSG pb-sw is pushed, or if the flight crew answers the datalink message via the DCDU.

Note: *ATC datalink alerts are inhibited during takeoff and landing phases.*

When a normal datalink message is received, this message will appear on the DCDU screen, if the screen is empty. If the DCDU screen is not empty, this message will not appear on the screen automatically, and the MSG (number) will flash in the information field of the DCDU.
When an urgent datalink message is received, this message will automatically appear on the DCDU screen.

Ident.: DSC-46-10-10-30-00020941.0001001 / 21 MAR 17
Applicable to: ALL

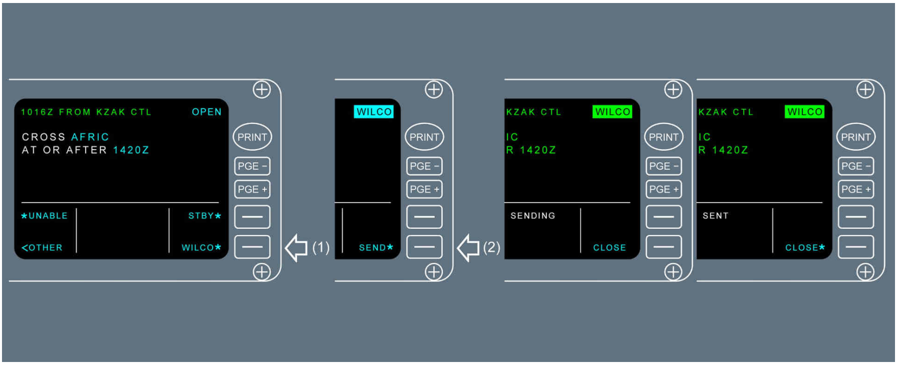
UPLINK MESSAGE RESPONSE

The flight crew can answer to an ATC datalink message:

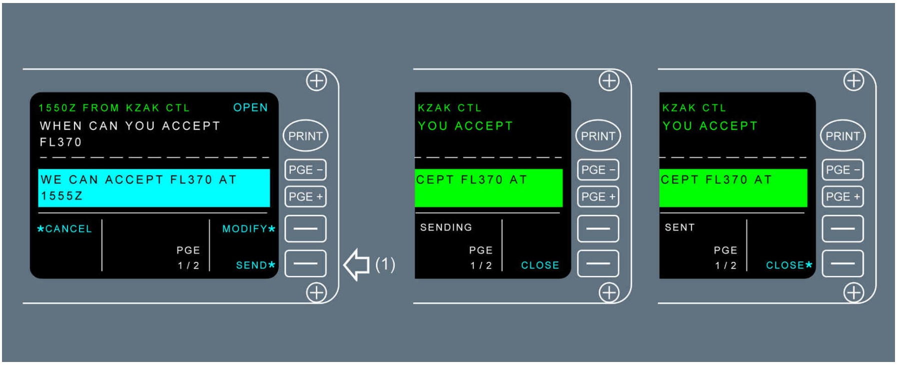
- Directly
  Several types of datalink messages enable the flight crew to answer directly, via the DCDU. The flight crew can launch preparation of a response message by pressing an appropriate function key (e.g.: WILCO, ROGER, AFFIRM, NEGATIVE, ...), on the DCDU. Consequently, the FMGS will generate a response message on the DCDU. The flight crew can send prepared response message to the ATC by pressing SEND function key of the DCDU.
- Indirectly
  Datalink messages that cannot be answered directly via the DCDU, are prepared on the MCDU. The flight crew selects the appropriate function key (EDIT or MODIFY), on the DCDU, in order to display desired MCDU page (EDIT or MESSAGE MODIFY page). The flight crew enters relevant values and information for the response via the page of the MCDU.
  When desired information is inserted, the flight crew must transfer the information from the MCDU to the DCDU, by pressing appropriate key on the MCDU. Consequently, prepared response message appears on the DCDU.

If the prepared downlink message has more than one page, the flight crew must display, and review all pages of the message on the DCDU, before the message is sent to the ATC. When the flight crew displays all pages of the message, an asterisk (*) appears next to SEND function key of the DCDU. The asterisk (*) indicates that the function key is active, and the function can be used.
If the flight crew cannot answer to an ATC uplink message immediately, a stand-by (STBY) message can be sent to the ATC. When a STBY response message is sent, the message status, displayed on the DCDU, changes to STBY. This message cannot be removed from the DCDU, until the flight crew sends a final response later on.
When a downlink message is successfully sent, the message information area will indicate SENT and the color code of the message will change.

EXAMPLE	Clearance message: The flight crew can answer positively, by selecting WILCO* See (1) and send the message to the ATC, by selecting SEND* See (2) on the DCDU. SENDING appears in the information area of the DCDU, when SEND* is selected. SENT appears in the information area of the DCDU, when the message is successfully sent.


1016Z FROM KZAK CTL
OPEN
CROSS AFRIC
AT OR AFTER 1420Z
*UNABLE
STBY*
<OTHER
WILCO*
PRINT
PGE -
PGE +
(1)
WILCO
SEND*
(2)
KZAK CTL
WILCO
IC
R 1420Z
SENDING
CLOSE
KZAK CTL
WILCO
IC
R 1420Z
SENT
CLOSE*

EXAMPLE	Negotiation message: The flight crew can send the response message, automatically generated on the DCDU, to the ATC, by selecting SEND* See (1). SENDING appears in the information area of the DCDU, when SEND* is selected. SENT appears in the information area of the DCDU, when the message is successfully sent.


1550Z FROM KZAK CTL
OPEN
WHEN CAN YOU ACCEPT
FL370
WE CAN ACCEPT FL370 AT
1555Z
*CANCEL
MODIFY*
PGE
1 / 2
SEND*
PRINT
PGE -
PGE +
(1)
KZAK CTL
YOU ACCEPT
CEPT FL370 AT
SENDING
PGE
1 / 2
CLOSE
KZAK CTL
YOU ACCEPT
CEPT FL370 AT
SENT
PGE
1 / 2
CLOSE*

When a downlink message is not successfully sent, the message information area will indicate SEND FAILED or other, depending on a datalink connection error or failure. In these cases, the flight crew must close the message. A new request can be created, in order to send the message.

Ident.: DSC-46-10-10-30-00020940.0001001 / 21 MAR 17
Applicable to: ALL

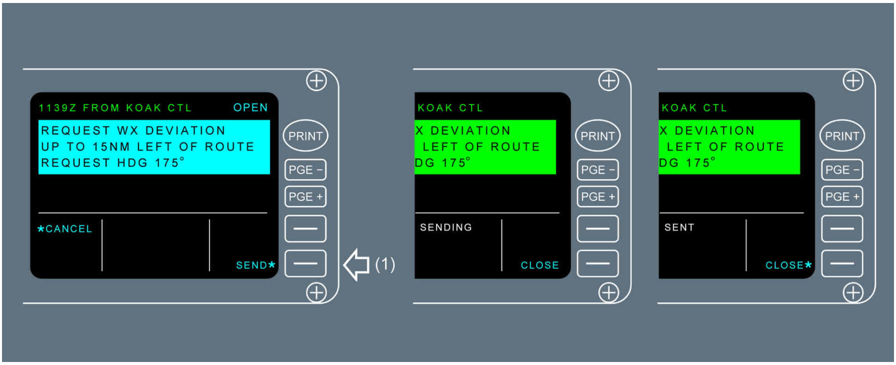
DOWNLINK MESSAGE CREATION

The flight crew can also create and send a request to the ATC.

A request message created by the flight crew and sent to ATC has:

- Cyan (blue) background before sending
- Green background, after sending.

EXAMPLE	Request message: The flight crew can send prepared message to the ATC by selecting SEND* See (1) on the DCDU. SENDING appears in the information area of the DCDU, when SEND* is selected. SENT appears in the information area of the DCDU, when the message is successfully sent.



1139Z FROM KOAK CTL OPEN
REQUEST WX DEVIATION
UP TO 15NM LEFT OF ROUTE
REQUEST HDG 175°
CANCEL SEND

KOAK CTL
X DEVIATION
LEFT OF ROUTE
DG 175°
SENDING CLOSE

KOAK CTL
X DEVIATION
LEFT OF ROUTE
DG 175°
SENT CLOSE*

Note: *The flight crew should avoid:*

- *Sending multiple clearance requests in the same message.*
- *Re-sending a message, if the ATC does not answer immediately.*

Ident.: DSC-46-10-10-30-00021267.0001001 / 21 MAR 17
Applicable to: ALL

CLOSING AND REMOVAL OF THE MESSAGE FROM THE DCDU

When the flight crew sends the datalink message via the DCDU, The message should be closed, by pressing the CLOSE function key. Closing the message will clean the DCDU screen.

Ident.: DSC-46-10-10-30-00020939.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

The RECALL function key of the DCDU can be used to display the last closed message.
Other messages can be viewed on the MSG LOG page of the MCDU .

Note: *Before each flight, the MSG LOG file of previous flight should be erased.*

Ident.: DSC-46-10-10-30-00020939.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The RECALL function key of the DCDU can be used to display the last closed message.
Other messages can be viewed on the MSG RECORD page of the MCDU.

Note: *Before each flight, the MSG RECORD file of previous flight should be erased.*

Ident.: DSC-46-10-10-30-00021253.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AUTO-CLOSING

The message closes and the system automatically removes the message from the DCDU, 5 s after the ATC center successfully receives the message.
Clearance messages and messages, related to loss of communication or datalink transmission error, do not close automatically, when sent or received by the ATC. The flight crew must close these messages by pressing the CLOSE key, on the DCDU. Closing the message will remove the message from the DCDU screen.

Intentionally left blank

General

GENERAL

Ident.: DSC-46-10-20-10-00021044.0001001 / 21 MAR 17
Applicable to: ALL

The AOC applications ◁ are datalink applications. The AOC applications enable an exchange of specific messages between the flight crew and the Airline Operational Control (AOC).
The AOC applications are customized by each operator and depend on operator's choices and the datalink service provider.

Note: *Details about AOC applications cannot be provided due to the wide range of customization by the operator.*
Airbus does not supervise customization of AOC applications. It is recommended to insert AOC application description into this chapter in accordance with AOC applications installed on the aircraft.

The AOC application can offer the following functions:

EXAMPLE

- Preflight Functions:
  - Flight log
  - Departure Delay Message
  - Takeoff Delay Message
  - Weather Request
  - NOTAM Request
  - Loadsheet Request
  - Others
- En-Route Functions:
  - Flight log
  - Diversion Message
  - En-route Delay
  - Estimated Time of Arrival (ETA) Message
  - Weather Request
  - NOTAM Request
  - Others
- Postflight Functions:
  - Flight log
  - Flight summary
  - Gate delay
  - Others

The flight crew uses the datalink cockpit interface for the AOC applications.

EXAMPLE	**Flight Plan Modification** This flight plan modification example is based on following assumptions: - The AOC sends a flight plan modification message to the flight crew. - The flight crew loads the fight plan modification in the FMGES, into the secondary F-PLN. - The crew obtains ATC clearance before activating the modified flight plan. - *Refer to DSC-46-10-50 How to Modify FLT Plan* for the flight plan modification based on an AOC request.

Notifications

NOTIFICATION

Ident.: DSC-46-10-30-10-00021184.0001001 / 21 MAR 17
Applicable to: ALL

The Notification application enables the flight crew to send a notification message to an ATC center, if the datalink system is correctly initialized.
Refer to DSC-46-10-50 How to Initialize for more information about datalink initialization.
The flight crew must notify the ATC center, from 15 min to 45 min, before entering the ATC area.
The flight crew notifies a desired ATC center via the NOTIFICATION page of the MCDU .
However, ATC centers initiate automatic notification, when the aircraft flies from one ATC area to another.

Note: *The ATC center initiates a CPDLC connection, when the flight crew sends the notification. The NOTIFICATION page of the MCDU will display XXXX NOTIFIED HH MM Z). Therefore, it is not necessary to repeat notifications to the ATC center.*

The notification procedure enables the ATC to correlate the aircraft with the ICAO flight number.

Note: *The FMGEC provides the FLT number.*

Consequently, it is essential to enter, into the FMGEC, via the INIT page of the MCDU, the same flight number as the flight number, indicated on the ICAO flight plan (with the same number of letters).
Optional datalink applications ◁ (departure clearance, oceanic clearance and D-ATIS) do not require previous notifications, or connection to an ATC center.

Optional datalink applications are based on voice exchanges:
1. Request - crew requests
2. Clearance - ground clears
3. Read-back - crew reads back
4. Confirmation - ground confirms.

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Controller/Pilot Datalink Communication (CPDLC)

GENERAL

Ident.: DSC-46-10-30-20-10-00021177.0001001 / 21 MAR 17
Applicable to: ALL

The CPDLC application enables an exchange of specific ATC messages between the flight crew and air traffic controller.
The air traffic controller initiates the CPDLC connection with the aircraft, after the reception of a notification message from the flight crew.

Note: *When the aircraft flies from one air traffic control area to another, the CPDLC ensures an automatic transfer of ATC centers.*

The flight crew and air traffic controller use a set of predefined messages to build datalink messages. The flight crew and air traffic controller can also send freetext datalink messages. Freetext messages can only be used, when pre-formatted datalink messages do not allow to send the information.

Note: *The freetext message does not allow the datalink system to generate automatic pre-formatted answer.*
The freetext message must contain standard ATC phraseology and standard abbreviations.

The CPDLC application enables the flight crew to answer following uplink messages via the DCDU:
- Clearance
- Report request
- Negotiation message
- Information message.

Ident.: DSC-46-10-30-20-10-00021254.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The CPDLC application supports the following functions:
- Connection (*Refer to DSC-46-10-30-20 Connection*)
- Request (*Refer to DSC-46-10-30-20 Request*)
- Report (*Refer to DSC-46-10-30-20 Report*)
- Message Modify (*Refer to DSC-46-10-30-20 Message Modify*)
- MAX Uplink Delay (*Refer to DSC-46-10-30-20 Max Uplink Delay*)
- Emergency (*Refer to DSC-46-10-30-20 Emergency*).

Ident.: DSC-46-10-30-20-10-00021254.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

The CPDLC application supports the following functions:
- Connection (*Refer to DSC-46-10-30-20 Connection*)
- Request (*Refer to DSC-46-10-30-20 Request*)

- Report (*Refer to DSC-46-10-30-20 Report*)
- Message Modify (*Refer to DSC-46-10-30-20 Message Modify*)
- Emergency (*Refer to DSC-46-10-30-20 Emergency*).

CONNECT

Ident.: DSC-46-10-30-20-00021178.0001001 / 21 MAR 17
Applicable to: ALL

The notified ATC center can initiate a CPDLC connection with the aircraft. This ATC center is then considered as active. The active ATC center appears on the DCDU, and on the MCDU, in the active ATC field of the CONNECTION STATUS page.
Only one ATC center can be active at a time.
During flight, the aircraft may move from one ATC area to another ATC area. The next ATC may anticipate this change. The next ATC center may initiate a passive connection with the aircraft, when the aircraft is still connected to the active ATC. In this case, the next ATC center appears on the DCDU, and on the MCDU, in the next ATC field of the CONNECTION STATUS page. When the ATC area changes, the active ATC center ends the connection with the aircraft, and the next ATC center automatically becomes the active ATC center.
The CONNECTION STATUS page of the MCDU displays ICAO codes of both, the active and the next (if any) ATC centers. The flight crew can manually disconnect the ATC centers via the CONNECTION STATUS page.
Refer to DSC-46-10-40-30 CONNECTION STATUS for information about the CONNECTION STATUS page.

REQUEST

Ident.: DSC-46-10-30-20-00021179.0001001 / 28 NOV 17
Applicable to: ALL

The flight crew can request a clearance or information from the air traffic controller.
The MCDU enables the flight crew to create:

- Lateral Request
  The flight crew can prepare request messages associated with lateral trajectory changes on the ATC LAT REQ page.
- Vertical Request
  The flight crew can prepare request messages associated with vertical trajectory changes on the ATC VERT REQ page.

- WHEN CAN WE EXPECT Request
  The flight crew can prepare negotiation messages associated with altitude or speed flight parameters on the WHEN CAN WE EXPECT page.
- Other Request
  The flight crew can prepare messages to request clearance, own separation and voice contact on the ATC OTHER REQ page.

The flight crew can add a freetext to a request if a justification is required, or the pre-formatted layout of message does not enable to send the information.

Note: *Requests of the departure clearance, oceanic clearance and ATIS are not part of the CPDLC application.*

POSITION REPORT

Ident.: DSC-46-10-30-20-00021180.0001001 / 21 MAR 17
Applicable to: ALL

The REPORT function provides ATC with information about the aircraft position, trends (climb, speed, descent, heading, track,) and other requested parameters.
The flight crew prepares report messages on the MCDU, on the ATC REPORTS page.
The ATC REPORTS page enables the flight crew to:

- Set position report messages
- Access BACK-ON-ROUTE REPORT page
- Modify REPORT messages
- Create a freetext message
- Add freetext to a report message

When the flight crew positively answers report request, the FMGEC monitors associated parameters. As a result, the DCDU displays a reminder message, when monitored parameter satisfies the condition.
When the flight crew positively answers deferred clearance or conditional clearance message, the DCDU displays a reminder message before the clearance expiry.

POSITION REPORT

The flight crew reports position, when requested, and/or when the waypoint is sequenced.
The flight crew can report the aircraft position to the active ATC center manually, or automatically:

- MANUAL POS REPORT
  The flight crew prepares the manual position report, on the POSITION REPORT page.
  Mandatory and optional parameters of the position report can be filled by FMGES, or the flight crew.
- AUTO POS REPORT
  Position report message appears on the DCDU, if waypoints are sequenced correctly in the FMGES.
  The flight crew may activate the automatic position report on the ATC REPORTS page.

Note: *Independently from the CPDLC position reporting, the ADS-C also reports the aircraft position automatically.*

BACK ON ROUTE

The flight crew may deviate from a clearance to fly an initial route, due to offset route or weather.
The flight crew sends back-on-route message to the air traffic controller, when the initial route is resumed.

Note: *The FMGEC cannot monitor the back-on-route situation.*

MSG MODIFY

Ident.: DSC-46-10-30-20-00021181.0001001 / 04 JUN 19
Applicable to: ALL

The Message Modify function enables the flight crew to modify automatic replies that the CPDLC generates, in accordance with specific requests from the ATC.

Via the DCDU, the CPDLC application may automatically propose a response to:
- Confirm request (position, speed, heading, altitude, ...)
- Report request (position reports, altitude, ...)
- Open negotiation request (When can you accept altitude, speed, ...?)
- A combination of the above requests.

The MESSAGE MODIFY page appears automatically on the MCDU if the MODIFY function key is pressed on the DCDU and the corresponding MCDU displays an ATC page.

Note: *Pressing MODIFY also triggers MCDU FOR MODIF/MCDU FOR EDIT indication, in the message information area, on the DCDU.*

When the flight crew opens the MESSAGE MODIFY page for the first time, all modifiable fields are automatically updated with FMGES data.
The flight crew can add a freetext to the message, if a justification is required, or if a specific additional information is requested by the air traffic controller.
Refer to DSC-46-10-40-20 Message Information Area for information about indications on the DCDU.

Refer to DSC-46-10-40-30 MSG MODIFY for information about MESSAGE MODIFY page.

MAX UPLINK DELAY

Ident.: DSC-46-10-30-20-00021182.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Max Uplink Delay function enables the ATC datalink to reject (without a notice to the flight crew) any CPDLC uplink messages, if the delay between ground emission and onboard reception exceeds the time, specified in the MAX UPLINK DELAY of the MAX UPLINK DELAY page on the MCDU.
The max uplink delay is the maximum delay that is authorized for an ATC answer. By default, the value of the max uplink delay is set to NONE. This setting means that datalink messages are not rejected, due to a too long transmission time.
The air traffic controller defines the value of the maximum uplink delay. The ground system can automatically uplink the value of the delay in a specific freetext message.
On the ATC request, the flight crew must modify the maximum uplink delay value via the MAX UPLINK DELAY page on the MCDU.

CAUTION	Do not enter any value in the MAX UPLINK DELAY entry field unless requested by the air traffic controller.

Note: *The MAX UPLINK DELAY value is reset to NONE, when the connection with the current active ATC center ends.*
If the flight crew receives a message CONFIRM MESSAGE LATENCY TIMER OFF, the flight crew must check that the MAX UPLINK DELAY value is equal to NONE. If the MAX UPLINK DELAY value is no set to NONE, the MAX UPLINK DELAY value must be cleared.

Refer to DSC-46-10-40-30 MAX UPLINK DELAY for more information about MAX UPLINK DELAY page.

EMERGENCY

Ident.: DSC-46-10-30-20-00021183.0001001 / 21 MAR 17
Applicable to: ALL

The EMERGENCY page enables the flight crew to:
- Create an emergency datalink message
- Activate the ADS-C Emergency.

The flight crew can switch the ADS-C to emergency mode manually via the EMERGENCY page of the MCDU,
The ADS-C switches to the emergency mode automatically, when the flight crew sends a MAYDAY message.

The flight crew can add a freetext to the emergency message, if additional information can be provided.

Automatic Dependent Surveillance-Contract (ADS-C)

ADS-CONTRACT

Ident.: DSC-46-10-30-30-00021176.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Automatic Dependent Surveillance – Contract (ADS-C) application provides information and surveillance data reports to one or more connected ATC centers. This activity is automatic and transparent to the flight crew.

Note: *Therefore, the ADS-C reporting does not require a flight crew action, datalink notification, and/or an initiation of CPDLC application.*

The air traffic controller defines the content and the frequency of the reports.
The ATC center initiates the ADS-C connection provided that, the ADS-C status of the aircraft is armed or connected. The flight crew can check the status of ADS-C on the MCDU, on the CONNECTION STATUS page.

The ADS-C may have the following status:
- Armed
  The ADS-C function is armed by default. If the ADS-C is armed, up to 5 ATC centers can connect. Connection is at the ATC's discretion. When one ATC center is connected, the ADS-C status changes from armed to connected.
- Connected

  When an ATC center is connected to the ADS-C:
  - The CONNECTION STATUS page, on the MCDU indicates the connected status of the ADS-C
  - The ADS-C DETAIL page/ADS DETAIL page, on the MCDU provides a list of all ADS-C connected centers
  - The DCDU indicates the number of ADS-C connected centers in the DCDU default screen.
- Off
  All active ADS-C connections stop, and the ADS-C connection cannot be established from the ground, by ATC center.
  The flight crew can set the ADS-C to off via the CONNECTION STATUS page.

  Note: *The ADS-C should not be turned off, unless the flight crew is instructed to do so (for example, via an ATC request).*

ADS-CONTRACT

Ident.: DSC-46-10-30-30-00021176.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

The Automatic Dependent Surveillance – Contract (ADS-C) application provides information and surveillance data reports to one or more connected ATC centers. This activity is automatic and transparent to the flight crew.

Note: Therefore, the ADS-C reporting does not require a flight crew action, datalink notification, and/or an initiation of CPDLC application.

The air traffic controller defines the content and the frequency of the reports.
The ATC center initiates the ADS-C connection provided that, the ADS-C status of the aircraft is armed or connected. The flight crew can check the status of ADS-C on the MCDU, on the CONNECTION STATUS page.

The ADS-C may have the following status:

- On
  The ADS-C function is set on by default. An ATC center can connect.
- Off
  All active ADS-C connections stop, and the ADS-C connection cannot be established from the ground, by ATC center.
  The flight crew can set the ADS-C to off via the CONNECTION STATUS page.

  Note: The ADS-C should not be turned off, unless the flight crew is instructed to do so (for example, in an ATC request).

Departure Clearance (DCL)

DEPARTURE CLEARANCE

Ident.: DSC-46-10-30-40-00021175.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Departure Clearance (DCL) application enables the flight crew to request and obtain departure information and clearance from the ATC center.

The DCL application is initiated by:
- The flight crew, when sending a DCL request
  Refer to DSC-46-10-50 Request for information about how to request DCL.
- The ATC center, when sending a DCL clearance to the aircraft without a request.

Consequently, the flight crew receives the clearance, reads back the clearance and receives the read-back confirmation from the ATC.

DEPARTURE CLEARANCE RECEPTION

A new message triggers visual (ATC MSG light) and aural alerts. The DCDU displays the new message in an open status, on a blue background.
Refer to DSC-46-10-50 Reception for information about how to receive DCL.

DEPARTURE CLEARANCE READ-BACK

The flight crew can acknowledge or refuse the departure clearance.
Refer to DSC-46-10-50 Read-Back for information about how to read-back DCL.

DEPARTURE CLEARANCE READ-BACK CONFIRMATION

A new read-back confirmation message triggers visual (ATC MSG light) and aural alerts.
Refer to DSC-46-10-50 Confirmation of DCL Read-Back for information about how to read-back DCL confirmation.

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Oceanic Clearance (OCL)

OCEANIC CLEARANCE

Ident.: DSC-46-10-30-50-00021174.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Oceanic Clearance (OCL) application enables the flight crew to request and obtain an oceanic clearance from the Oceanic ATC center, before entering an oceanic airspace.

The OCL application can be initiated by:
- The flight crew, when sending an OCL request via the MCDU
  Refer to DSC-46-10-50 Request for information about how to request OCL.
- The ATC center, when sending an OCL clearance to the aircraft without a request.

Consequently, the flight crew receives the clearance, reads back the clearance and receives the read-back confirmation from the ATC.

OCEANIC CLEARANCE RECEPTION

A new message triggers visual (ATC MSG light) and aural alerts. The DCDU displays the new message in an open status, on a blue background.
Refer to DSC-46-10-50 Reception for information about how to receive OCL.

OCEANIC CLEARANCE READ-BACK

The flight crew can acknowledge or refuse the oceanic clearance.
Refer to DSC-46-10-50 Read-Back for information about how to read-back OCL.

OCEANIC CLEARANCE READ-BACK CONFIRMATION

A new read-back confirmation message triggers visual (ATC MSG light) and aural alerts.
Refer to DSC-46-10-50 Confirmation of OCL Read-Back for information about how to read-back OCL confirmation.

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Digital-Automatic Terminal Information System (D-ATIS)

DIGITAL - ATIS

Ident.: DSC-46-10-30-60-00021173.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Digital Automatic Terminal Information Service (D-ATIS) enables the flight crew to request and obtain information about airports.

Note: *The D-ATIS may not be available for all airports. Terminal charts usually indicate when the D-ATIS is available.*

The flight crew can request information for departure, destination, and alternate airports via the ATIS MENU page of the MCDU.
When initially accessing the ATIS MENU page, the application automatically fills in the airport names and type of the ATIS areas with departure, arrival and alternate airport names (if they are entered via the FMS). The departure type indicator (DEP) is automatically associated to the departure airport request. The arrival type indicator (ARR) is automatically associated to the destination and the alternate airport requests.
To make a request for another airport than the one automatically filled, enter the ICAO code of the airport in one of the areas.

The flight crew requests ATIS reports:
- Manually
  Refer to DSC-46-10-50 Manual Request for more information.
- Automatically
  Refer to DSC-46-10-50 Auto-Update Request for more information.

The AUTO-UPDATE function automatically provides ATIS reports of arrival airports only when a new version is available.
The AUTO-UPDATE CANCEL function enables to deactivate the AUTO-UPDATE function.

Note: *Once the auto-update function is cancelled, the REQ SEND function, related to the arrival airport, becomes available. The flight crew can still send an ATIS report request to the related arrival airport manually.*

The flight crew receives ATIS reports on:

- The MCDU,
  Refer to DSC-46-10-50 Reception for more information about a display of received ATIS.

  Note: *ATIS reports are received in the MCDU, contrary to other ATC datalink applications that receive messages in the DCDU.*
- The printer
  When the automatic print is selected on the ATIS MENU page, the ATIS information is sent directly to the printer.

Message Record

MESSAGE RECORD

Ident.: DSC-46-10-30-70-00021172.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The Message Record application enables to store datalink messages. The flight crew can display the recorded messages at any time.
When the flight crew closes a message on the DCDU, the message is stored and disappears from the DCDU.
The messages are stored in chronological order and grouped by flight number. When the maximum number of stored messages is reached (up to 99 messages), any new message will be stored and the oldest message will be deleted.
The flight crew can access the stored message via the MSG RECORD page of the MCDU.

Note: *1. The flight crew can print recorded messages.*
2. The flight crew can erase all recorded messages.
3. The ADS-C ◁ reports are not stored.

MESSAGE RECORD/LOG

Ident.: DSC-46-10-30-70-00021172.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

The Message Log application enables to store datalink messages. The flight crew can display the recorded messages at any time.
When the flight crew closes a message on the DCDU, the message is stored and disappears from the DCDU.
The messages are stored in chronological order and grouped by flight number. When the maximum number of stored messages is reached (up to 99 messages), any new message will be stored and the oldest message will be deleted.
The flight crew can access stored message via the MSG LOG page of the MCDU.

Note: *1. The flight crew can print recorded messages.*
2. The flight crew can erase all recorded messages.
3. The ADS-C ◁ reports are not stored.

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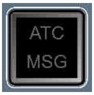
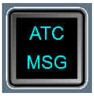
ATC Message Pushbutton (ATC MSG PB)

ATC MSG PB

Ident.: DSC-46-10-40-10-00021073.0001001 / 21 MAR 17
Applicable to: ALL



No datalink message from the ATC center was received.



Flashes when a datalink message from the ATC center is received, or a reminder message is received. When a message is received, the DCDU automatically displays the message on the screen.
Associated with audio alert.
When the flight crew presses one of the two ATC MSG pbs, the ATC MSG lights go off and the aural alert associated with the reception of the message is cancelled.

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Datalink Control and Display Unit (DCDU)

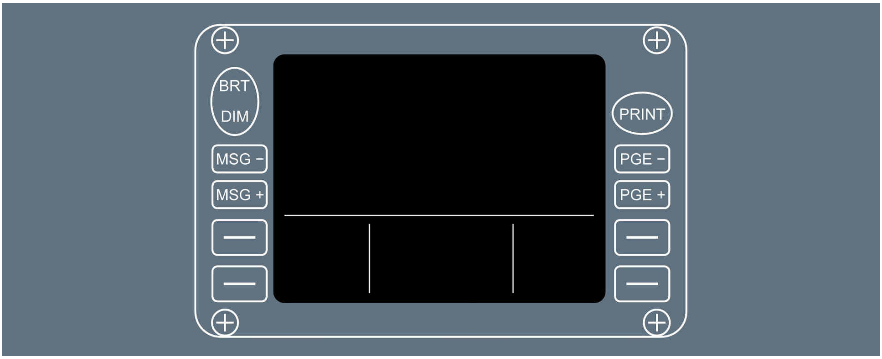
DCDU

Ident.: DSC-46-10-40-20-10-00021072.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

- **If datalink connection is not established:**

  By default, the DCDU displays no information. The DCDU screen is black without information.

DCDU Screen with No Datalink Connection

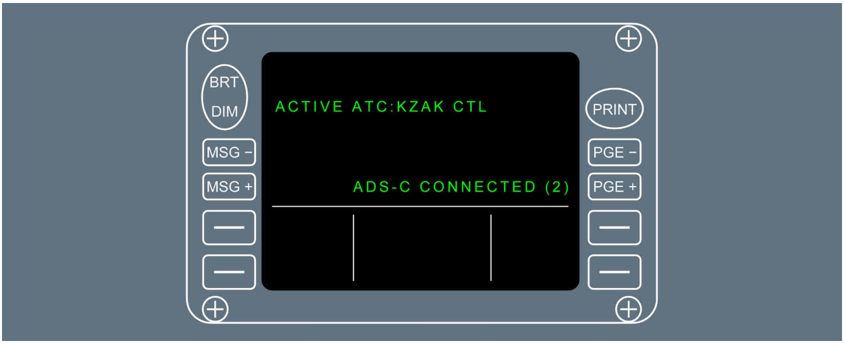


- **If datalink connection is established:**
  - **If no datalink message is displayed on the DCDU:**

    By default, the DCDU displays:
    - ACTIVE ATC and the active ATC ICAO code
    - NEXT ATC and the next ATC ICAO code, if the active ATC initiated an automatic transfer to a next ATC
    - ADS-C status, when the ADS-C is set to OFF
    - ADS-C CONNECTED (X), if an ADS-Contract ◁ is established with ATC center(s)
      (X) : Displays the number of ADS-C active connections, when at least one ATC center is connected
    - NO ATC DLK/ATC DISCONNECTED, when the datalink connection is lost.

EXAMPLE	The DCDU default screen, when the datalink is connected and no message is displayed on the screen:

DCDU Screen with Datalink Connected and No Datalink Message Displayed

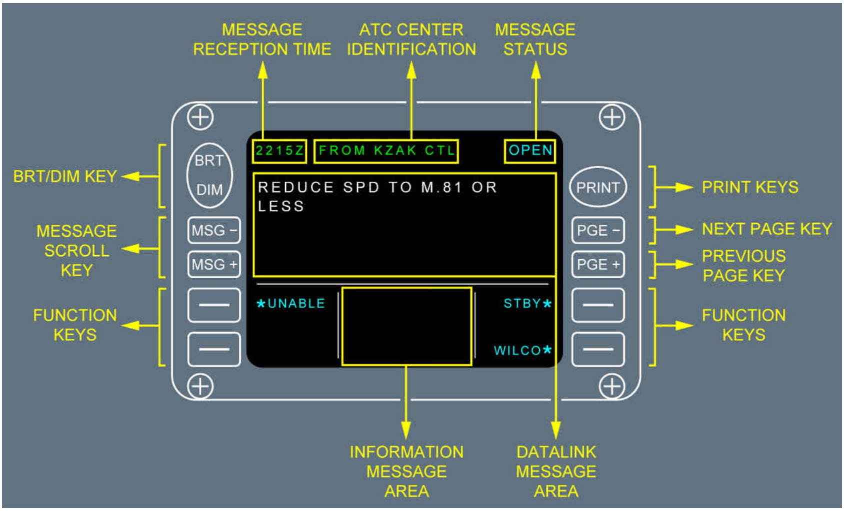

ACTIVE ATC:KZAK CTL

ADS-C CONNECTED (2)

BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +

- **If a datalink message is displayed on the DCDU:**

DCDU Screen with Datalink Connected and Datalink Message Displayed


2215Z FROM KZAK CTL OPEN

REDUCE SPD TO M.81 OR LESS

UNABLE STBY

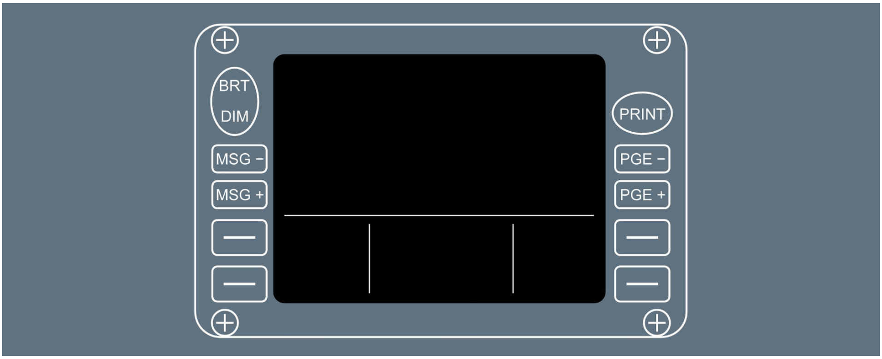
WILCO*

MESSAGE RECEPTION TIME
ATC CENTER IDENTIFICATION
MESSAGE STATUS
BRT/DIM KEY
MESSAGE SCROLL KEY
FUNCTION KEYS
PRINT KEYS
NEXT PAGE KEY
PREVIOUS PAGE KEY
FUNCTION KEYS
INFORMATION MESSAGE AREA
DATALINK MESSAGE AREA
BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +

Ident.: DSC-46-10-40-20-10-00021072.0002001 / 31 AUG 17
Applicable to: LV-GKO, LV-GKP

- **If datalink connection is not established:**
  By default, the DCDU displays no information. The DCDU screen is black without information.

DCDU Screen with No Datalink Connected



■ If datalink connection is established:

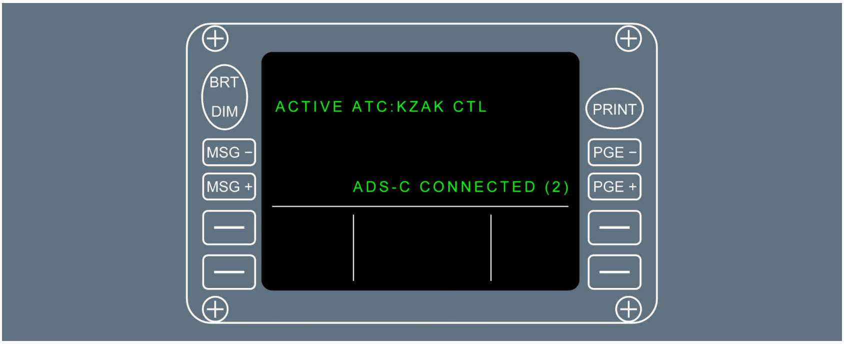
● If no datalink message is displayed on the DCDU:

By default, the DCDU displays:

- ACTIVE ATC and the active ATC ICAO code
- NEXT ATC and the next ATC ICAO code, if the active ATC initiated an automatic transfer to a next ATC
- ADS-C status, when the ADS-C is set to OFF
- ADS-C CONNECTED (X), if an ADS-Contract is established with ATC center(s)
  (X) : Displays the number of ADS-C active connections, when at least one ATC center is connected
- NO ATC DLK/ATC DISCONNECTED, when the datalink connection is lost.

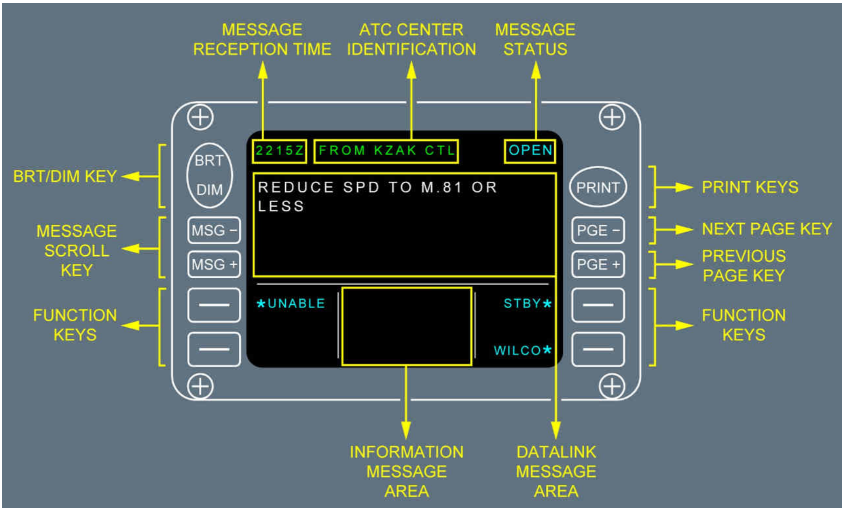
EXAMPLE	The DCDU default screen, when the datalink is connected and no message is displayed on the screen:

DCDU Screen with Datalink Connected and No Datalink Message Displayed


BRT
DIM
MSG –
MSG +
ACTIVE ATC:KZAK CTL
ADS-C CONNECTED (2)
PRINT
PGE –
PGE +

- **If a datalink message is displayed on the DCDU:**

DCDU Screen with Datalink Connected and Datalink Message Displayed


MESSAGE RECEPTION TIME
ATC CENTER IDENTIFICATION
MESSAGE STATUS
2215Z
FROM KZAK CTL
OPEN
REDUCE SPD TO M.81 OR LESS
*UNABLE
STBY*
WILCO*
BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +
BRT/DIM KEY
MESSAGE SCROLL KEY
FUNCTION KEYS
PRINT KEYS
NEXT PAGE KEY
PREVIOUS PAGE KEY
FUNCTION KEYS
INFORMATION MESSAGE AREA
DATALINK MESSAGE AREA

Ident.: DSC-46-10-40-20-10-00021163.0001001 / 31 AUG 17
Applicable to: ALL

DATALINK MESSAGE AREA

Displays uplink and downlink messages.

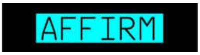
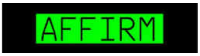
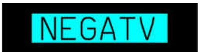
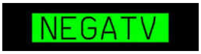
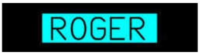
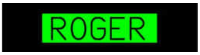
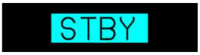
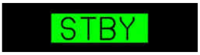
Uplink messages are displayed on a black background, and:
- When received, the message appears in white and the main parameters in cyan.
- When answered, the message becomes green.
- When monitored, a parameter appears in magenta (This indicates that the FMGES monitors this parameter).
  If the monitoring fails, this parameters become amber.
  When the value is attained, this parameter becomes green.
- If the loading of the clearance in the secondary flight plan fails, parameters appear in amber.

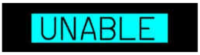
Downlink messages appear in black:
- On a cyan background before sending
- On a green background while and after sending.

Ident.: DSC-46-10-40-20-10-00021164.0001001 / 21 MAR 17
Applicable to: ALL

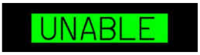
MESSAGE STATUS

Indicates the status of the message or the response of the flight crew to a message received from the active ATC center.

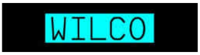
 AFFIRM	The status of the message changes to AFFIRM, when the flight crew selects a positive answer to the ATC uplink message on the DCDU.
 AFFIRM	The status of the message changes to AFFIRM, when the flight crew sends a positive answer to the ATC center.
 NEGATV	The status of the message changes to NEGATV, when the flight crew selects a negative answer to the ATC uplink message on the DCDU.
 NEGATV	The status of the message changes to NEGATV, when the flight crew sends a negative answer to the ATC center.
 ROGER	The status of the message changes to ROGER, when the flight crew selects ROGER, in order to inform the ATC center that they received and understood the uplink message.
 ROGER	The status of the message changes to ROGER, when the flight crew sends a ROGER answer to the ATC center.
 STBY	The status of the message changes to STBY, when the flight crew selects STBY, in order to inform the ATC center that they need time to answer the uplink message.
 STBY	The status of the message changes to STBY, when the flight crew sends a STBY answer to the ATC center.


UNABLE

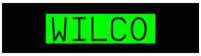
The status of the message changes to UNABLE, when the flight crew selects UNABLE, in order to inform the ATC center that they cannot comply with the request.


UNABLE

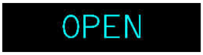
The status of the message changes to UNABLE, when the flight crew sends a UNABLE answer to the ATC center.


WILCO

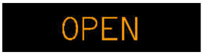
The status of the message changes to WILCO, when the flight crew selects WILCO, in order to inform the ATC center that they understood the request and that they will comply with it.


WILCO

The status of the message changes to WILCO, when the flight crew sends a WILCO answer to the ATC center.

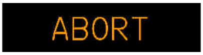

OPEN

Indicates that the received uplink message requires a response. The status OPEN remains until the flight crew answers the uplink message.


OPEN

Indicates that:

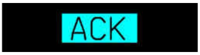
- The flight crew did not answer the uplink message in due time, or
- The flight crew sent a downlink or a response message, but no acknowledgment from the ground was received.


ABORT

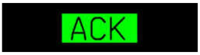
Indicates that a disconnection occurred during a pending uplink or downlink message.

Note: *The status field remains empty for:*
- *A downlink message sent to the active ATC center*
- *An uplink message for which no response is expected.*

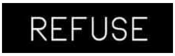
Ident.: DSC-46-10-40-20-10-00021165.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


ACK

The status of the message changes to ACK, when the flight crew selects ACK, in order to acknowledge a departure/oceanic clearance.


ACK

The status of the message changes to ACK, when the flight crew sends a ACK answer to the ATC center.


REFUSE

The status of the message changes to REFUSE, when the flight crew selects REFUSE, in order to refuse a departure/oceanic clearance. The message CONTACT ATC BY VOICE - REFUSE NOT SUPPORTED - BY DATALINK appears in the datalink message area, in order to inform the flight crew that they must use voice radio communication to refuse the clearance.

Ident.: DSC-46-10-40-20-10-00021166.0003001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

FUNCTION KEYS

Depending on the nature of the message, the system automatically displays an appropriate function by each function key.

Possible unctions are detailed below.

AFFIRM : When selected, prepares an affirmative response to accept an ATC negotiation message (e.g. CAN YOU ACCEPT [altitude] AT [time]).

CANCEL : When selected, enables the flight crew to:
- Remove a prepared downlink message from the DCDU
- Cancel a selected reply to an uplink message.

CANNOT : When selected, prepares a negative answer to an OPEN negotiation message from the ATC.

CLOSE : When selected, erases a message (from the DCDU screen) that was sent to the ATC, or erases a message from the ATC that was answered. This message is stored in the MSG RECORD. This is not applicable when the answer is on stand-by (STBY).

LOAD : When selected, loads a flight plan from the ATC, or a parameter time constraint, into the secondary flight plan.

MODIFY : When selected, accesses the MESSAGE MODIFY page or POSITION REPORT page on the MCDU, in order to modify a message proposed by the FMGES. MODIFY also enables to update parameters that the FMGES provides to the DCDU.

NEGATV : When selected, prepares a negative response to an ATC message.

RECALL : When selected, recalls the most recently closed message if it was closed within the last 5 min. If the flight crew selects the RECALL more than 5 min after the last message was closed, the following message appears:

RECALL EMPTY
CONSULT MSG RECORD

ROGER : When selected, confirms the reception, and understanding of ATC information or report request.

SEND : When selected, sends a message or an answer, that was prepared by using other function keys (Example: WILCO, ROGER, AFFIRMATIVE, STBY, ...).

STBY : When selected, informs the ATC that the flight crew needs to delay the answer.

UNABLE : When selected, rejects an ATC clearance.

WILCO : When selected, accepts an ATC clearance.

* : The function keys are operative, if an asterisk or a function is visible.

Ident.: DSC-46-10-40-20-10-00021166.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

FUNCTION KEYS

Depending on the nature of the message, the system automatically displays an appropriate function by each function key.

Possible unctions are detailed below.

AFFIRM : When selected, prepares an affirmative response to accept an ATC negotiation message

ANSWER : When selected, splits a datalink message, including several questions, into different messages.

CAN : When selected, prepares a positive answer to an OPEN negotiation message from the ATC (Ex: When can you.... ?).

CANCEL : When selected, enables the flight crew to:
- Remove a prepared downlink message from the DCDU
- Cancel a selected reply to an uplink message.

CANNOT : When selected, prepares a negative answer to an OPEN negotiation message from the ATC.

CLOSE : When selected, erases a message (from the DCDU screen) that was sent to the ATC, or erases a message from the ATC that was answered. This message is stored in the MSG LOG. This is not applicable when the answer is on stand-by (STBY).

LOAD : When selected, loads a flight plan from the ATC, or a parameter time constraint, into the secondary flight plan.

MODIFY : When selected, accesses the MESSAGE MODIFY page or POSITION REPORT page on the MCDU, in order to modify a message proposed by the FMGES. MODIFY also enables to update parameters that the FMGES provides to the DCDU.

NEGATV : When selected, prepares a negative response to an ATC message.

OTHER : When selected, displays the other functions that could be applicable to the current message, but are not currently displayed.

RECALL : When selected, recalls the last message that was removed from the screen, using the CLOSE function.

ROGER : When selected, confirms the reception, and understanding of ATC information or report request.

SEND : When selected, sends a message or an answer, that was prepared by using other function keys (e.g.: WILCO, ROGER, AFFIRMATIVE, STBY, ...).

STBY : When selected, informs the ATC that the flight crew needs to delay the answer.

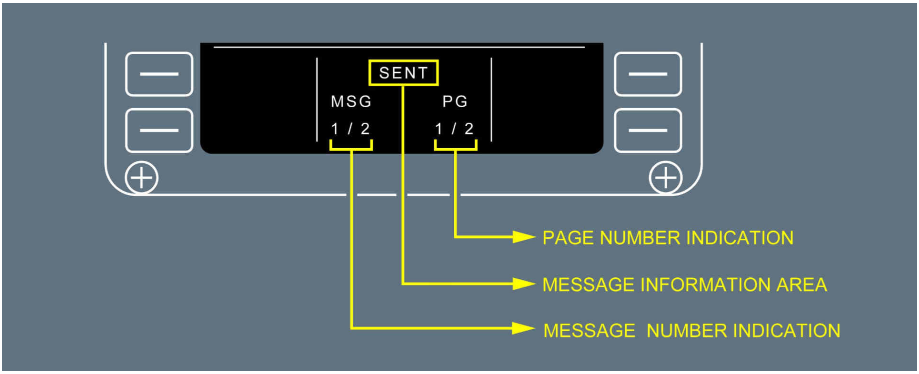
UNABLE : When selected, rejects an ATC clearance.

WILCO	:	When selected, accepts an ATC clearance.
*	:	The function keys are operative, if an asterisk or a function is visible.

Ident.: DSC-46-10-40-20-10-00021167.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ACK	:	When selected, prepares a response message to accept a departure/oceanic clearance message.
REFUSE	:	When selected, prepares a response message to send a negative answer to a departure/oceanic clearance message.

Ident.: DSC-46-10-40-20-10-00021168.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



MESSAGE NUMBER INDICATION

Indicates the rank of the message that is displayed on the DCDU.
If there is only one message on the DCDU, the message number information does not appear in the information field. In the case of a new message reception, the message number indication flashes.

PAGE NUMBER INDICATION

Indicates the page number of the message that is displayed on the DCDU.
If the message contains only one page, the page number information does not appear in the information field.

MESSAGE INFORMATION AREA

ANSWER MSG (amber)	:	The maximum number of pending uplink messages is reached.
COM FAULT (amber)	:	The communication means are faulty.

COM NOT AVAIL (amber)	:	The communication means are temporarily not available.
COM NOT INIT (amber)	:	The router is not initialized.
CHECK CLRCE (amber)	:	The response for a positive reminder of a deferred clearance is lost.
FILE FULL (amber)	:	The maximum number of downlink messages, accessible on the DCDUs, is reached.
LINK LOST (amber)	:	The data link connection is abnormally lost.
LOAD FAILED (amber)	:	The loading of the flight plan, contained in the current message, has failed.
LOAD PARTIAL (amber)	:	The loading of the flight plan, contained in the current message, was only partially done.
LOAD SEC OK (white)	:	The loading of the flight plan, contained in the current message, is successful.
LOADING SEC (white)	:	The flight plan, or time constraint, contained in the current message is being loaded in the secondary flight plan of the FMGES.
LOAD UNAVAIL (amber)	:	The loading is not possible.
MCDU FOR TEXT (white)	:	A negative answer for a pending uplink message is initiated.
MCDU FOR MODIF (white)	:	The current message is in modification on the MCDU.
MONIT CNCLD (white)	:	The FMGES monitoring is cancelled.
MONIT FAILED (amber)	:	The requested FMGES monitoring failed to start.
MONIT LOST (amber)	:	The FMGES monitoring is lost.
MONIT UNAVAIL (amber)	:	The FMGES monitoring is not possible.
MONITORING (white)	:	The FMGES monitors the parameter of the current message.
NO ATC REPLY (amber)	:	The ATC center did not answer to the request within 7 min 30 s.
NO FM DATA (white)	:	The FMGES is not able to provide the ATC requested parameters.
NO MORE MSG (white)	:	The minimum/maximum number of accessible messages is reached.
NO MORE PGE (white)	:	The minimum/maximum number of accessible pages is reached.

OVERFLW CLOSED (amber) : The maximum number of non-pending messages is reached, and a new non-pending message is stored in the file.

PARTIAL DATA (white) : The FMGES cannot provide all the ATC requested parameters.

PRINT FAILED (amber) : The printing was requested from the DCDUs and the printing failed.

PRINT UNAVAIL (white) : The printing was requested from the DCDUs, while the printer is not available.

PRINTING (white) : The printing was requested from the DCDUs and the printing is in progress.

RECALL MODE (white) : The last closed message from the DCDU is recalled, if the flight crew presses the "RECALL key" within the last 5 min of the message closure.

REMINDER (white) : The current message was automatically recalled by the FMGES.

SEND FAILED (amber) : The transmission of a reply to an uplink message or of a downlink is not successful.

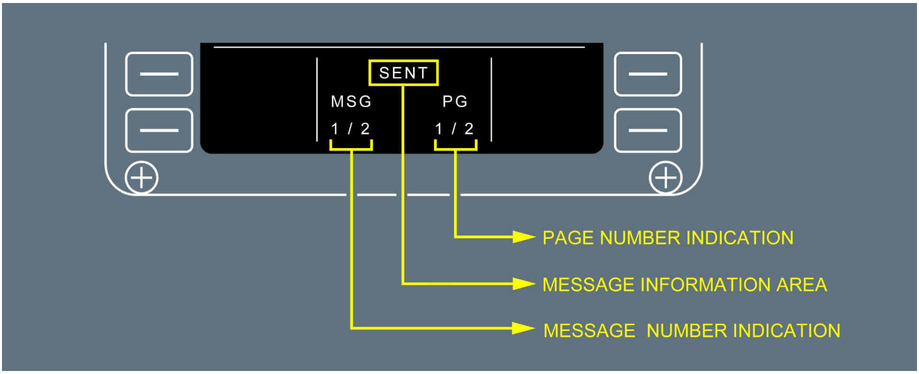
SENDING (white) : The sending of the current message is in progress.

SENT (white) : The current message was sent.

WAIT FM DATA (white) : The FMGES is preparing an answer to the ATC’s request for navigation parameters.

Ident.: DSC-46-10-40-20-10-00021168.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

Message Information Area on the DCDU



MESSAGE NUMBER INDICATION

Indicates the rank of the message that is displayed on the DCDU.
If there is only one message on the DCDU, the message number information does not appear in the information field. In the case of a new message reception, the message number indication flashes.

PAGE NUMBER INDICATION

Indicates the page number of the message that is displayed on the DCDU.
If the message contains only one page, the page number information does not appear in the information field.

MESSAGE INFORMATION AREA

ANSWER MSG (amber) :	Maximum number of pending uplink messages is reached.
FILE FULL (amber) :	Maximum number of downlink messages, accessible on the DCDUs, is reached.
DOWNLINK LOST (amber) :	Transmission of a request is unsuccessful.
LINK LOST (amber) :	Communication with the ATC is unavailable (displayed on any message pending when the loss occurred).
LOAD FAILED (amber) :	The loading of the flight plan, contained in the current message, has failed.

LOAD OK (white)	:	The loading of the flight plan, contained in the current message, was successful.
LOAD PARTIAL (amber)	:	The loading of the flight plan, contained in the current message, was only partially done.
LOAD UNAVAIL (amber)	:	Loading is not possible.
LOADING (white)	:	The flight plan, or time constraint, contained in the current message is being loaded in the secondary flight plan of the FMGES.
MCDU FOR MODIF (white)	:	Follows pressing of the “MODIFY key.
MCDU FOR TEXT (white)	:	Initiation of a negative answer for a pending uplink message.
MONIT CNCLD (white)	:	FMGES monitoring is cancelled.
MONIT FAILED (amber)	:	FMGES monitoring was requested, but failed to start.
MONIT LOST (amber)	:	FMGES monitoring is lost.
MONIT UNAVAIL (amber)	:	FMGES monitoring is not possible.
MONITORING (white)	:	The FMGES is monitoring the parameter of the current message.
NO ATC REPLY (amber)	:	No answer received within 5 min.
NO FM DATA (white)	:	The FMGES is unable to provide the ATC-requested parameters.
NO MORE MSG (white)	:	Follows pressing of the “MSG + “ or “MSG - key, when no more messages are accessible.
NO MORE PGE (white)	:	Follows pressing of the “PGE + or “PGE - key, when no more pages are accessible.
OVERFLW STORED (white)	:	Maximum number of non-pending messages is reached, and a new non-pending message is registered in the file.
PRINT FAILED (amber)	:	Printing was requested from the DCDUs and printing failed.
PRINTING (white)	:	Printing was requested from the DCDUs and printing is in progress.
PRINTING UNAVAIL (white)	:	Printing was requested from the DCDUs, but the printer is unavailable.
RECALL MODE (white)	:	Recalls the last stored message.
REMINDER (white)	:	The current message was automatically recalled by the FMGES.
RESPONSE LOST (amber)	:	Transmission of a reply to an uplink message is unsuccessful.

SENDING (white)	:	The current message is being sent.
SENT (white)	:	The current message was sent.
WAIT FM DATA (white)	:	The FMGES is preparing an answer to the ATC's request for navigation parameters.

Ident.: DSC-46-10-40-20-10-00021169.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

NON STD FORMAT (white)	:	The received uplink for OCL/DCL is partially valid.
NON STD SENDER (white)	:	The received uplink for OCL/DCL is partially valid because the identification of the ATC center is not possible.

Ident.: DSC-46-10-40-20-10-00021170.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

TIME

Indicated time corresponds to the UTC time of:
- *Uplink message*, when the ATC center sent the message.
- *Downlink message*, when the flight crew sent the message to the ATC center.

Note: *If the time when the ATC center sent the message is not available:*
- *No time appears in the TIME area*
- *The "(RECEIVED AT XXXXZ) indication appears at the end of the message, where XXXX is the reception time of the uplink message*
- *If the clock fails, the time area in the answer to an uplink is empty if no time stamp was previously available.*

Ident.: DSC-46-10-40-20-10-00021170.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

TIME

Indicated time corresponds to the time when the DCDU receives the message from the ATC or the FMGES.

Ident.: DSC-46-10-40-20-10-00021171.0001001 / 21 MAR 17
Applicable to: ALL

BRT/DIM KEY

Adjusts the brightness of the DCDU

DESTINATION/ORIGIN ATC CENTER

Indicates the active ATC center that sent or received the message.

MESSAGE SCROLL KEY (MSG- / MSG+)

When pressed, displays the previous/next message in the file.

NEXT/PREVIOUS PAGE KEYS (PGE- / PGE+)

When pressed, displays the previous/next page of the message, if the message cannot be displayed on one single page.

PRINT KEY

Prints the message that is currently displayed on the DCDU.

Intentionally left blank

MCDU Datalink Pages

INTRODUCTION

Ident.: DSC-46-10-40-30-10-00021070.0002001 / 01 MAR 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The MCDU MENU page enables access to datalink pages when the flight crew selects ATSU.
For more information about MCDU MENU page.

The ATSU of the MCDU MENU enables to access ATSU DATALINK page. The ATSU DATALINK page provides a subsequent access to:
- AOC MENU pages

  Note: *Due to the customization of AOC applications by each operator that is not monitored by Airbus, this Controls and Indicators chapter does not contain a description of controls and indicators associated with AOC applications.*

- ATC MENU pages
- COMM MENU pages
- DATALINK STATUS page.

Ident.: DSC-46-10-40-30-10-00021070.0001001 / 01 MAR 18
Applicable to: LV-GKO, LV-GKP

The MCDU MENU page enables access to datalink pages when the flight crew selects ATSU.
For more information about MCDU MENU page.

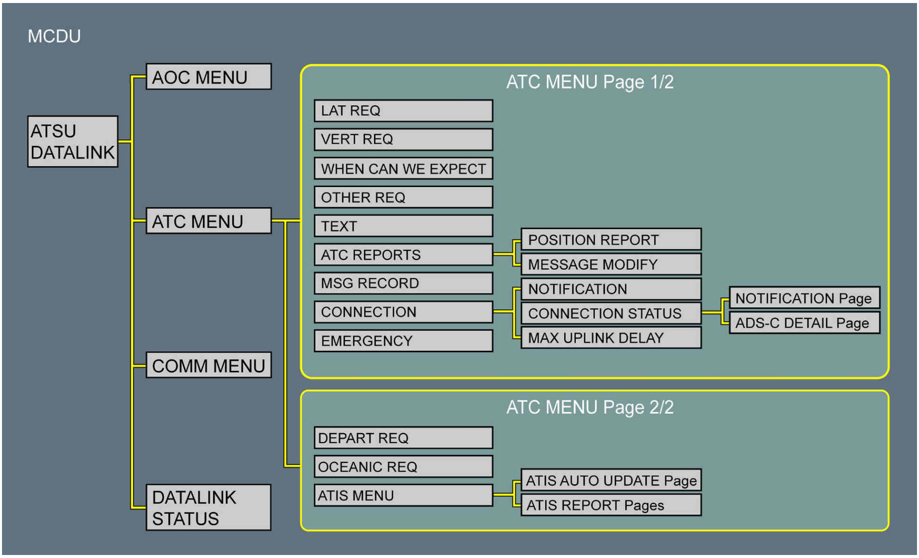
The ATSU of the MCDU MENU enables to access ATSU DATALINK page. The ATSU DATALINK page provides a subsequent access to:
- AOC MENU pages

  Note: *Due to the customization of AOC application by each operator that is not monitored by Airbus, this Controls and Indicators chapter does not contain a description of controls and indicators associated with AOC applications.*

- ATC MENU pages
- COMM pages.

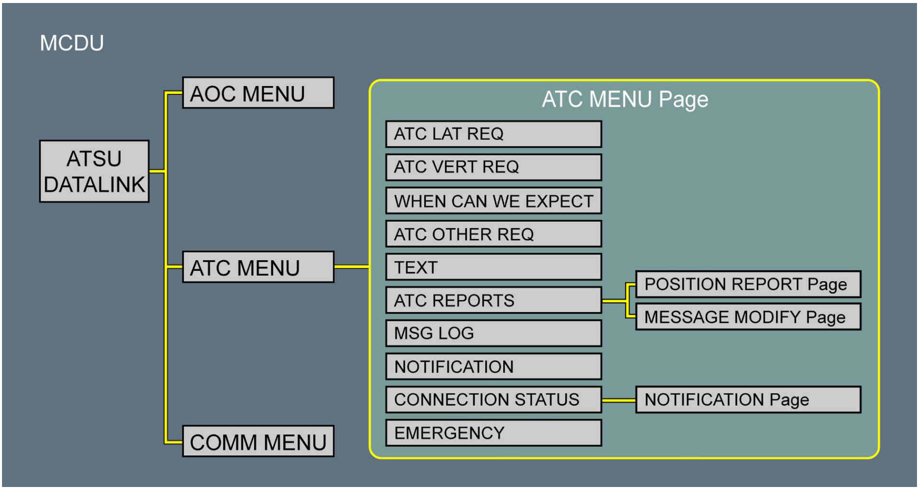
Ident.: DSC-46-10-40-30-10-00021104.0007001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


MCDU
ATSU DATALINK
AOC MENU
ATC MENU
COMM MENU
DATALINK STATUS
ATC MENU Page 1/2
LAT REQ
VERT REQ
WHEN CAN WE EXPECT
OTHER REQ
TEXT
ATC REPORTS
MSG RECORD
CONNECTION
EMERGENCY
POSITION REPORT
MESSAGE MODIFY
NOTIFICATION
CONNECTION STATUS
MAX UPLINK DELAY
NOTIFICATION Page
ADS-C DETAIL Page
ATC MENU Page 2/2
DEPART REQ
OCEANIC REQ
ATIS MENU
ATIS AUTO UPDATE Page
ATIS REPORT Pages

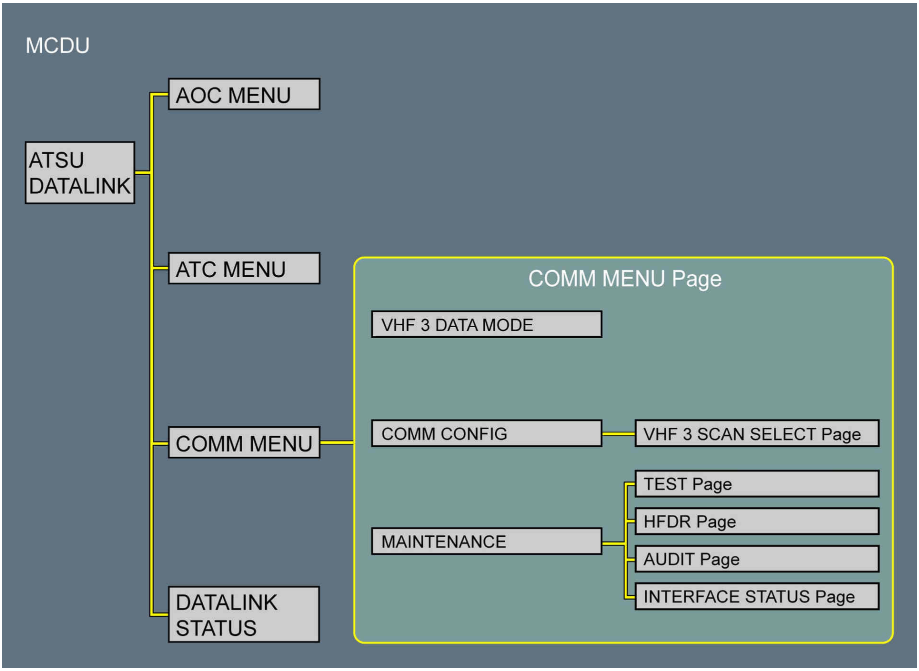
Ident.: DSC-46-10-40-30-10-00021104.0001001 / 21 MAR 17

Applicable to: LV-GKO, LV-GKP

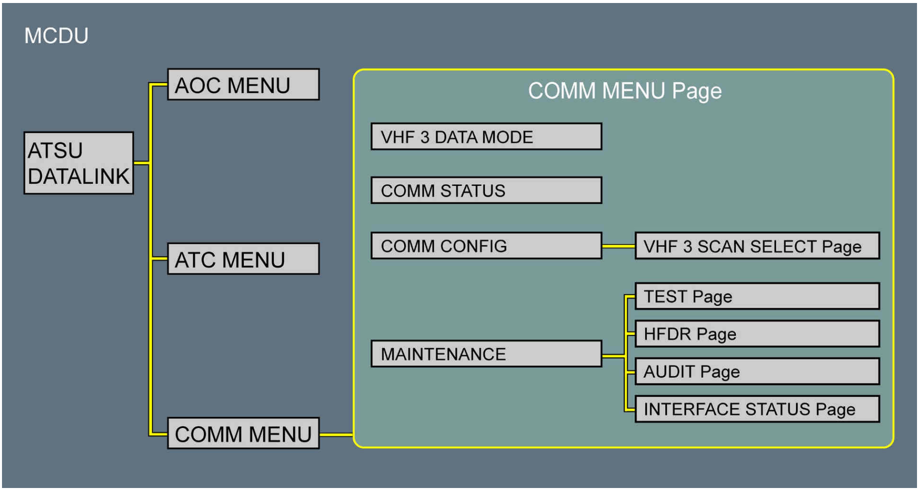

MCDU
ATSU DATALINK
AOC MENU
ATC MENU
COMM MENU
ATC MENU Page
ATC LAT REQ
ATC VERT REQ
WHEN CAN WE EXPECT
ATC OTHER REQ
TEXT
ATC REPORTS
MSG LOG
NOTIFICATION
CONNECTION STATUS
EMERGENCY
POSITION REPORT Page
MESSAGE MODIFY Page
NOTIFICATION Page

Ident.: DSC-46-10-40-30-10-00021295.0002001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

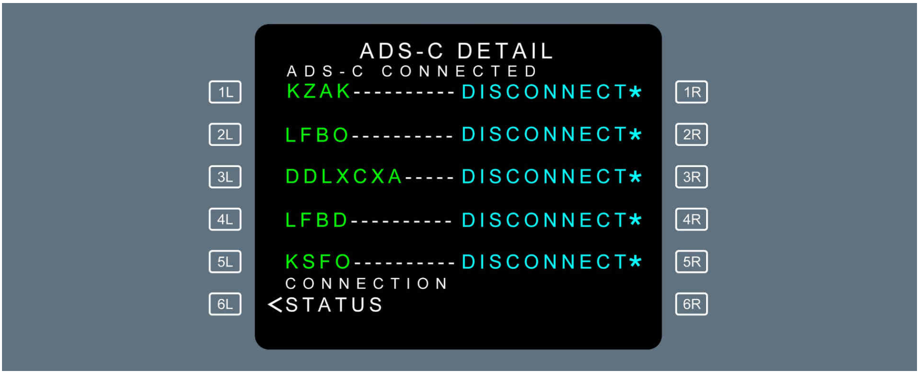

MCDU
ATSU DATALINK
AOC MENU
ATC MENU
COMM MENU
DATALINK STATUS
COMM MENU Page
VHF 3 DATA MODE
COMM CONFIG
VHF 3 SCAN SELECT Page
MAINTENANCE
TEST Page
HFDR Page
AUDIT Page
INTERFACE STATUS Page

Ident.: DSC-46-10-40-30-10-00021295.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP


MCDU
ATSU DATALINK
AOC MENU
ATC MENU
COMM MENU
COMM MENU Page
VHF 3 DATA MODE
COMM STATUS
COMM CONFIG
VHF 3 SCAN SELECT Page
MAINTENANCE
TEST Page
HFDR Page
AUDIT Page
INTERFACE STATUS Page

ADS-C DETAIL

Ident.: DSC-46-10-40-30-00021089.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

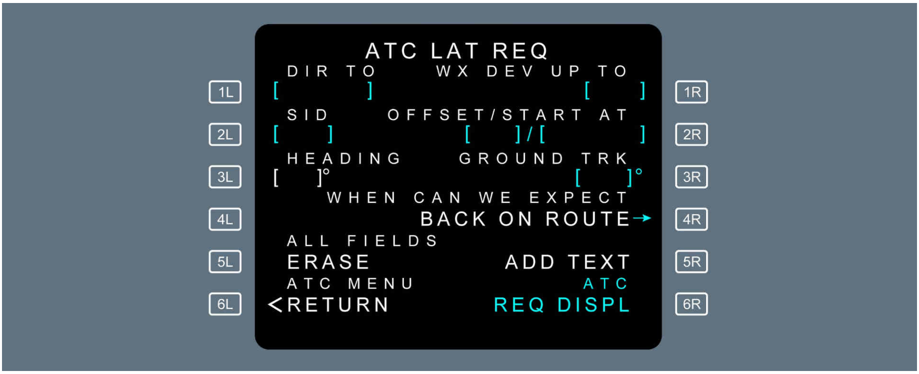
```
ADS-C DETAIL
ADS-C CONNECTED
KZAK----------DISCONNECT*

LFBO----------DISCONNECT*

DDLXCXA-----DISCONNECT*

LFBD----------DISCONNECT*

KSFO----------DISCONNECT*
CONNECTION
<STATUS
```

From [1L] to [4L]	Displays currently ADS-C connected centers.
[6L] CONNECTION STATUS	When selected, the MCDU displays the CONNECTION STATUS page.

From [1R] to [5R]	Disconnects the corresponding ADS-C connected center.

ATC LAT REQ

Ident.: DSC-46-10-40-30-00021081.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



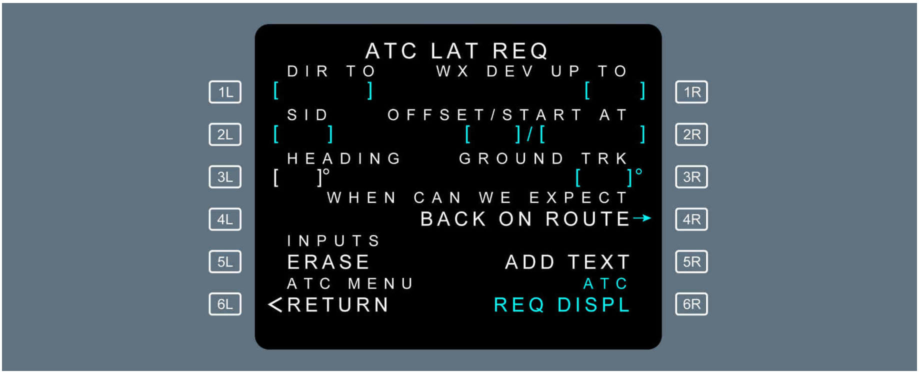
```
          ATC LAT REQ
 DIR TO         WX DEV UP TO
[       ]               [    ]
 SID         OFFSET/START AT
[    ]          [    ]/[      ]
 HEADING         GROUND TRK
[    ]°                [    ]°
     WHEN CAN WE EXPECT
              BACK ON ROUTE→
 ALL FIELDS
 ERASE               ADD TEXT
 ATC MENU                 ATC
<RETURN             REQ DISPL
```

[1L] DIR TO	Enters a selected waypoint, in order to proceed to, from the present position.
[2L] SID or STAR	Enters a request of departure or arrival procedure, depending on the current flight phase. The departure procedure can only be proposed, before takeoff. The arrival procedure can only be proposed, after takeoff.
[3L] HEADING	Enters a heading, in order to prepare a heading change request.
[5L] ALL FIELDS ERASE	Erases data that were entered on: - ATC LAT REQ page - Other associated pages.
[6L] ATC MENU RETURN	When selected, the DCDU displays the ATC MENU page.
[1R] WX DEV UP TO	Enters a request of offset from the initial route, due to weather conditions.
[2R] OFFSET/START AT	Enters an offset from the initial route. START AT field is optional. The flight crew can enter a position or time into the START AT field .
[3R] GROUND TRK	Enters a ground track of track change request.

[4R] WHEN CAN WE EXPECT BACK ON ROUTE	Prepares a negotiation request, in order to return to the initial route. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([4R]).
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

ATC LAT REQ

Ident.: DSC-46-10-40-30-00021081.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

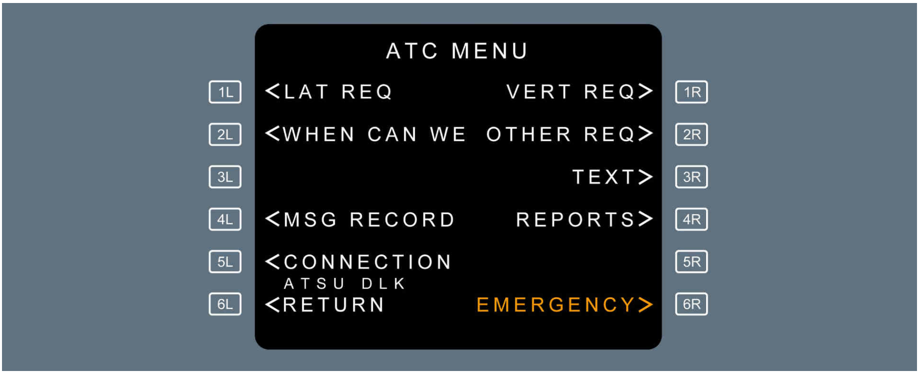

ATC LAT REQ
DIR TO
WX DEV UP TO
[ ]
[ ]
SID
OFFSET/START AT
[ ]
[ ]/[ ]
HEADING
GROUND TRK
[ ]°
[ ]°
WHEN CAN WE EXPECT
BACK ON ROUTE→
INPUTS
ERASE
ADD TEXT
ATC MENU
ATC
<RETURN
REQ DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] DIR TO	Enters a selected waypoint, in order to proceed to, from the present position.
[2L] SID or STAR	Enters a request of departure or arrival procedure, depending on the current flight phase. The departure procedure can only be proposed, before takeoff. The arrival procedure can only be proposed, after takeoff.
[3L] HEADING	Enters a heading, in order to prepare a heading change request.
[5L] INPUTS ERASE	Erases data that were entered on: - ATC LAT REQ page - Other associated pages.
[6L] ATC MENU RETURN	When selected, the DCDU displays the ATC MENU page.
[1R] WX DEV UP TO	Enters a request of offset from the initial route, due to weather conditions.

[2R] OFFSET/START AT	Enters an offset from the initial route. START AT field is optional. The flight crew can enter a position or time into the START AT field .
[3R] GROUND TRK	Enters a ground track of track change request.
[4R] WHEN CAN WE EXPECT BACK ON ROUTE	Prepares a negotiation request, in order to return to the initial route. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([4R]).
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

ATC MENU

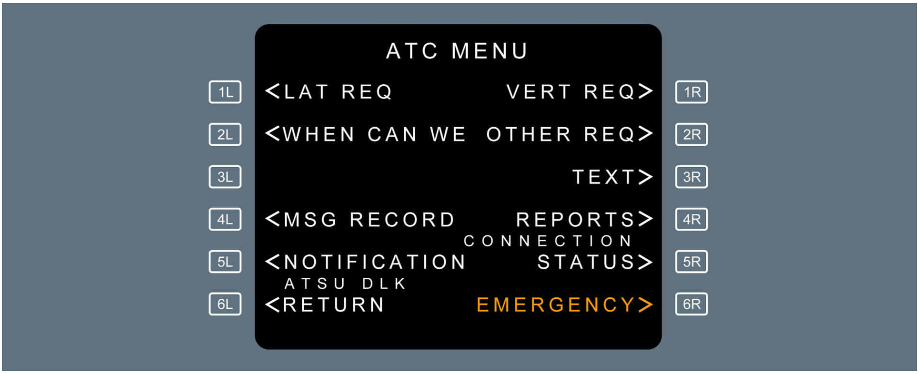
Ident.: DSC-46-10-40-30-20-00021071.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



[1L] LAT REQ	When selected, the MCDU displays the ATC LAT REQ page.
[2L] WHEN CAN WE	When selected, the MCDU displays the WHEN CAN WE EXPECT page.
[4L] MSG RECORD	When selected, the MCDU displays the MSG RECORD page.
[5L] CONNECTION	When selected, the MCDU displays the CONNECTION page.
[6L] ATSU DLK RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[1R] VERT REQ	When selected, the MCDU displays the ATC VERT REQ page.
[2R] OTHER REQ	When selected, the MCDU displays the ATC OTHER REQ page.
[3R] TEXT	When selected, the MCDU displays the TEXT page.

[4R] REPORTS	When selected, the MCDU displays the ATC REPORTS page.
[6R] EMERGENCY	When selected, the MCDU displays the EMERGENCY page.

Ident.: DSC-46-10-40-30-20-00021071.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

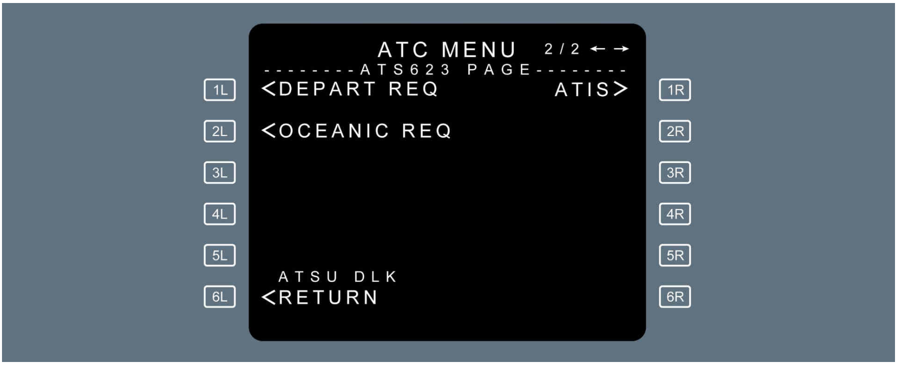

ATC MENU
1L
<LAT REQ
VERT REQ>
1R
2L
<WHEN CAN WE
OTHER REQ>
2R
3L
TEXT>
3R
4L
<MSG RECORD
REPORTS>
4R
CONNECTION
5L
<NOTIFICATION
STATUS>
5R
ATSU DLK
6L
<RETURN
EMERGENCY>
6R

[1L] LAT REQ	When selected, the MCDU displays the ATC LAT REQ page.
[2L] WHEN CAN WE	When selected, the MCDU displays the WHEN CAN WE EXPECT page.
[4L] MSG RECORD	When selected, the MCDU displays the MSG RECORD page.
[5L] NOTIFICATION	When selected, the MCDU displays the NOTIFICATION page.
[6L] ATSU DLK RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[1R] VERT REQ	When selected, the MCDU displays the ATC VERT REQ page.
[2R] OTHER REQ	When selected, the MCDU displays the ATC OTHER REQ page.
[3R] TEXT	When selected, the MCDU displays the TEXT page.
[4R] REPORTS	When selected, the MCDU displays the ATC REPORTS page.
[5R] CONNECTION STATUS	When selected, the MCDU displays the CONNECTION STATUS page.
[6R] EMERGENCY	When selected, the MCDU displays the EMERGENCY page.

Ident.: DSC-46-10-40-30-20-00021100.0001001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ATC MENU PAGE 2/2

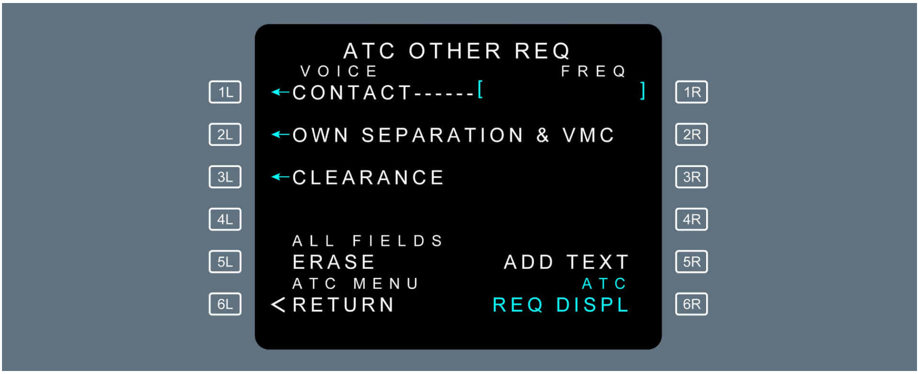

ATC MENU 2/2 ← →
--------ATS623 PAGE--------
<DEPART REQ
ATIS>
<OCEANIC REQ
ATSU DLK
<RETURN
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] DEPART REQ	When selected, the MCDU displays the DEPART REQ page.
[2L] OCEANIC REQ	When selected, the MCDU displays the OCEANIC REQ page.
[6L] ATSU DLK RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[1R] ATIS	When selected, the MCDU displays the ATIS page.

ATC OTHER REQ

Ident.: DSC-46-10-40-30-00021083.0002001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

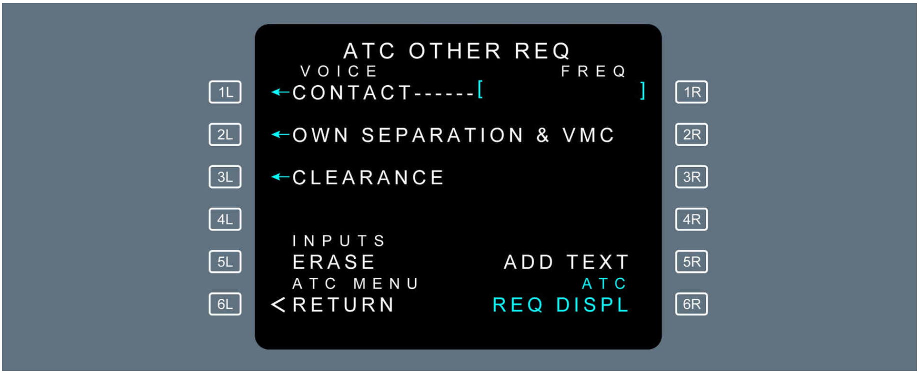

ATC OTHER REQ
VOICE
FREQ
←CONTACT------[ ]
←OWN SEPARATION & VMC
←CLEARANCE
ALL FIELDS
ERASE
ADD TEXT
ATC MENU
<RETURN
ATC
REQ DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] VOICE CONTACT Requests voice contact with the ATC center.

[2L] OWN SEPARATION & VMC	Prepares: - Request of Visual Meteorological Conditions (VMC) procedure - Request, in order to be to maintain own separations, at the captain's initiative.
[3L] CLEARANCE	Prepares a clearance request.
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] FREQ	Enters the voice frequency that is necessary for voice contact with the ATC.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the MCDU displays prepared message.

ATC OTHER REQ

Ident.: DSC-46-10-40-30-00021083.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

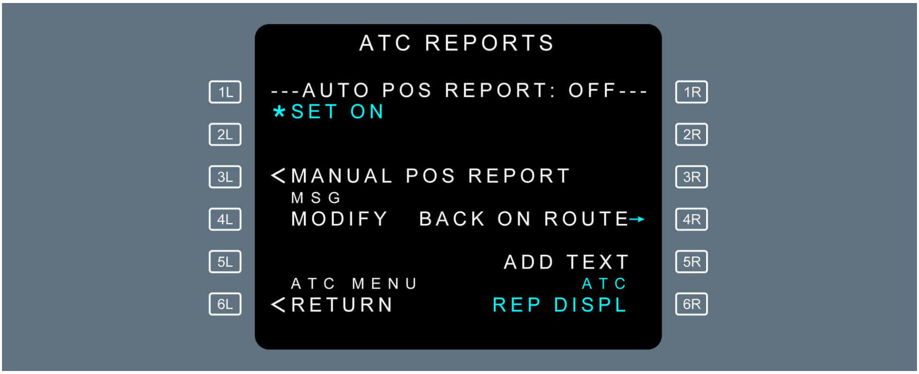

ATC OTHER REQ
VOICE
FREQ
←CONTACT------[ ]
←OWN SEPARATION & VMC
←CLEARANCE
INPUTS
ERASE
ADD TEXT
ATC MENU
<RETURN
ATC
REQ DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] VOICE CONTACT	Requests voice contact with the ATC center.
[2L] OWN SEPARATION & VMC	Prepares: - Request of Visual Meteorological Conditions (VMC) procedure - Request, in order to be to maintain own separations, at the captain's initiative.
[3L] CLEARANCE	Prepares a clearance request.

[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] FREQ	Enters the voice frequency that is necessary for voice contact with the ATC.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the MCDU displays prepared message.

ATC REPORTS

Ident.: DSC-46-10-40-30-00021093.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

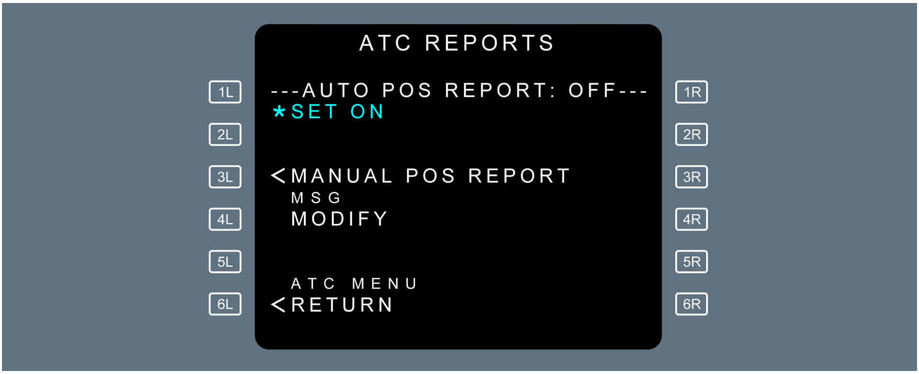

ATC REPORTS
---AUTO POS REPORT: OFF---
*SET ON
<MANUAL POS REPORT
MSG
MODIFY BACK ON ROUTE→
ADD TEXT
ATC MENU ATC
<RETURN REP DISPL

Line 1	Displays the status of the AUTO POS REPORT function.
[2L] SET OFF or SET ON	Activates (or deactivates) the automation position report function.
[3L] MANUAL POS REPORT	When selected, the MCDU displays the POSITION REPORT page.
[4L] MSG MODIFY	When selected, the MCDU displays the MSG MODIFY page.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[4R] BACK ON ROUTE	Prepares the BACK ON ROUTE message.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.

[6R] ATC REP DISPL	When selected, the DCDU displays prepared BACK ON ROUTE message.

ATC REPORTS

Ident.: DSC-46-10-40-30-00021093.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP



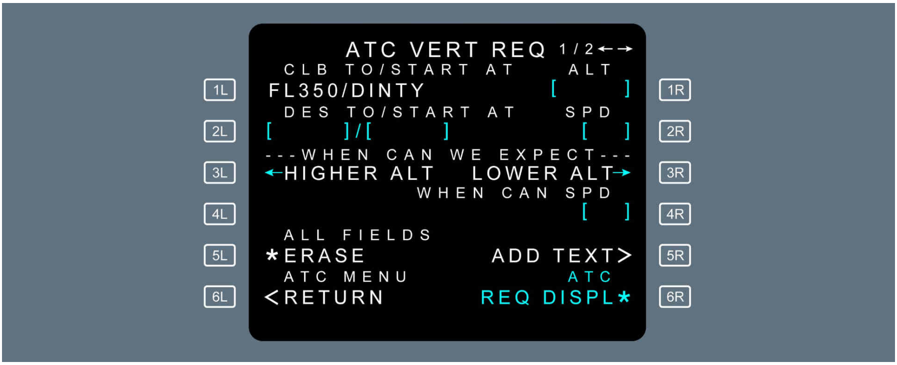
```
ATC REPORTS
---AUTO POS REPORT: OFF---
*SET ON

<MANUAL POS REPORT
 MSG
 MODIFY

 ATC MENU
<RETURN
```

Line 1	Displays the status of the AUTO POS REPORT function.
[2L] SET OFF or SET ON	Activates (or deactivates) the automation position report function.
[3L] MANUAL POS REPORT	When selected, the MCDU displays the POSITION REPORT page.
[4L] MSG MODIFY	When selected, the MCDU displays the MSG MODIFY page.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.

ATC VERT REQ

Ident.: DSC-46-10-40-30-00021082.0002001 / 12 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ATC VERT REQ PAGE 1/2

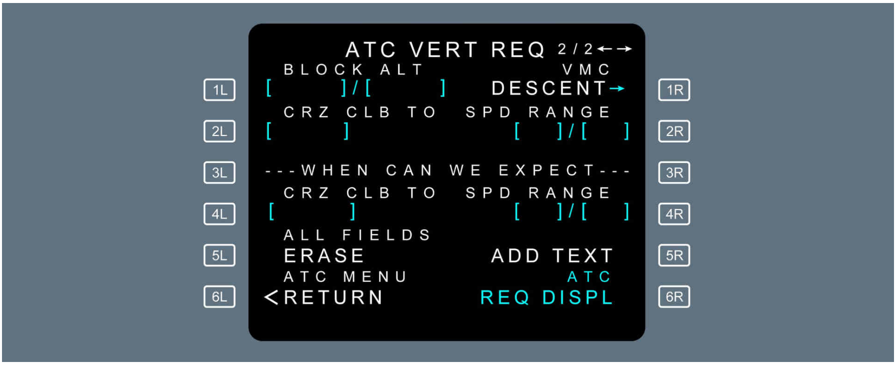


```
        ATC VERT REQ 1/2←→
  CLB TO/START AT     ALT
FL350/DINTY        [      ]
  DES TO/START AT     SPD
[      ]/[      ]   [    ]
---WHEN CAN WE EXPECT---
←HIGHER ALT   LOWER ALT→
         WHEN CAN SPD
                    [    ]
  ALL FIELDS
*ERASE          ADD TEXT>
  ATC MENU            ATC
<RETURN         REQ DISPL*
```

[1L] CLB TO/START AT	Prepares a request, in order to climb to a new altitude. START AT field is optional, and can be filled in with: - Position - Time. If the request is deferred, START AT field should be filled in with the starting-climb waypoint.
[2L] DES TO/START AT	Prepares a request, in order to descend to a new altitude. If the request is deferred, START AT field should be filled in with the starting-descent waypoint.
[3L] WHEN CAN WE EXPECT HIGHER ALT	Prepares a negotiation request, in order to climb to a higher altitude. If a lower altitude was selected, setting a higher altitude deselects the lower altitude. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([1L]).
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] ALT	Prepares a request of new altitude.
[2R] SPD	Prepares a request of new speed.

[3R] WHEN CAN WE EXPECT LOWER ALT	Prepares a negotiation request, in order to descend to a lower altitude. If a higher altitude was selected, setting a lower altitude deselects the higher altitude. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([1R]).
[4R] WHEN CAN SPD	Prepares a negotiation request of new speed-deferred clearance. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([3R]).
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

ATC VERT REQ PAGE 2/2


ATC VERT REQ 2/2 ←→
BLOCK ALT
[ ]/[ ]
VMC
DESCENT→
CRZ CLB TO
[ ]
SPD RANGE
[ ]/[ ]
---WHEN CAN WE EXPECT---
CRZ CLB TO
[ ]
SPD RANGE
[ ]/[ ]
ALL FIELDS
ERASE
ADD TEXT
ATC MENU
<RETURN
ATC
REQ DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

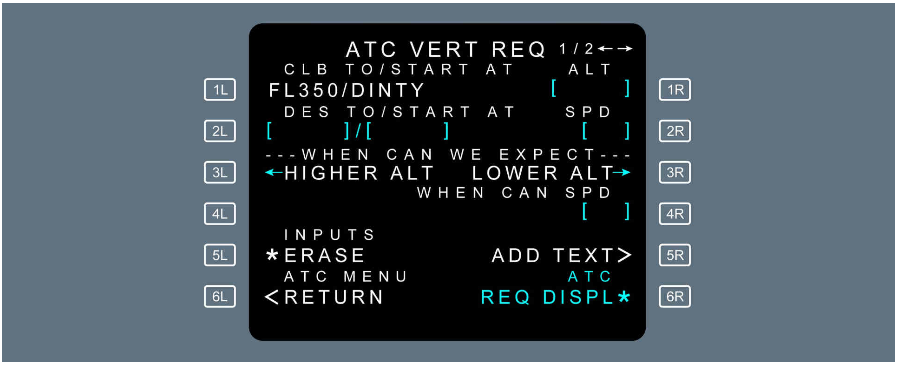
[1L] BLOCK ALT	Prepares a request, in order to operate within an altitude interval (e.g.: FL 370/FL 410).
[2L] CRZ CLB TO	Prepares a request of cruise climb segment, up to the entered cruise altitude.
[4L] WHEN CAN WE EXCEPT CRZ CLB TO	Prepares a negotiation request of cruise climb segment, up to the entered cruise altitude. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([2L]).
[5L] ALL FIELDS ERASE	Erase all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.

[1R] VMC DESCENT	Prepares a request of Visual Meteorological Condition (VMC) descent.
[2R] SPD RANGE	Prepares a request, in order to operate within a speed range.
[4R] WHEN CAN WE EXPECT SPD RANGE	Prepares a negotiation request, in order to operate within a speed range. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([3R]).
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

ATC VERT REQ

Ident.: DSC-46-10-40-30-00021082.0001001 / 12 MAY 23
Applicable to: LV-GKO, LV-GKP

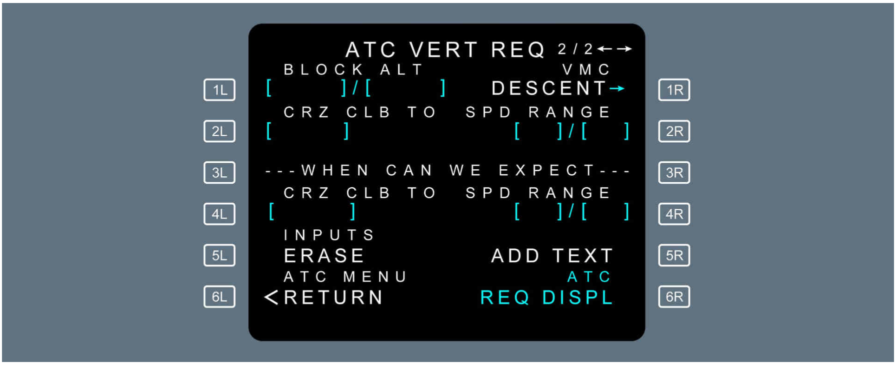
ATC VERT REQ PAGE 1/2


ATC VERT REQ 1/2←→
CLB TO/START AT
ALT
FL350/DINTY
[ ]
DES TO/START AT
SPD
[ ]/[ ]
[ ]
---WHEN CAN WE EXPECT---
←HIGHER ALT
LOWER ALT→
WHEN CAN SPD
[ ]
INPUTS
*ERASE
ADD TEXT>
ATC MENU
<RETURN
ATC
REQ DISPL*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] CLB TO/START AT	Prepares a request, in order to climb to a new altitude. START AT field is optional, and can be filled in with: - Position - Time. If the request is deferred, START AT field should be filled in with the starting-climb waypoint.
[2L] DES TO/START AT	Prepares a request, in order to descend to a new altitude. If the request is deferred, START AT field should be filled in with the starting-descent waypoint.

[3L] WHEN CAN WE EXPECT HIGHER ALT	Prepares a negotiation request, in order to climb to a higher altitude. If a lower altitude was selected, setting a higher altitude deselects the lower altitude. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([1L]).
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] ALT	Prepares a request of new altitude.
[2R] SPD	Prepares a request of new speed.
[3R] WHEN CAN WE EXPECT LOWER ALT	Prepares a negotiation request, in order to descend to a lower altitude. If a higher altitude was selected, setting a lower altitude deselects the higher altitude. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([1R]).
[4R] WHEN CAN SPD	Prepares a negotiation request of new speed-deferred clearance. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([3R]).
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

ATC VERT REQ PAGE 2/2



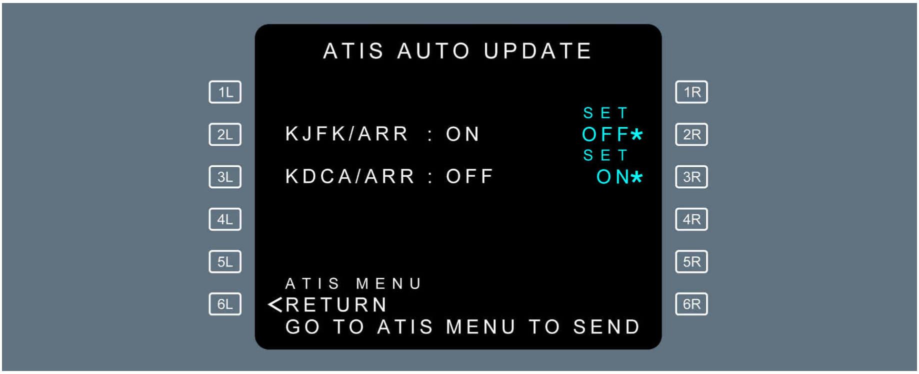
```
          ATC VERT REQ 2/2←→
  BLOCK ALT              VMC
[       ]/[     ]    DESCENT→
  CRZ CLB TO     SPD RANGE
[       ]            [   ]/[   ]

---WHEN CAN WE EXPECT---
  CRZ CLB TO     SPD RANGE
[       ]            [   ]/[   ]
  INPUTS
  ERASE             ADD TEXT
  ATC MENU               ATC
<RETURN             REQ DISPL
```

[1L] BLOCK ALT	Prepares a request, in order to operate within an altitude interval (e.g.: FL 370/FL 410).

[2L] CRZ CLB TO	Prepares a request of cruise climb segment, up to the entered cruise altitude.
[4L] WHEN CAN WE EXCEPT CRZ CLB TO	Prepares a negotiation request of cruise climb segment, up to the entered cruise altitude. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([2L]).
[5L] INPUTS ERASE	Erase all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] VMC DESCENT	Prepares a request of Visual Meteorological Condition (VMC) descent.
[2R] SPD RANGE	Prepares a request, in order to operate within a speed range.
[4R] WHEN CAN WE EXPECT SPD RANGE	Prepares a negotiation request, in order to operate within a speed range. The same negotiation request can be prepared on the WHEN CAN WE EXPECT page ([3R]).
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

ATIS AUTO-UPDATE

Ident.: DSC-46-10-40-30-00021102.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



ATIS AUTO UPDATE

KJFK/ARR : ON — SET OFF*

KDCA/ARR : OFF — SET ON*

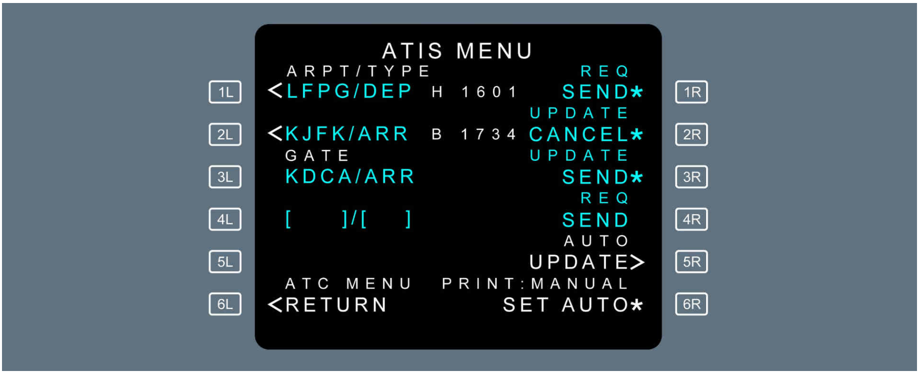
ATIS MENU
<RETURN
GO TO ATIS MENU TO SEND

From [1L] to [4L]	Display the arrival airports (from the FMS flight plan), and the associated type of ATIS request by default. The auto update function may be armed, or activated (ON), or disarmed (OFF). The auto update function is OFF by default.
[6L] ATIS MENU RETURN	When selected, the DCDU displays the ATIS MENU page.
From [1R] to [4R]	SET ON : Arms the automatic update of new ATIS reports function. When the automatic update function is armed, the crew has to send a request for automatic update to the ground via the ATIS MENU page. SET OFF : Disarms the automatic update of new ATIS reports function.

ATIS MENU

Ident.: DSC-46-10-40-30-00021101.0002001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


ATIS MENU
ARPT/TYPE
REQ
<LFPG/DEP H 1601
SEND*
UPDATE
<KJFK/ARR B 1734
CANCEL*
GATE
UPDATE
KDCA/ARR
SEND*
REQ
[ ]/[ ]
SEND
AUTO
UPDATE>
ATC MENU
PRINT:MANUAL
<RETURN
SET AUTO*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

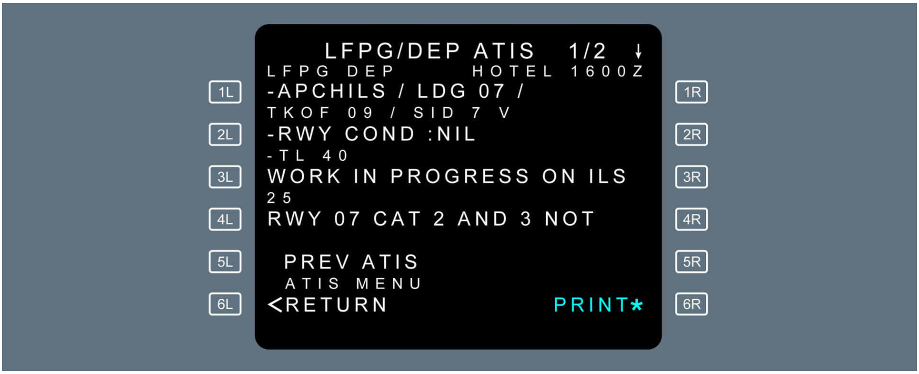
From [1L] to [3L]	Display the airports (from the FMS flight plan), and the associated type of ATIS requests by default. These fields may be modified. When an ATIS report is received, the ATIS code and time (when the ATIS report was created) are displayed next to the applicable ARPT/TYPE. This ATIS may be read by pressing its associated left key.
Line 4	Enables to insert an additional airport, and the associated ATIS request type.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.

From [1R] to [4R]	Displays options: - REQ SEND: REQ SEND is the function displayed by default. When selected, the flight crew sends manually an ATIS report request to the ground. - UPDATE SEND: When selected, the flight crew sends a request for automatic reception of new ATIS reports to the ground. The automatic update of new ATIS reports function is armed via the ATIS AUTO UPDATE page. - UPDATE CANCEL: When selected, the flight crew cancels the automatic reception of new ATIS reports.
[5R] AUTO UPDATE	When selected, the MCDU displays the AUTO UPDATE page. *Note:* *The flight crew sets the automatic update of new ATIS reports on the AUTO UPDATE page.*
[6R] PRINT : MANUAL SET AUTO	Sets the PRINT function to AUTO, to have all reports automatically printed upon reception. The PRINT function is set to MANUAL by default.

ATIS REPORT

Ident.: DSC-46-10-40-30-00021103.0001001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



```
      LFPG/DEP ATIS   1/2  ↓
LFPG DEP         HOTEL  1600Z
-APCHILS / LDG 07 /
TKOF 09 / SID 7 V
-RWY COND :NIL
-TL 40
WORK IN PROGRESS ON ILS
25
RWY 07 CAT 2 AND 3 NOT

  PREV ATIS
  ATIS MENU
<RETURN               PRINT*
```

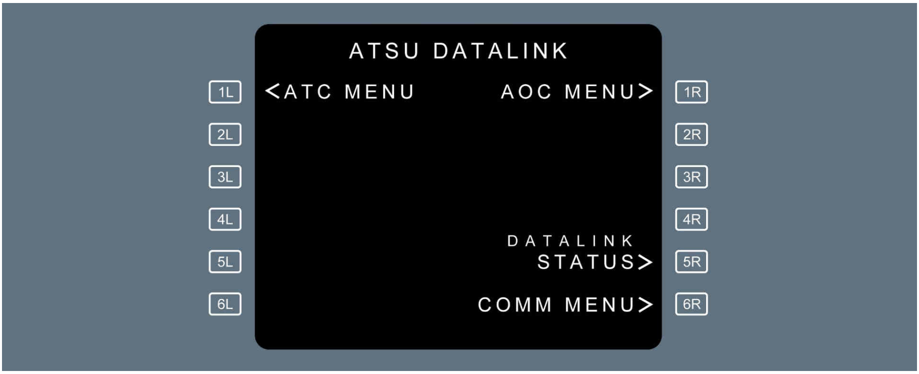
Line 1 - line 4	Displays the ATIS report text.
[5L] PREV ATIS	Displays the previous ATIS report for this airport.

[6L] ATIS MENU RETURN	When selected, the DCDU displays the ATIS MENU page.
[6R] PRINT	When selected, the printer prints the report that is currently displayed on the ATIS REPORT page.

ATSU DATALINK

Ident.: DSC-46-10-40-30-00021074.0003001 / 21 MAR 17

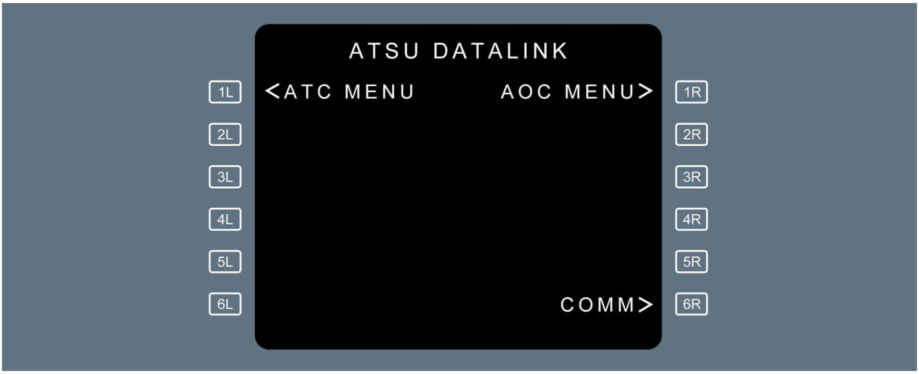
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


ATSU DATALINK
<ATC MENU
AOC MENU>
DATALINK
STATUS>
COMM MENU>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] ATC MENU	When selected, the MCDU displays the ATC MENU page.
[1R] AOC MENU	When selected, the MCDU displays the AOC MENU page.
[5R] DATALINK STATUS	When selected, the MCDU displays the DATALINK STATUS page.
[6R] COMM MENU	When selected, the MCDU displays the COMM MENU page.

ATSU DATALINK

Ident.: DSC-46-10-40-30-00021074.0002001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

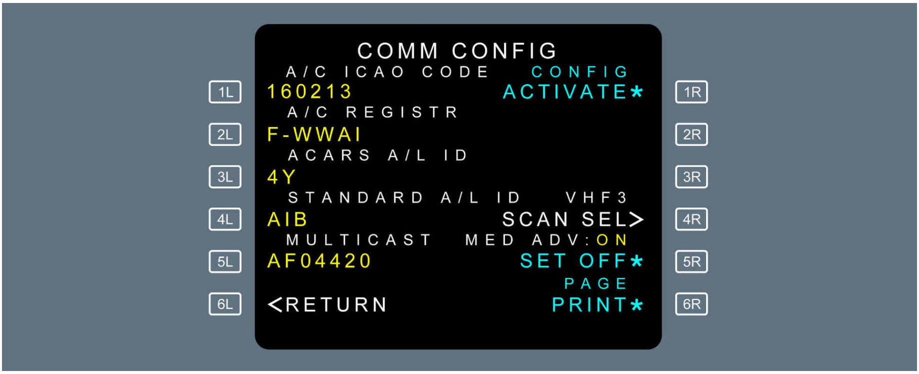


[1L] ATC MENU	When selected, the MCDU displays the ATC MENU page.
[1R] AOC MENU	When selected, the MCDU displays the AOC MENU page.
[6R] COMM	When selected, the MCDU displays the COMM MENU page.

COMM CONFIG

Ident.: DSC-46-10-40-30-00021078.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

EXAMPLE	This is an example of the COMM CONFIG page. Information, that are displayed on the COMM CONFIG page, depend on datalink customization, selected by each operator. E.g.: If a router configuration file, integrated in the ATSU, contains a customized VHF scan mask, the access to the VHF 3 SCAN SELECT page will not display. The VHF 3 SCAN SELECT page will not accessible.



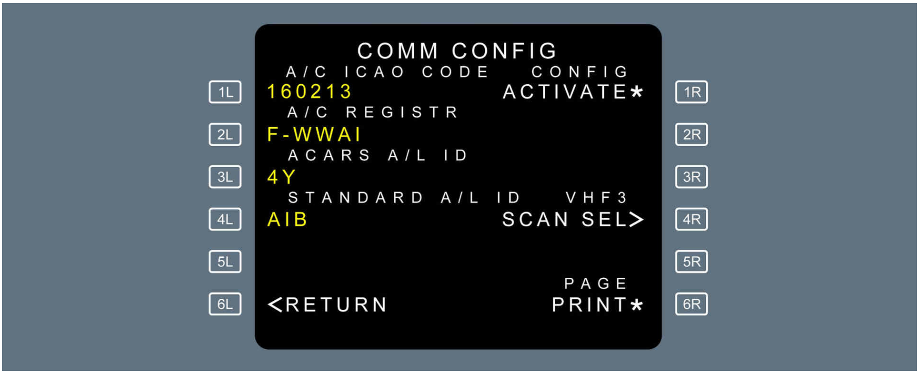
```
        COMM CONFIG
 A/C ICAO CODE        CONFIG
160213             ACTIVATE*
 A/C REGISTR
F-WWAI
 ACARS A/L ID
4Y
 STANDARD A/L ID        VHF3
AIB                SCAN SEL>
 MULTICAST     MED ADV:ON
AF04420             SET OFF*
                       PAGE
<RETURN               PRINT*
```

EXAMPLE	[1L] A/C ICAO CODE	Displays the aircraft ICAO code. Note: *If the FMGEC does not enter the paramater automatically, the flight crew can enter the A/C ICAO CODE manually.*
	[2L] A/C REGISTR	Displays the aircraft registration. Note: *If the FMGEC does not enter the paramater automatically, the flight crew can enter the A/C REGISTR manually.*
	[3L] ACARS A/L ID	Displays the ACARS airline identification. Note: *If the FMGEC does not enter the paramater automatically, the flight crew can enter the ACARS A/L ID manually.*
	[4L] STANDARD A/L ID	Displays the standard airline identification. Note: *If the FMGEC does not enter the paramater automatically, the flight crew can enter the STANDARD A/L ID manually.*
	[5L] MULTICAST	Displays the optional multicast ACARS address.
	[6L] RETURN	When selected, the MCDU displays the COMM MENU page.
	[1R] CONFIG ACTIVATE	When selected, the system activates parameters that were entered manually.
	[5R] VHF3 SCAN SEL	When selected, the DCDU displays the VHF3 SCAN SELECT page.
	[5R] MED ADV	Sets the transition status of labels on/off.
	[6R] PAGE PRINT	When selected, the printer prints information.

COMM CONFIG

Ident.: DSC-46-10-40-30-00021078.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

EXAMPLE	This is an example of the COMM CONFIG page. Information, that are displayed on the COMM CONFIG page, depend on datalink customization, selected by each operator. E.g.: If a router configuration file, integrated in the ATSU, contains a customized VHF scan mask, the access to the VHF 3 SCAN SELECT page will not display. The VHF 3 SCAN SELECT page will not accessible.

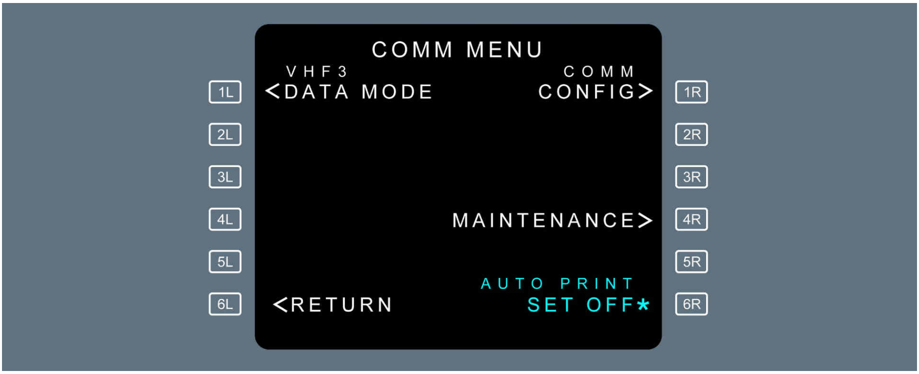


COMM CONFIG
A/C ICAO CODE 160213
CONFIG ACTIVATE*
A/C REGISTR F-WWAI
ACARS A/L ID 4Y
STANDARD A/L ID AIB
VHF3 SCAN SEL>
<RETURN
PAGE PRINT*

EXAMPLE	[1L] A/C ICAO CODE	Displays the aircraft ICAO code. *Note: If the FMGEC does not enter the paramater automatically, the flight crew can enter the A/C ICAO CODE manually.*
	[2L] A/C REGISTR	Displays the aircraft registration. *Note: If the FMGEC does not enter the paramater automatically, the flight crew can enter the A/C REGISTR manually.*
	[3L] ACARS A/L ID	Displays the ACARS airline identification. *Note: If the FMGEC does not enter the paramater automatically, the flight crew can enter the ACARS A/L ID manually.*
	[4L] STANDARD A/L ID	Displays the standard airline identification. *Note: If the FMGEC does not enter the paramater automatically, the flight crew can enter the STANDARD A/L ID manually.*
	[6L] RETURN	When selected, the MCDU displays the COMM MENU page.
	[1R] CONFIG ACTIVATE	When selected, the system activates parameters that were entered manually.
	[4R] VHF3 SCAN SEL	When selected, the DCDU displays the VHF3 SCAN SELECT page.
	[6R] PAGE PRINT	When selected, the printer prints information.

COMM MENU

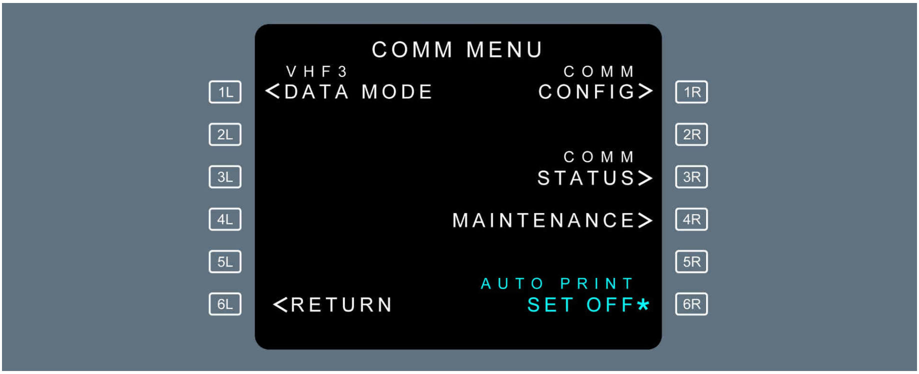
Ident.: DSC-46-10-40-30-00021080.0003001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


COMM MENU
VHF3
<DATA MODE
COMM
CONFIG>
MAINTENANCE>
AUTO PRINT
<RETURN
SET OFF*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] VHF3 DATA MODE	When selected, the MCDU displays the VHF3 DATA MODE page.
[6L] RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[1R] COMM CONFIG	When selected, the MCDU displays the COMM CONFIG page.
[4R] MAINTENANCE	When selected, the MCDU displays the MAINTENANCE page.
[6R] AUTO PRINT	Sets the auto-print on or off.

COMM MENU

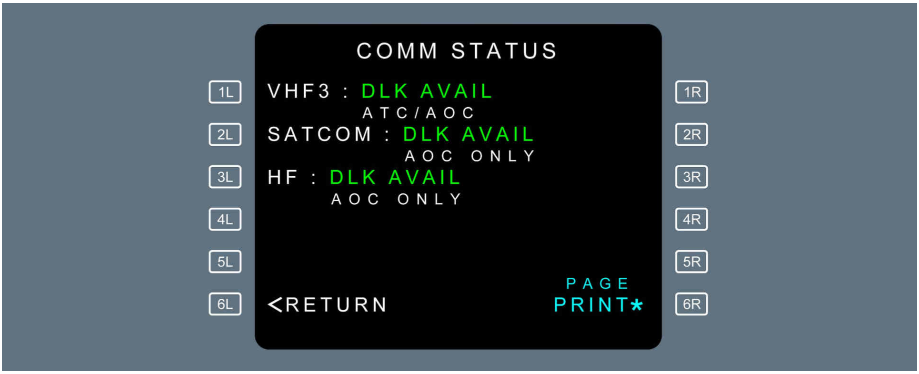
Ident.: DSC-46-10-40-30-00021080.0002001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP


COMM MENU
VHF3
<DATA MODE
COMM
CONFIG>
COMM
STATUS>
MAINTENANCE>
AUTO PRINT
<RETURN
SET OFF*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] VHF3 DATA MODE	When selected, the MCDU displays the VHF3 DATA MODE page.
[6L] RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[1R] COMM CONFIG	When selected, the MCDU displays the COMM CONFIG page.
[3R] COMM STATUS	When selected, the MCDU displays the COMM STATUS page.
[4R] MAINTENANCE	When selected, the MCDU displays the MAINTENANCE page.
[6R] AUTO PRINT	Sets the auto-print on or off.

COMM STATUS

Ident.: DSC-46-10-40-30-00021149.0001001 / 05 MAR 19
Applicable to: LV-GKO, LV-GKP



COMM STATUS
VHF3 : DLK AVAIL
ATC/AOC
SATCOM : DLK AVAIL
AOC ONLY
HF : DLK AVAIL
AOC ONLY
PAGE
<RETURN PRINT*

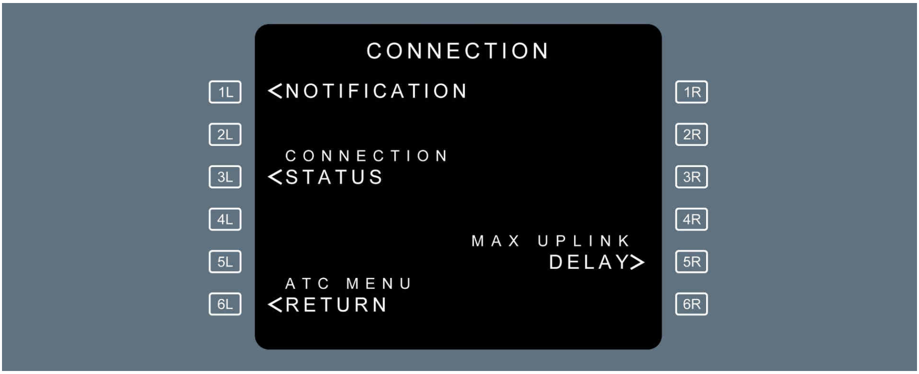
VHF 3 Line 1	Displays datalink status: - DLK AVAIL The datalink communication is established and available. - DLK NOT AVAIL The datalink communication is not established. - INOP The VHF 3 datalink is not operative. - NO NETWORK The VHF 3 datalink is inhibited. - VOICE The VHF 3 datalink operates in the voice mode.

VHF 3 Line 2	Displays availability of datalink applications: - ATC / AOC Datalink communication via ATC and AOC applications is available. - ATC ONLY Datalink communication via ATC applications is available. - AOC ONLY Datalink communication via AOC applications is available.
SATCOM Line 1	Displays datalink status: - DLK AVAIL The datalink communication is established and available. - DLK NOT AVAIL The datalink communication is not established. - INOP The SATCOM datalink is not operative. - NOT INSTALLED The SATCOM datalink is not installed.
SATCOM Line 2	Displays availability of datalink applications: - ATC / AOC Datalink communication via ATC and AOC applications is available. - ATC ONLY Datalink communication via ATC applications is available. - AOC ONLY Datalink communication via AOC applications is available.
HF Line 1	Displays datalink status: - DLK AVAIL The datalink communication is established and available. - DLK NOT AVAIL The datalink communication is not established. - INOP The HF datalink is not operative. - VOICE The HF datalink operates in the voice mode. - NOT INSTALLED The HF datalink is not installed.

HF Line 2	Displays availability of datalink applications: - ATC / AOC Datalink communication via ATC and AOC applications is available. - ATC ONLY Datalink communication via ATC applications is available. - AOC ONLY Datalink communication via AOC applications is available.
[6L] RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[6R] PAGE PRINT	When selected, the printer prints the information.

CONNECTION

Ident.: DSC-46-10-40-30-00021086.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

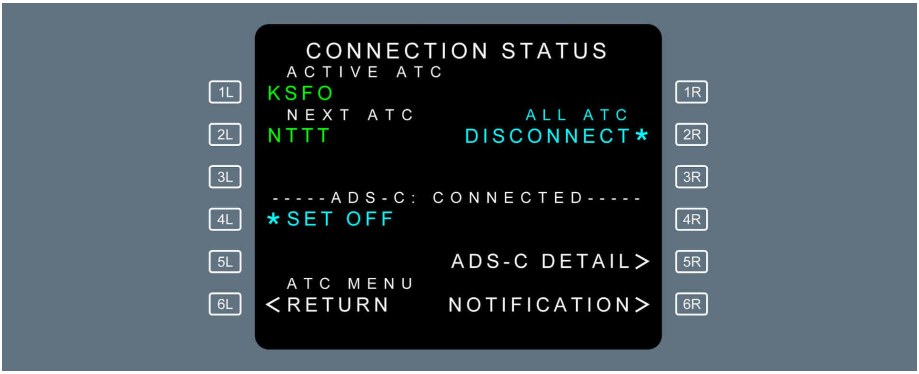

CONNECTION
<NOTIFICATION
CONNECTION
<STATUS
MAX UPLINK
DELAY>
ATC MENU
<RETURN

[1L] NOTIFICATION	When selected, the MCDU displays the NOTIFICATION page.
[3L] CONNECTION STATUS	When selected, the MCDU displays the CONNECTION STATUS page.
[5R] MAX UPLINK DELAY	When selected, the MCDU displays the MAX UPLINK DELAY page.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.

CONNECTION STATUS

Ident.: DSC-46-10-40-30-00021088.0003001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

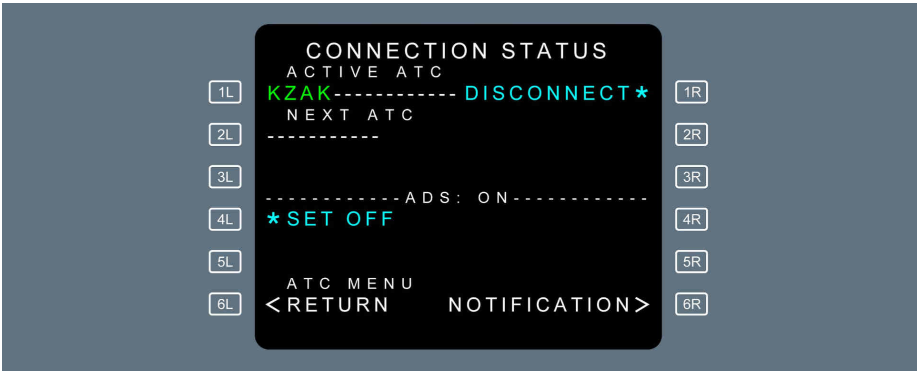


```
          CONNECTION STATUS
  ACTIVE ATC
KSFO
  NEXT ATC                 ALL ATC
NTTT                    DISCONNECT*

-----ADS-C: CONNECTED-----
*SET OFF
                       ADS-C DETAIL>
  ATC MENU
<RETURN                NOTIFICATION>
```

[1L] ACTIVE ATC	Displays the currently active ATC for CPDLC connection.
[2L] NEXT ATC	Displays the next ATC for CPDLC connection.
Line 4	Displays the status of the ADS-C function (ARMED, CONNECTED, or OFF). The default setting of ADS-C is ARMED.
[4L] SET OFF or SET ARMED	Activates / deactivates the ADS-C function when the Automatic Dependent Surveillance-Contract (ADS-C) is OFF or ARMED.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] ALL ATC DISCONNECT	Disconnects all established CPDLC connections.
[5R] ADS DETAIL	When selected, the MCDU displays the ADS-C DETAIL page. *Note:* *The ADS-C DETAIL page can only be accessed, if ADS-C connections are established.*
[6R] NOTIFICATION	When selected, the MCDU displays the NOTIFICATION page.

CONNECTION STATUS

Ident.: DSC-46-10-40-30-00021088.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

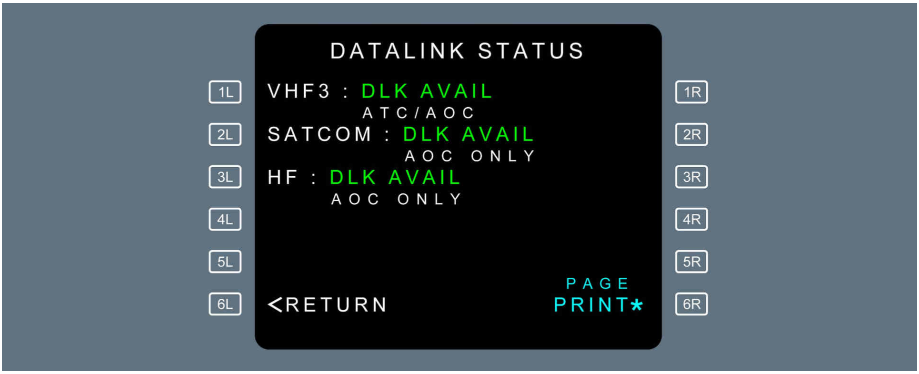


```
     CONNECTION STATUS
  ACTIVE ATC
KZAK------------ DISCONNECT*
  NEXT ATC
-----------

------------ADS: ON------------
*SET OFF


  ATC MENU
<RETURN        NOTIFICATION>
```

[1L] ACTIVE ATC	Displays the currently active ATC for CPDLC connection.
[2L] NEXT ATC	Displays the next ATC for CPDLC connection.
Line 4	Displays the status of the ADS-C function (ARMED, CONNECTED, or OFF). The default setting of ADS-C is ARMED.
[4L] SET OFF or SET ON	Activates / deactivates the ADS-C function when the Automatic Dependent Surveillance-Contract (ADS-C) is OFF or ON.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] DISCONNECT	Disconnects all established CPDLC connections.
[6R] NOTIFICATION	When selected, the MCDU displays the NOTIFICATION page.

DATALINK STATUS

Ident.: DSC-46-10-40-30-00021075.0002001 / 05 MAR 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

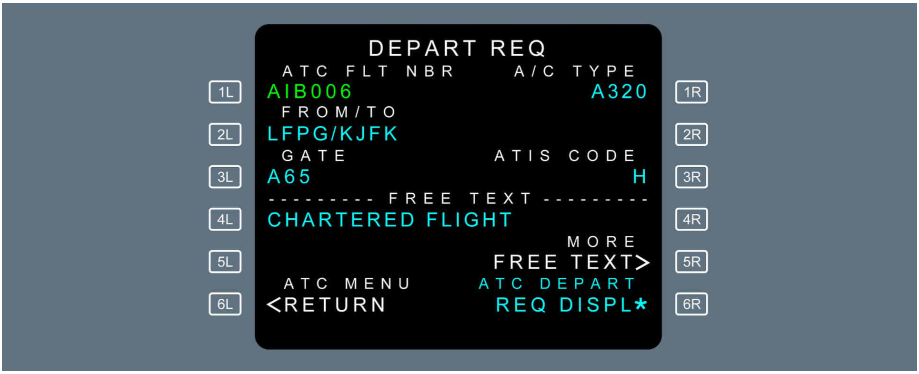

DATALINK STATUS
VHF3 : DLK AVAIL
ATC/AOC
SATCOM : DLK AVAIL
AOC ONLY
HF : DLK AVAIL
AOC ONLY
<RETURN
PAGE
PRINT*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

VHF 3 Line 1	Displays datalink status: - DLK AVAIL The datalink communication is established and available. - DLK NOT AVAIL The datalink communication is not established. - INOP The VHF 3 datalink is not operative. - NO NETWORK The VHF 3 datalink is inhibited. - VOICE The VHF 3 datalink operates in the voice mode.
VHF 3 Line 2	Displays availability of datalink applications: - ATC / AOC Datalink communication via ATC and AOC applications is available. - ATC ONLY Datalink communication via ATC applications is available. - AOC ONLY Datalink communication via AOC applications is available.

SATCOM Line 1	Displays datalink status: - DLK AVAIL The datalink communication is established and available. - DLK NOT AVAIL The datalink communication is not established. - INOP The SATCOM datalink is not operative. - NOT INSTALLED The SATCOM datalink is not installed.
SATCOM Line 2	Displays availability of datalink applications: - ATC / AOC Datalink communication via ATC and AOC applications is available. - ATC ONLY Datalink communication via ATC applications is available. - AOC ONLY Datalink communication via AOC applications is available.
HF Line 1	Displays datalink status: - DLK AVAIL The datalink communication is established and available. - DLK NOT AVAIL The datalink communication is not established. - INOP The HF datalink is not operative. - VOICE The HF datalink operates in the voice mode. - NOT INSTALLED The HF datalink is not installed.
HF Line 2	Displays availability of datalink applications: - ATC / AOC Datalink communication via ATC and AOC applications is available. - ATC ONLY Datalink communication via ATC applications is available. - AOC ONLY Datalink communication via AOC applications is available.
[6L] RETURN	When selected, the MCDU displays the ATSU DATALINK page.
[6R] PAGE PRINT	When selected, the printer prints the information.

DEPART REQ

Ident.: DSC-46-10-40-30-00021096.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



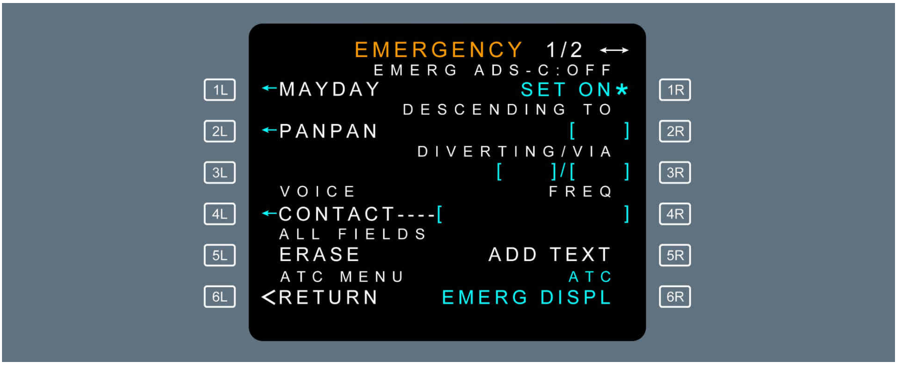
```
         DEPART REQ
 ATC FLT NBR          A/C TYPE
AIB006                    A320
 FROM/TO
LFPG/KJFK
 GATE               ATIS CODE
A65                          H
--------- FREE TEXT ---------
CHARTERED FLIGHT
                          MORE
                    FREE TEXT>
 ATC MENU          ATC DEPART
<RETURN            REQ DISPL*
```

[1L] ATC FLT NBR	The ATC flight number is automatically displayed by the system. The ATC flight number may be modified on the FMS INIT page.
[2L] FROM/TO	The departure and arrival airports are automatically displayed by the system, and may be modified by the flight crew. The departure request will be sent only to the departure airport.
[3L] GATE	Enters the departure gate number or the airport stand position.
[4L] FREE TEXT	Enters a free text.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] A/C TYPE	The aircraft type is automatically displayed by the system, and may be modified by the flight crew.
[3R] ATIS CODE	Enters the ATIS code. If the flight crew received an ATIS uplink message, the code of this message is displayed automatically .
[5R] MORE FREE TEXT	When selected, the MCDU displays the TEXT page, in order to add more free text in the message.
[6R] ATC DEPART REQ DISPLAY	When selected, the DCDU displays prepared departure request.

EMERGENCY

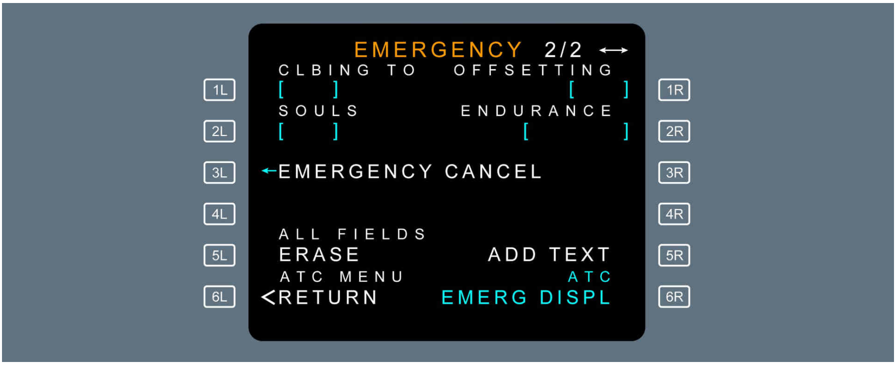
Ident.: DSC-46-10-40-30-00021092.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

EMERGENCY PAGE 1/2


EMERGENCY 1/2 ←→
EMERG ADS-C:OFF
←MAYDAY
SET ON*
DESCENDING TO
←PANPAN
[ ]
DIVERTING/VIA
[ ]/[ ]
VOICE
FREQ
←CONTACT----[ ]
ALL FIELDS
ERASE
ADD TEXT
ATC MENU
ATC
<RETURN
EMERG DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] MAYDAY	Generates a downlink message that indicates a critical failure on board.
[2L] PANPAN	Generates a downlink message that indicates a major failure on board.
[4L] VOICE CONTACT	Requests voice contact with the ATC. The default frequency is 121.5 MHz.
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases the data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] SET OFF or SET ON	Activates, or deactivates the ADS-C emergency mode. The title line displays the mode status: - EMERG ADS-C: ON, when the mode is activated - EMERG ADS-C:OFF, when the mode is not activated.
[2R] DESCENDING TO	Displays the FCU-selected altitude of the descent.
[3R] DIVERTING/VIA	Enters the route, or airport, the aircraft is diverting to.
[4R] FREQ	Enters the requested voice frequency of voice contact with the ATC.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT activates, while a message is being created.
[6R] ATC EMERG DISPL	When selected, the DCDU displays prepared emergency message.

EMERGENCY PAGE 2/2



```
        EMERGENCY 2/2 ←→
 CLBING TO     OFFSETTING
[    ]              [    ]
 SOULS          ENDURANCE
[    ]            [      ]
←EMERGENCY CANCEL


 ALL FIELDS
 ERASE            ADD TEXT
 ATC MENU              ATC
<RETURN        EMERG DISPL
```

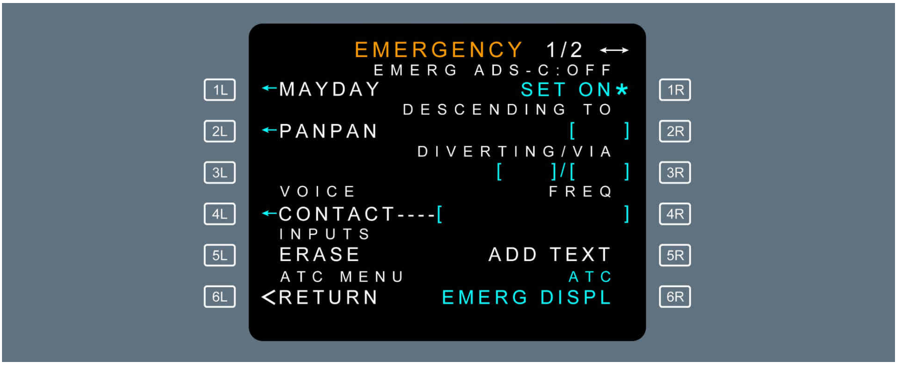
[1L] CLBING TO	Displays the FCU-selected altitude of the climb.
[2L] SOULS	Enters the number of passengers on board. Note: *SOULS and ENDURANCE fields are linked:* - *If one field is cleared, this automatically clears the other.* - *If one field is filled in, this automatically fills in the other.* - *If a field is empty, it is filled in with a default values (999 for SOULS and 0 h 00 for ENDURANCE).*
[3L] EMERGENCY CANCEL	Cancels the previous emergency message. Note: *If EMERGENCY CANCEL is selected, it deselects the PANPAN or MAYDAY items, and deactivates the ADS-C emergency mode.*
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] OFFSETTING	Enters the offset value from the flight plan.
[2R] ENDURANCE	Enters the maximum remaining flight time, limited by fuel autonomy.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT activates, while a message is being created.

[6R] ATC EMERG DISPL	When selected, the DCDU displays prepared emergency message.

EMERGENCY

Ident.: DSC-46-10-40-30-00021092.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

EMERGENCY PAGE 1/2

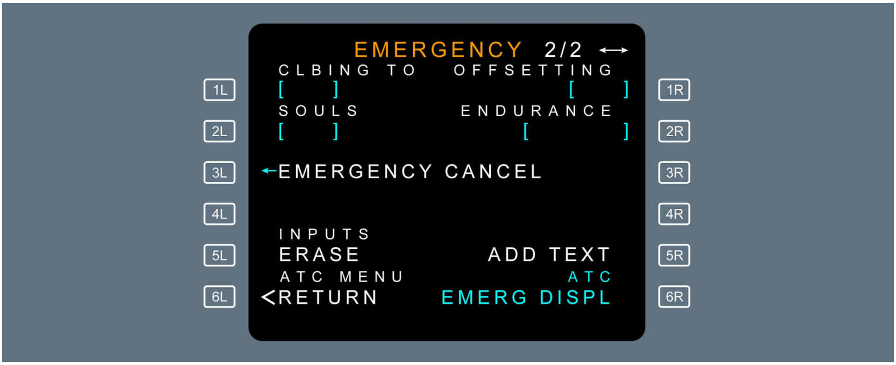


```
          EMERGENCY  1/2 ←→
       EMERG ADS-C:OFF
←MAYDAY             SET ON*
          DESCENDING TO
←PANPAN             [     ]
           DIVERTING/VIA
                [    ]/[   ]
 VOICE               FREQ
←CONTACT----[             ]
 INPUTS
 ERASE            ADD TEXT
 ATC MENU              ATC
<RETURN        EMERG DISPL
```

[1L] MAYDAY	Generates a downlink message that indicates a critical failure on board.
[2L] PANPAN	Generates a downlink message that indicates a major failure on board.
[4L] VOICE CONTACT	Requests voice contact with the ATC. The default frequency is 121.5 MHz.
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases the data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] SET OFF or SET ON	Activates, or deactivates the ADS-C emergency mode. The title line displays the mode status: - EMERG ADS-C: ON, when the mode is activated - EMERG ADS-C:OFF, when the mode is not activated.
[2R] DESCENDING TO	Displays the FCU-selected altitude of the descent.
[3R] DIVERTING/VIA	Enters the route, or airport, the aircraft is diverting to.
[4R] FREQ	Enters the requested voice frequency of voice contact with the ATC.

[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT activates, while a message is being created.
[6R] ATC EMERG DISPL	When selected, the DCDU displays prepared emergency message.

EMERGENCY PAGE 2/2

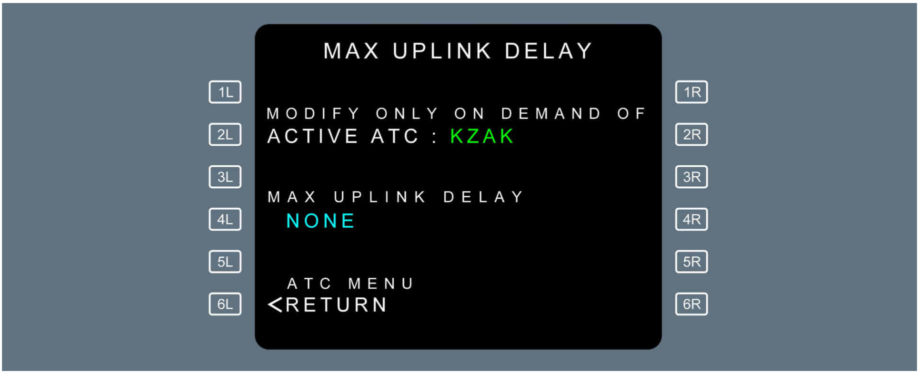

EMERGENCY 2/2 ←→
CLBING TO
OFFSETTING
[ ]
[ ]
SOULS
ENDURANCE
[ ]
[ ]
←EMERGENCY CANCEL
INPUTS
ERASE
ADD TEXT
ATC MENU
<RETURN
ATC
EMERG DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] CLBING TO	Displays the FCU-selected altitude of the climb.
[2L] SOULS	Enters the number of passengers on board. *Note:* *SOULS and ENDURANCE fields are linked:* - *If one field is cleared, this automatically clears the other.* - *If one field is filled in, this automatically fills in the other.* - *If a field is empty, it is filled in with a default values (999 for SOULS and 0 h 00 for ENDURANCE).*
[3L] EMERGENCY CANCEL	Cancels the previous emergency message. *Note:* *If EMERGENCY CANCEL is selected, it deselects the PANPAN or MAYDAY items, and deactivates the ADS-C emergency mode.*
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] OFFSETTING	Enters the offset value from the flight plan.
[2R] ENDURANCE	Enters the maximum remaining flight time, limited by fuel autonomy.

[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT activates, while a message is being created.
[6R] ATC EMERG DISPL	When selected, the DCDU displays prepared emergency message.

MAX UPLINK DELAY

Ident.: DSC-46-10-40-30-00021090.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



MAX UPLINK DELAY

MODIFY ONLY ON DEMAND OF
ACTIVE ATC : KZAK

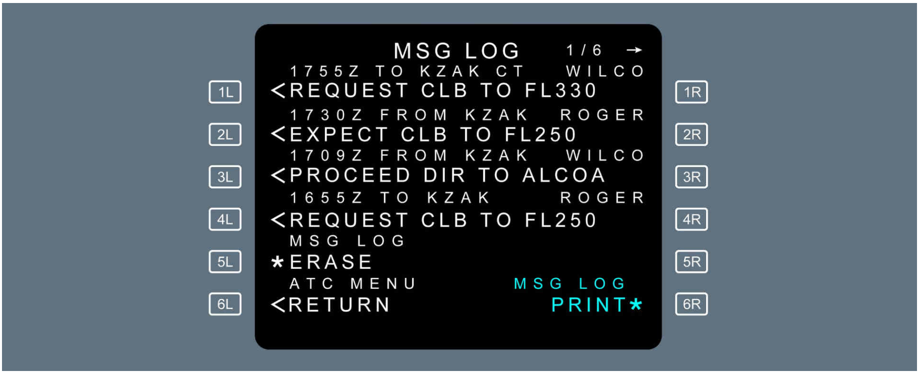
MAX UPLINK DELAY
NONE

ATC MENU
<RETURN

[2L] ACTIVE ATC	Indicates the ICAO code of active ATC center. When no active ATC connection is established, four dashes “----“ replace the ICAO code.
[4L] MAX UPLINK DELAY	Displays the maximum delay that is authorized for an ATC answer. The maximum delay is NONE by default. If the NONE of max uplink delay is set, datalink messages are not rejected, due to a long transmission time. *Note:* *The flight crew should not modify this field, unless they are instructed to do so.*
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.

MSG LOG

Ident.: DSC-46-10-40-30-00021091.0001001 / 21 MAR 17
Applicable to: ALL

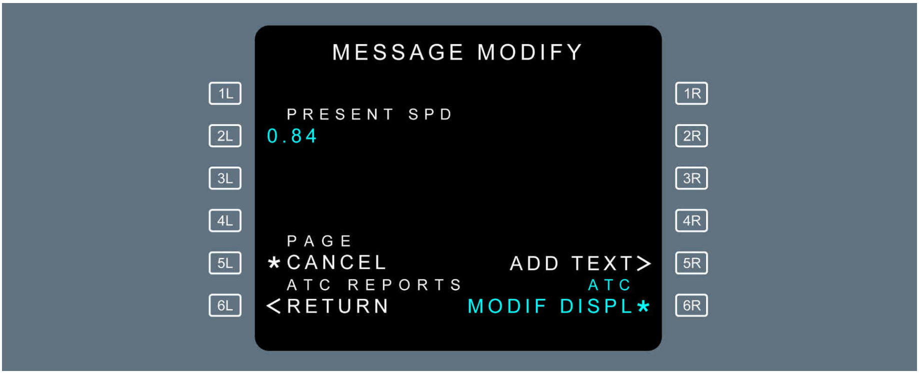


```
         MSG LOG      1/6 →
 1755Z TO KZAK CT     WILCO
<REQUEST CLB TO FL330
 1730Z FROM KZAK     ROGER
<EXPECT CLB TO FL250
 1709Z FROM KZAK     WILCO
<PROCEED DIR TO ALCOA
 1655Z TO KZAK       ROGER
<REQUEST CLB TO FL250
 MSG LOG
*ERASE
 ATC MENU          MSG LOG
<RETURN             PRINT*
```

Lines 1 to 4	Display a summary of each recorded message: - Time - ATC center - Message status - Beginning of the message The latest recorded message is displayed at the top of the message record list. Pressing the left key, adjacent to each message title, displays full content of recorded message.
[5L] MSG LOG ERASE	Clears all the recorded messages. When pressing MSG LOG ERASE, MSG LOG ERASE is replaced by ERASE MSG LOG CONFIRM, in order to prevent an inadvertent erase.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[6R] MSG RECORD PRINT	When selected, the printer prints all recorded messages.

MESSAGE MODIFY

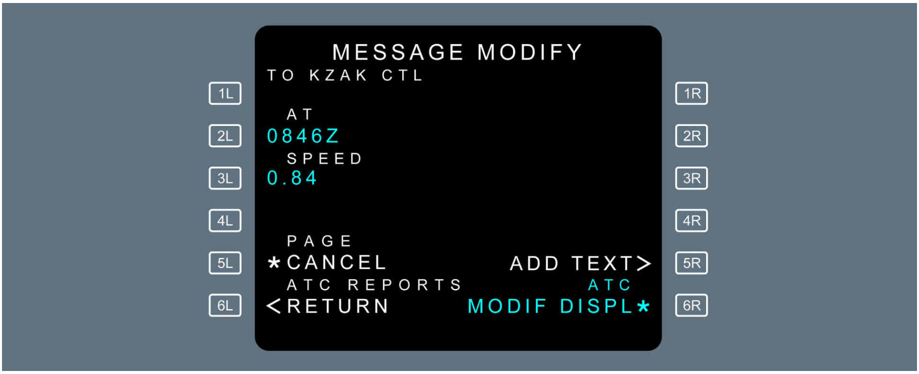
Ident.: DSC-46-10-40-30-00021095.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU


MESSAGE MODIFY
PRESENT SPD
0.84
PAGE
*CANCEL
ADD TEXT>
ATC REPORTS
<RETURN
ATC
MODIF DISPL*

Lines 2 and 3	Displays the label and parameters that can be modified.
[5L] PAGE CANCEL	Cancels the message modification. When the MESSAGE MODIFY page is closed, the MCDU displays the ATC MENU page and the function keys of the DCDU update.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active while a message is being created.
[6R] ATC MODIF DISPL	When selected, the DCDU displays prepared message.

MESSAGE MODIFY

Ident.: DSC-46-10-40-30-00021095.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

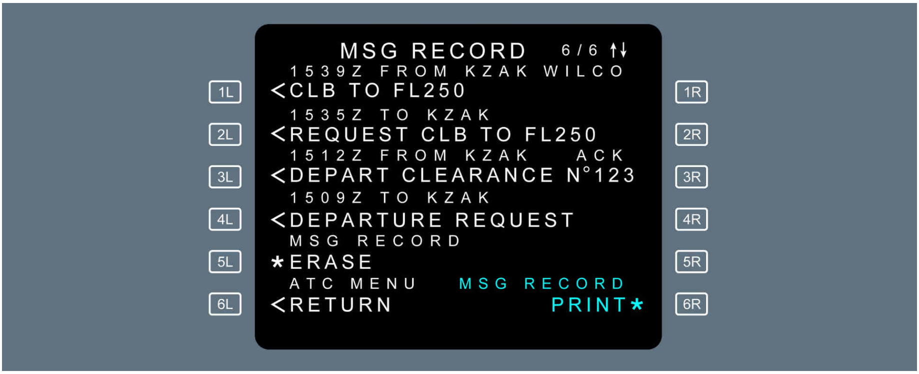


```
           MESSAGE MODIFY
TO KZAK CTL

  AT
0846Z
  SPEED
0.84


  PAGE
*CANCEL                ADD TEXT>
  ATC REPORTS               ATC
<RETURN           MODIF DISPL*
```

Line 1	Displays the name of the current ATC center.
Lines 2 and 3	Displays the label and parameters that can be modified.
[5L] PAGE CANCEL	When selected, the MCDU displays the ATC MENU page.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[5R] ADD TEXT	When selected, the MCDU displays TEXT page. ADD TEXT is active while a message is being created.
[6R] ATC MODIF DISPL	When selected, the DCDU displays prepared message.

MSG RECORD

Ident.: DSC-46-10-40-30-00021150.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

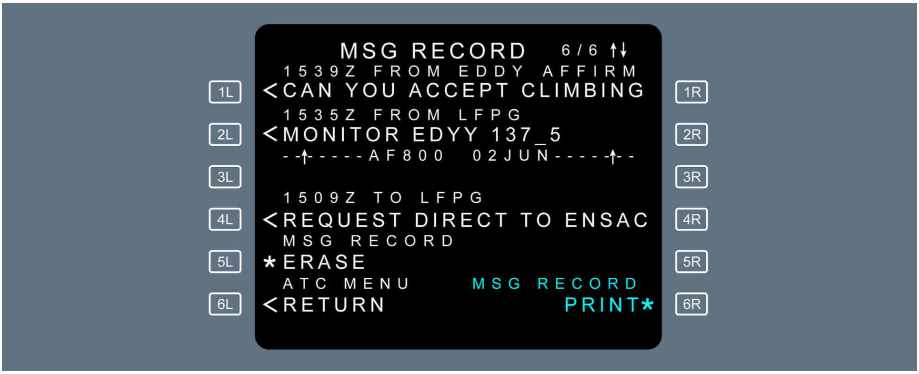


```
      MSG RECORD      6/6 ↑↓
  1539Z FROM KZAK WILCO
<CLB TO FL250
  1535Z TO KZAK
<REQUEST CLB TO FL250
  1512Z FROM KZAK    ACK
<DEPART CLEARANCE N°123
  1509Z TO KZAK
<DEPARTURE REQUEST
  MSG RECORD
*ERASE
  ATC MENU      MSG RECORD
<RETURN             PRINT*
```

Lines 1 to 4	Display a summary of each recorded message: - Time - ATC center - Message status - Beginning of the message The latest recorded message is displayed at the top of the message record list. Pressing the left key, adjacent to each message title, displays full content of recorded message.
[5L] MSG RECORD ERASE	Clears all the recorded messages. When pressing MSG RECORD ERASE, MSG RECORD ERASE is replaced by ERASE MSG RECORD CONFIRM, in order to prevent an inadvertent erase.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[6R] MSG RECORD PRINT	When selected, the printer prints all recorded messages.

Note: *If sending a downlink message fails, the message appears in white on the MSG RECORD page.*

EXAMPLE	Indication of Flight Number Change When the flight number changes, a specific message with the new flight number value is stored in the message record.

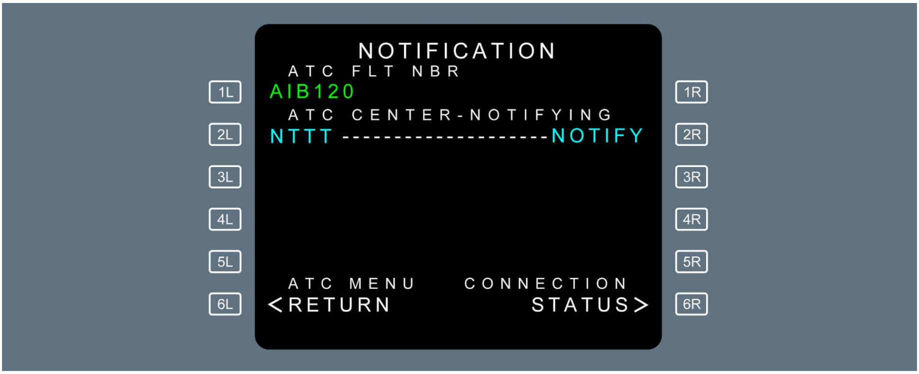


```
     MSG RECORD       6/6 ↑↓
 1539Z FROM EDDY   AFFIRM
<CAN YOU ACCEPT CLIMBING
 1535Z FROM LFPG
<MONITOR EDYY 137_5
 --↑----AF800  02JUN----↑--

 1509Z TO LFPG
<REQUEST DIRECT TO ENSAC
 MSG RECORD
*ERASE
 ATC MENU          MSG RECORD
<RETURN                PRINT*
```

EXAMPLE	Line 3	:	The specific message of the flight number change, indicating: - New flight number - Date of change.

NOTIFICATION

Ident.: DSC-46-10-40-30-00021087.0001001 / 21 MAR 17
Applicable to: ALL



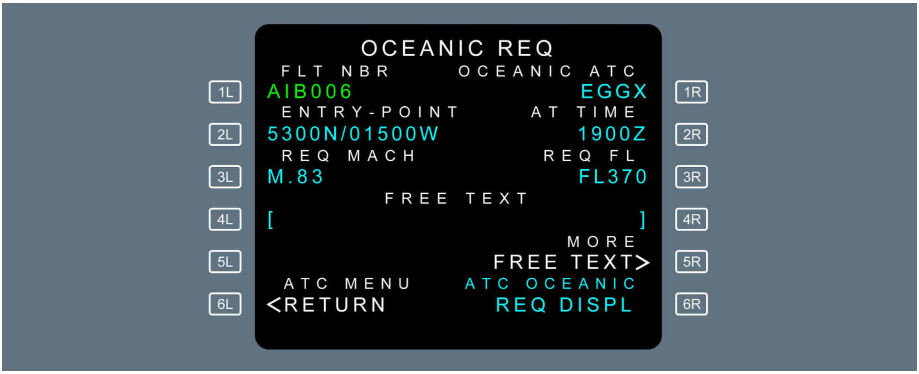
```
       NOTIFICATION
 ATC FLT NBR
AIB120
 ATC CENTER-NOTIFYING
NTTT -------------------NOTIFY








 ATC MENU      CONNECTION
<RETURN           STATUS>
```

[1L] ATC FLT NBR	Displays the flight number, filled by the FMGES. The FLT NBR cannot be modified via this page.

Line 2 ATC CENTER	Displays the logon status in front of the ATC CENTER. The logon status can indicate: - NOTIFYING indicates that the logon is in progress. - NOTIF FAILED indicates that the logon has failed. The logon status disappears, when the logon notification is completed.
[2L] ATC CENTER	Enters the ATC ICAO code for notification. The entered ATC ICAO code is displayed in large cyan font. *Note:* *At initialization, a default code is displayed in small cyan font, and corresponds to one of following options:* - *Last active ATC with which an active CPDLC connection was previously established* - *Last manually-entered ATC code* - *4 amber boxes appear.*
[4L]	Displays the last ATC center, to which a successful logon notification was performed. *Note:* *NOTIFICATION UNAVAILABLE is displayed in line 5, if the communication means, the aircraft position, or the flight number are unavailable.*
[2R] NOTIFY	Sends a notification to the ATC. NOTIFY is not active, if the communication means, the aircraft position, or flight number are unavailable.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[6R] CONNECTION STATUS	When selected, the MCDU displays the CONNECTION STATUS page.

OCEANIC REQ

Ident.: DSC-46-10-40-30-00021098.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



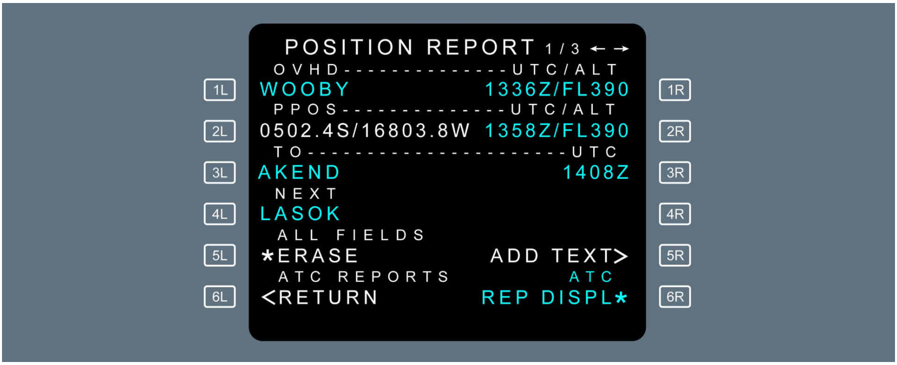
OCEANIC REQ
FLT NBR   OCEANIC ATC
AIB006   EGGX
ENTRY-POINT   AT TIME
5300N/01500W   1900Z
REQ MACH   REQ FL
M.83   FL370
FREE TEXT
[   ]
MORE
FREE TEXT>
ATC MENU   ATC OCEANIC
<RETURN   REQ DISPL

[1L] FLT NBR	The ATC flight number is automatically displayed by the system. The ATC flight number may be modified on the FMS INIT page.
[2L] ENTRY-POINT	Enters the entry-point (fixname or LAT/LONG coordinates) of the expected oceanic route.
[3L] REQ MACH	Enters the requested Mach number at entry-point.
[4L] FREE TEXT	Enters a free text.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] OCEANIC ATC	Enters the ATC center to which the oceanic request will be sent.
[2R] AT TIME	Enters the required time of entry in the oceanic route.
[3R] REQ FL	Enters the requested altitude at entry-point.
[5R] MORE FREE TEXT	When selected, the MCDU displays the TEXT page, in order to add more free text in the message.
[6R] ATC OCEANIC REQ DISPL	When selected, the DCDU displays prepared oceanic request.

POSITION REPORT

Ident.: DSC-46-10-40-30-00021076.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

POSITION REPORT PAGE 1/3

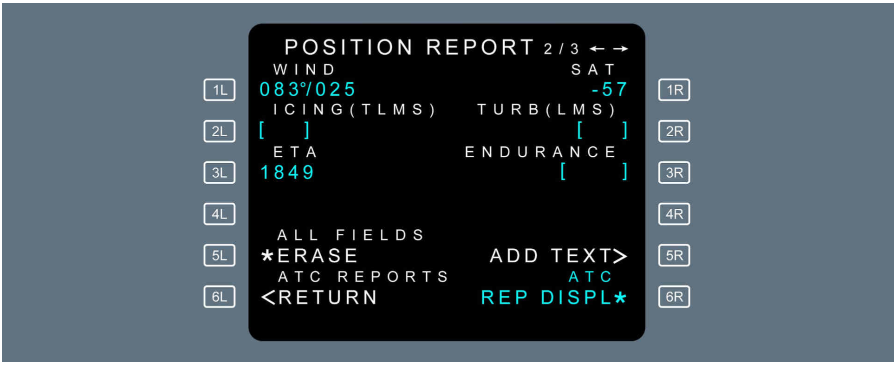


```
     POSITION REPORT 1/3 ←→
   OVHD--------------UTC/ALT
1L WOOBY         1336Z/FL390 1R
   PPOS--------------UTC/ALT
2L 0502.4S/16803.8W 1358Z/FL390 2R
   TO---------------------UTC
3L AKEND               1408Z 3R
   NEXT
4L LASOK                     4R
   ALL FIELDS
5L *ERASE          ADD TEXT> 5R
   ATC REPORTS           ATC
6L <RETURN       REP DISPL* 6R
```

Note: *The FMGES automatically fills the data into all fields. The pilot can overwrite these data.*

[1L] OVHD	Displays the last-reported waypoint. OVHD corresponds to the last-sequenced waypoint.
[2L] PPOS	Displays the aircraft's present position.
[3L] TO	Displays the TO waypoint of the flight plan.
[4L] NEXT	Displays the NEXT waypoint of the flight plan.
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[1R] UTC/ALT	Displays the time and altitude at the last-reported waypoint.
[2R] UTC/ALT	Displays the time and altitude at the aircraft's present position.
[3R] UTC	Displays the predicted time of arrival at the following waypoint.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REP DISPL	When selected, the DCDU displays prepared message.

POSITION REPORT PAGE 2/3

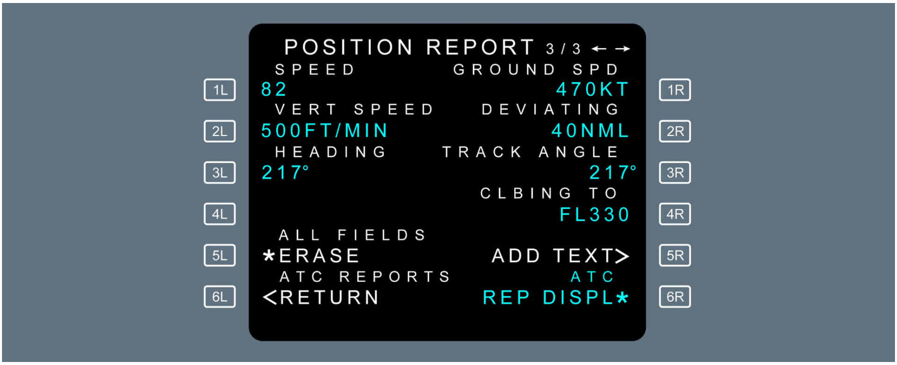


```
POSITION REPORT 2/3 ←→
 WIND                     SAT
083°/025                  -57
 ICING(TLMS)        TURB(LMS)
[   ]                    [  ]
 ETA                ENDURANCE
1849                   [    ]

 ALL FIELDS
*ERASE              ADD TEXT>
 ATC REPORTS              ATC
<RETURN            REP DISPL*
```

Note: *The FMGES automatically fills the data into fields of Wind, ETA, and SAT. The pilot can overwrite these data.*

[1L] WIND	Displays the current wind (speed and direction).
[2L] ICING (TLMS)	Enters the level of icing: - T for Trace icing - L for Light icing - M for Moderate icing - S for Severe Icing.
[3L] ETA	Displays the Estimated Time at Arrival.
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[1R] SAT	Displays the Static Air Temperature (SAT).
[2R] TURB (LMS)	Enters the level of turbulence: - L for Light turbulence - M for Moderate turbulence - S for Severe turbulence.
[3R] ENDURANCE	Enters the remaining fuel and corresponding flight time.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REP DISPL	When selected, the DCDU displays prepared message.

POSITION REPORT PAGE 3/3



```
 POSITION REPORT 3/3 ←→
 SPEED          GROUND SPD
82                  470KT
 VERT SPEED      DEVIATING
500FT/MIN           40NML
 HEADING       TRACK ANGLE
217°                 217°
                 CLBING TO
                    FL330
 ALL FIELDS
*ERASE           ADD TEXT>
 ATC REPORTS           ATC
<RETURN        REP DISPL*
```

<u>Note:</u> The FMGES automatically fills the data into all fields. The pilot can overwrite these data.

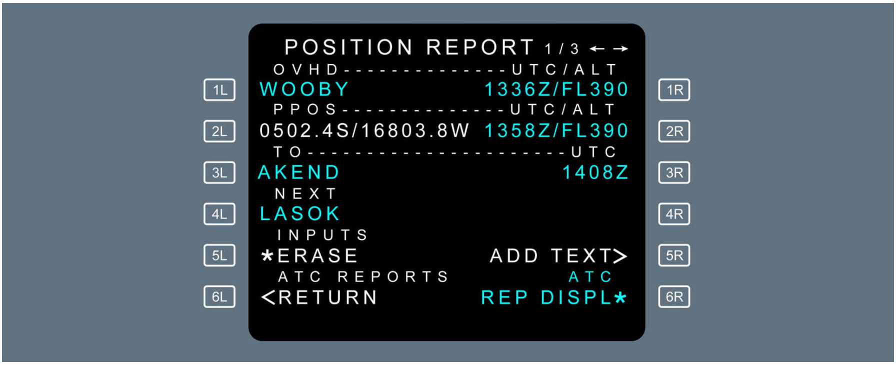
[1L] SPEED	Displays the current speed.
[2L] VERT SPEED	Displays the current vertical speed.
[3L] HEADING	Displays the current true heading.
[4L] DSCENDING TO	Displays the current descending target altitude, if any.
	<u>Note:</u> The DSCENDING TO displays, if: *- a valid target of descend altitude is in the FMGES, or* *- the FMGES fails, or* *- the FMGES is turned OFF.*
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[1R] GROUND SPD	Displays the current ground speed.
[2R] DEVIATING	Displays the current offset from the flight plan.
[3R] TRACK ANGLE	Displays the current track angle.
[4R] CLBING TO	Displays the current climbing target altitude, if any.
	<u>Note:</u> CLBING TO displays, if: *- a valid target of climbing altitude is in the FMGES, or* *- the FMGES fails, or* *- the FMGES is turned OFF.*

[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REP DISPL	When selected, the DCDU displays prepared message.

POSITION REPORT

Ident.: DSC-46-10-40-30-00021076.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

POSITION REPORT PAGE 1/3

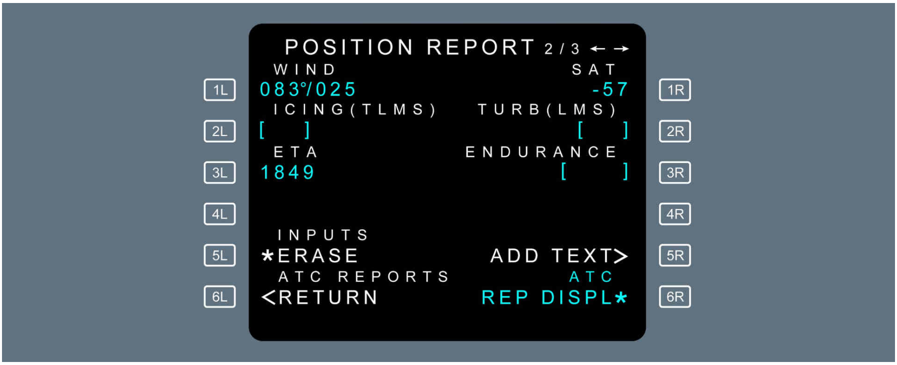


```
  POSITION REPORT 1/3 ←→
 OVHD-------------UTC/ALT
WOOBY          1336Z/FL390
 PPOS-------------UTC/ALT
0502.4S/16803.8W 1358Z/FL390
 TO---------------------UTC
AKEND                1408Z
 NEXT
LASOK
 INPUTS
*ERASE           ADD TEXT>
 ATC REPORTS           ATC
<RETURN        REP DISPL*
```

Note: The FMGES automatically fills the data into all fields. The pilot can overwrite these data.

[1L] OVHD	Displays the last-reported waypoint. OVHD corresponds to the last-sequenced waypoint.
[2L] PPOS	Displays the aircraft's present position.
[3L] TO	Displays the TO waypoint of the flight plan.
[4L] NEXT	Displays the NEXT waypoint of the flight plan.
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[1R] UTC/ALT	Displays the time and altitude at the last-reported waypoint.
[2R] UTC/ALT	Displays the time and altitude at the aircraft's present position.
[3R] UTC	Displays the predicted time of arrival at the following waypoint.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REP DISPL	When selected, the DCDU displays prepared message.

POSITION REPORT PAGE 2/3

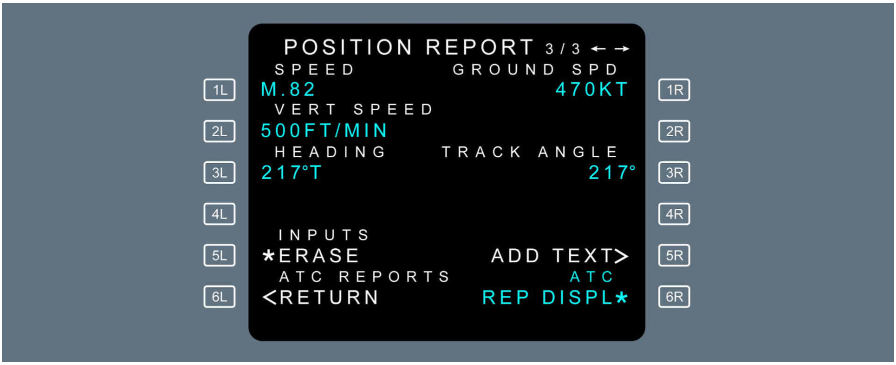


```
POSITION REPORT 2/3 ←→
 WIND                       SAT
083°/025                    -57
 ICING(TLMS)         TURB(LMS)
[   ]                   [    ]
 ETA                 ENDURANCE
1849                  [      ]

 INPUTS
*ERASE                ADD TEXT>
 ATC REPORTS                ATC
<RETURN             REP DISPL*
```

Note: *The FMGES automatically fills the data into fields of Wind, ETA, and SAT. The pilot can overwrite these data.*

[1L] WIND	Displays the current wind (speed and direction).
[2L] ICING (TLMS)	Enters the level of icing: - T for Trace icing - L for Light icing - M for Moderate icing - S for Severe Icing.
[3L] ETA	Displays the Estimated Time at Arrival.
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[1R] SAT	Displays the Static Air Temperature (SAT).
[2R] TURB (LMS)	Enters the level of turbulence: - L for Light turbulence - M for Moderate turbulence - S for Severe turbulence.
[3R] ENDURANCE	Enters the remaining fuel and corresponding flight time.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REP DISPL	When selected, the DCDU displays prepared message.

POSITION REPORT PAGE 3/3



```
  POSITION REPORT 3/3 ←→
 SPEED          GROUND SPD
M.82                 470KT
 VERT SPEED
500FT/MIN
 HEADING       TRACK ANGLE
217°T                 217°


 INPUTS
*ERASE           ADD TEXT>
 ATC REPORTS           ATC
<RETURN        REP DISPL*
```

Note: The FMGES automatically fills the data into all fields. The pilot can overwrite these data.

[1L] SPEED	Displays the current speed.
[2L] VERT SPEED	Displays the current vertical speed.
[3L] HEADING	Displays the current true heading.
[4L] DSCENDING TO	Displays the current descending target altitude, if any. *Note: The DSCENDING TO displays, if:* *- a valid target of descend altitude is in the FMGES, or* *- the FMGES fails, or* *- the FMGES is turned OFF.*
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases data that were entered on other associated pages.
[6L] ATC REPORTS RETURN	When selected, the MCDU displays the ATC REPORTS page.
[1R] GROUND SPD	Displays the current ground speed.
[2R] DEVIATING	Displays the current offset from the flight plan.
[3R] TRACK ANGLE	Displays the current track angle.
[4R] CLBING TO	Displays the current climbing target altitude, if any. *Note: CLBING TO displays, if:* *- a valid target of climbing altitude is in the FMGES, or* *- the FMGES fails, or* *- the FMGES is turned OFF.*

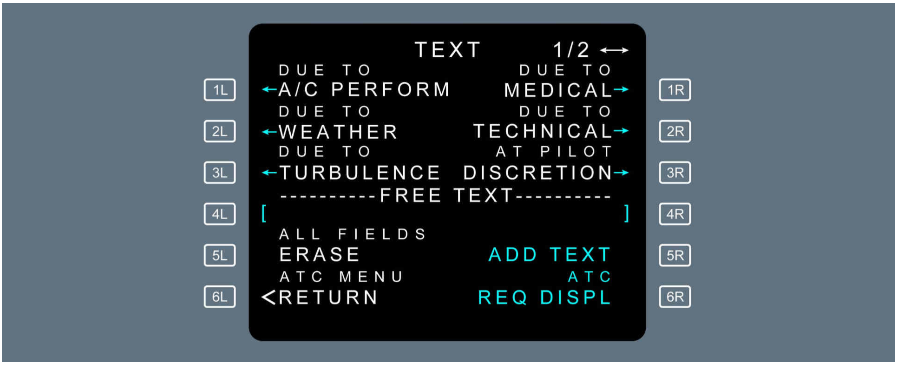
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REP DISPL	When selected, the DCDU displays prepared message.

TEXT

Ident.: DSC-46-10-40-30-00021084.0002001 / 21 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

TEXT PAGE 1/2



```
                 TEXT         1/2 ←→
  DUE TO                     DUE TO
←A/C PERFORM               MEDICAL→
  DUE TO                     DUE TO
←WEATHER                 TECHNICAL→
  DUE TO                   AT PILOT
←TURBULENCE             DISCRETION→
  ----------FREE TEXT----------
[                                  ]
  ALL FIELDS
  ERASE                    ADD TEXT
  ATC MENU                      ATC
<RETURN                    REQ DISPL
```

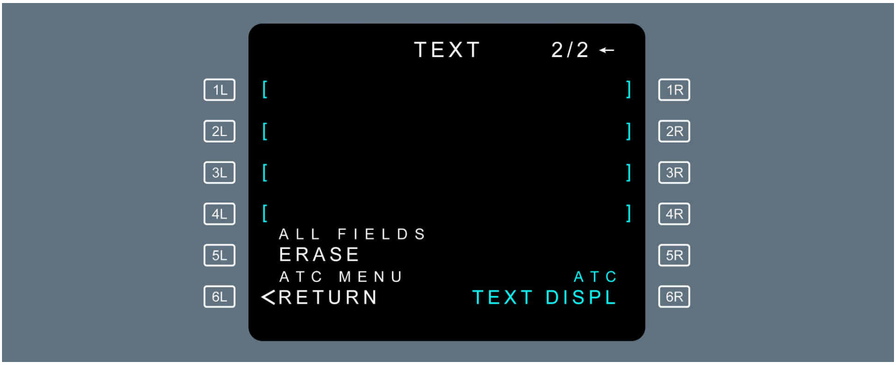
[1L] DUE TO A/C PERFORM	When selected, DUE TO A/C PERFORM justification is inserted into the datalink message.
[2L] DUE TO WEATHER	When selected, DUE TO WEATHER conditions (justification) is inserted into the datalink message.

Note: *When the pilot reports an offset, due to a weather, the DCDU will not display the direction of the offset.*

[3L] DUE TO TURBULENCE	When selected, DUE TO TURBULENCE justification is inserted into the datalink message.
[4L] FREE TEXT	Adds a free text to any request. If more than one line is necessary, proceed to the TEXT page 2/2.
[5L] ALL FIELDS ERASE	Erases all data that were entered.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] DUE TO MEDICAL	When selected, DUE TO MEDICAL justification is inserted into the datalink message.

[2R] DUE TO TECHNICAL	When selected, DUE TO TECHNICAL justification is inserted into the datalink message.
[3R] AT PILOT DISCRETION	When selected, AT PILOT DISCRETION is inserted into the datalink message, in order to request an authorization to freely execute clearance.
[6R] ATC XXX DISPL	When selected, the DCDU displays prepared message. XXX refers to a page that is associated with the free text: - TEXT (no associated page) - REQ (request pages) - EMERG (emergency pages) - REP (position report pages) - MODIF (modify page)

TEXT PAGE 2/2


TEXT 2/2 ←

[ ]

[ ]

[ ]

[ ]

ALL FIELDS
ERASE

ATC MENU
<RETURN

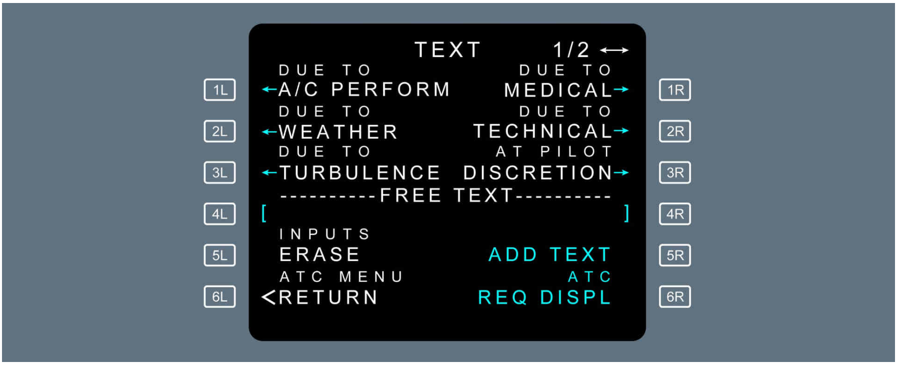
ATC
TEXT DISPL

Lines 1 to 4	Adds a free text to any request. If text has been written on the fourth line of page 1, this line reappears on the first line of page 2.
[5L] ALL FIELDS ERASE	Erases all data that was entered on the page, and erases the data that was entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[6R] ATC TEXT DISPL	When selected, the DCDU displays prepared message.

TEXT

Ident.: DSC-46-10-40-30-00021084.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP

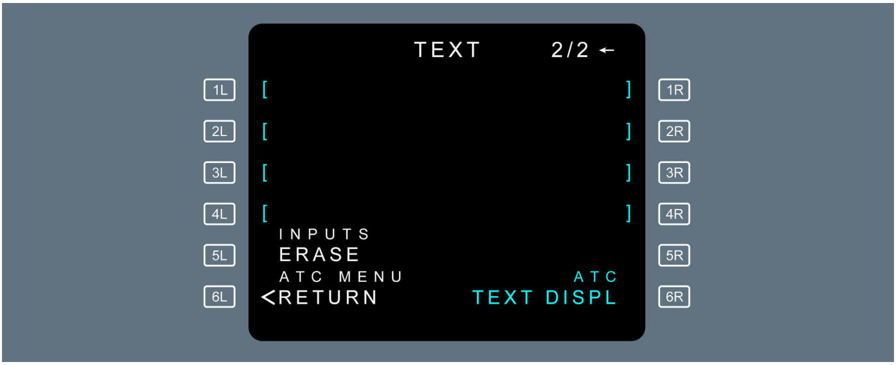
TEXT PAGE 1/2


TEXT 1/2 ←→
DUE TO
←A/C PERFORM
DUE TO
MEDICAL→
DUE TO
←WEATHER
DUE TO
TECHNICAL→
DUE TO
←TURBULENCE
AT PILOT
DISCRETION→
----------FREE TEXT----------
[ ]
INPUTS
ERASE
ADD TEXT
ATC MENU
<RETURN
ATC
REQ DISPL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

[1L] DUE TO A/C PERFORM	When selected, DUE TO A/C PERFORM justification is inserted into the datalink message.
[2L] DUE TO WEATHER	When selected, DUE TO WEATHER conditions (justification) is inserted into the datalink message. _Note:_ *When the pilot reports an offset, due to a weather, the DCDU will not display the direction of the offset.*
[3L] DUE TO TURBULENCE	When selected, DUE TO TURBULENCE justification is inserted into the datalink message.
[4L] FREE TEXT	Adds a free text to any request. If more than one line is necessary, proceed to the TEXT page 2/2.
[5L] INPUTS ERASE	Erases all data that were entered.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] DUE TO MEDICAL	When selected, DUE TO MEDICAL justification is inserted into the datalink message.
[2R] DUE TO TECHNICAL	When selected, DUE TO TECHNICAL justification is inserted into the datalink message.
[3R] AT PILOT DISCRETION	When selected, AT PILOT DISCRETION is inserted into the datalink message, in order to request an authorization to freely execute clearance.

[6R] ATC XXX DISPL	When selected, the DCDU displays prepared message. XXX refers to a page that is associated with the free text: - TEXT (no associated page) - REQ (request pages) - EMERG (emergency pages) - REP (position report pages) - MODIF (modify page)

TEXT PAGE 2/2



TEXT 2/2 ←

[ ]

[ ]

[ ]

[ ]

INPUTS
ERASE

ATC MENU
<RETURN

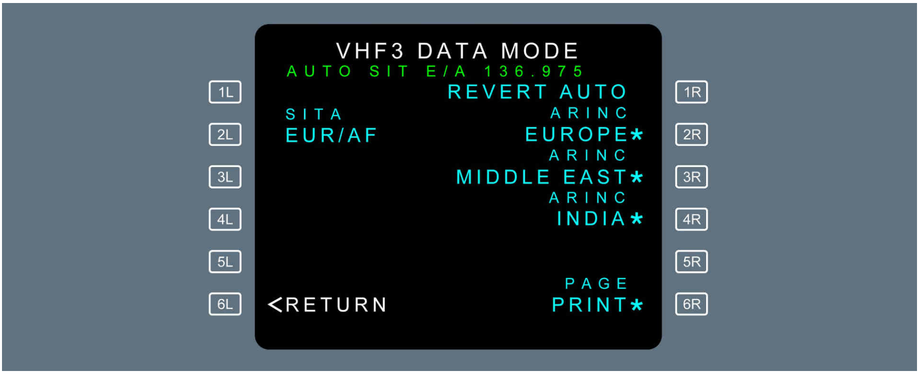
ATC
TEXT DISPL

Lines 1 to 4	Adds a free text to any request. If text has been written on the fourth line of page 1, this line reappears on the first line of page 2.
[5L] INPUTS ERASE	Erases all data that was entered on the page, and erases the data that was entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[6R] ATC TEXT DISPL	When selected, the DCDU displays prepared message.

VHF3 DATA MODE

Ident.: DSC-46-10-40-30-00021077.0001001 / 22 MAR 17
Applicable to: ALL

EXAMPLE	This is an example of the VHF3 DATA MODE page. Information, that are displayed on the VHF3 DATA MODE page, depend on the service provider and datalink customization, selected by each operator. The VHF3 DATA MODE displays regions, and associated frequencies of datalink service providers that were selected.



VHF3 DATA MODE
AUTO SIT E/A 136.975
REVERT AUTO
SITA
EUR/AF
ARINC
EUROPE*
ARINC
MIDDLE EAST*
ARINC
INDIA*
PAGE
<RETURN
PRINT*

EXAMPLE		

	Line 1	Displays:
		- Mode of VHF provider selection:
		  - MANUAL
		    The VHF 3 is tuned to a frequency manually selected by the flight crew via the VHF3 DATA MODE page.
		  - AUTO
		    The VHF 3 is tuned to a frequency automatically selected by the ATSU.
		  - VOICE
		    The VHF 3 is in the voice mode.
		  - SCAN
		    The VHF 3 system scans for a data frequency.
		  - AUTO DATA INHIB
		    No datalink service provider is available in the area.
		- Datalink service provider identification
		- The frequency of the service provide that the system is tuned to

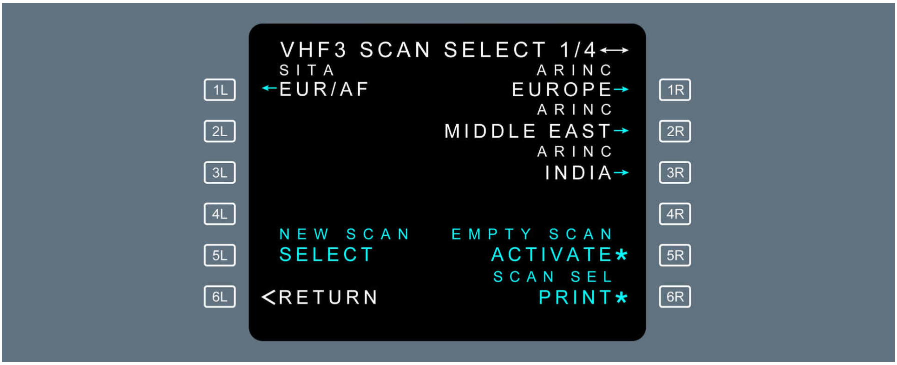
	[2L] SITA EUR/AF	Displays the service provider (SITA Europe/Africa). In this example, the ATSU is connected to the provider SITA Europe/Africa (136.975 MHz).
	[6L] RETURN	When selected, the MCDU displays the COMM MENU page.
	[1R] REVERT AUTO	Reverts to VHF 3 auto-tuning.
	[2R] ARINC EUROPE	When selected, the VHF 3 tunes to the frequency of the ARINC EUROPE provider. The mode of VHF provider selection changes to MANUAL.
	[3R] ARINC MIDDLE EAST	When selected, the VHF 3 tunes to the frequency of the ARINC MIDDLE EAST provider. The mode of VHF provider selection changes to MANUAL.
	[4R] ARINC INDIA	When selected, the VHF 3 tunes to the frequency of the ARINC INDIA provider. The mode of VHF provider selection changes to MANUAL.
	[6R] PAGE PRINT	When selected, the printer prints information from the VHF3 DATA MODE page.

VHF3 SCAN SELECT

Ident.: DSC-46-10-40-30-00021079.0001001 / 21 MAR 17
Applicable to: ALL

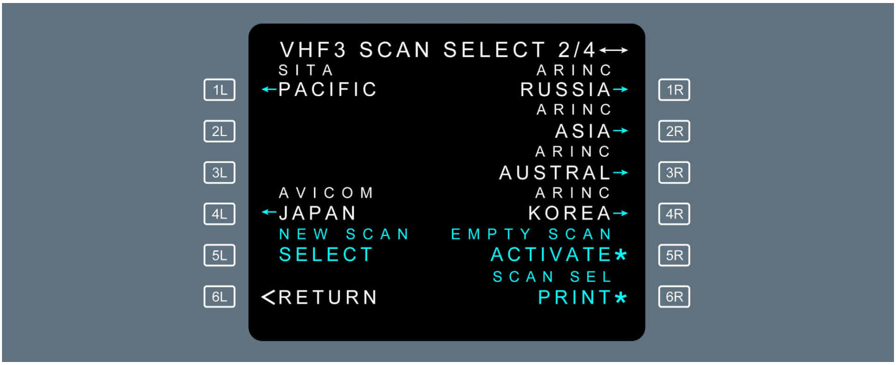
EXAMPLE	This is an example of VHF3 SCAN SELECT pages. Information, that are displayed on the VHF3 SCAN SELECT pages, depend on datalink customization, selected by each operator.

THE VHF 3 SCAN SELECT PAGE 1/4


VHF3 SCAN SELECT 1/4←→
SITA
←EUR/AF
ARINC
EUROPE→
ARINC
MIDDLE EAST→
ARINC
INDIA→
NEW SCAN
SELECT
EMPTY SCAN
ACTIVATE*
SCAN SEL
<RETURN
PRINT*

EXAMPLE	[1L] SITA EUR/AF	Selects the SITA Europe/Africa (datalink service provider).
	[5L]: NEW SCAN SELECT : ACTIVE SEL DISPLAY :	 Selects the scan mask. Displays the scan mask used by ATSU.
	[6L] RETURN	When selected, the MCDU displays the COMM CONFIG page.
	[1R] ARINC EUROPE	Selects the ARINC Europe (datalink service provider).
	[2R] ARINC MIDDLE EAST	Selects the ARINC Eiddle East (datalink service provider).
	[3R] ARINC INDIA	Selects the ARINC India (datalink service provider).
	[5R] EMPTY SCAN ACTIVATE	Activates an emprty scan mask to inhibit VHF datalink communication.
	[6R] SCAN SEL PRINT	When selected, the printer prints information.

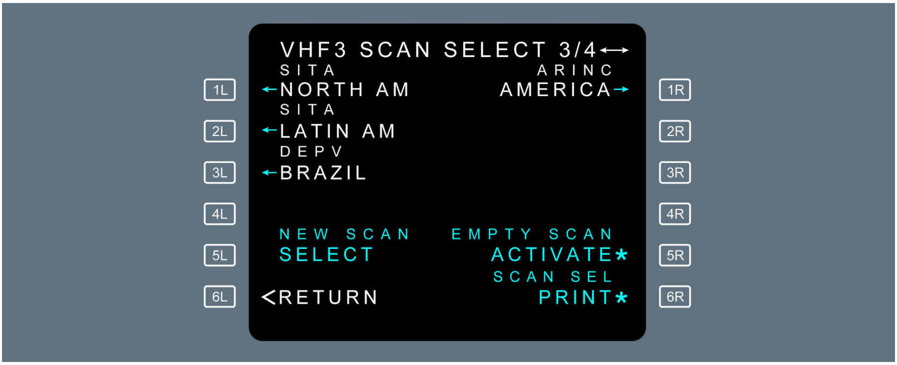
THE VHF 3 SCAN SELECT PAGE 2/4



```
 VHF3 SCAN SELECT 2/4←→
 SITA                ARINC
←PACIFIC            RUSSIA→
                     ARINC
                      ASIA→
                     ARINC
                   AUSTRAL→
 AVICOM              ARINC
←JAPAN               KOREA→
 NEW SCAN       EMPTY SCAN
 SELECT          ACTIVATE*
                  SCAN SEL
<RETURN             PRINT*
```

EXAMPLE	[1L] SITA PACIFIC	Selects the SITA Pacific (datalink service provider).
	[4L] AVICOM JAPAN	Selects the AVCOM Japan (datalink service provider).
	[5L]: NEW SCAN SELECT : ACTIVE SEL DISPLAY :	 Selects the scan mask. Displays the scan mask used by ATSU.
	[6L] RETURN	When selected, the MCDU displays the COMM CONFIG page.
	[1R] ARINC RUSSIA	Selects the ARINC Russia (datalink service provider).
	[2R] ARINC ASIA	Selects the ARINC Asia (datalink service provider).
	[3R] ARINC AUSTRAL	Selects the ARINC Australia (datalink service provider).
	[4R] ARINC KOREA	Selects the ARINC Korea (datalink service provider).
	[5R] EMPTY SCAN ACTIVATE	Activates an emprty scan mask, in order to inhibit VHF datalink communication.
	[6R] SCAN SEL PRINT	When selected, the printer prints information.

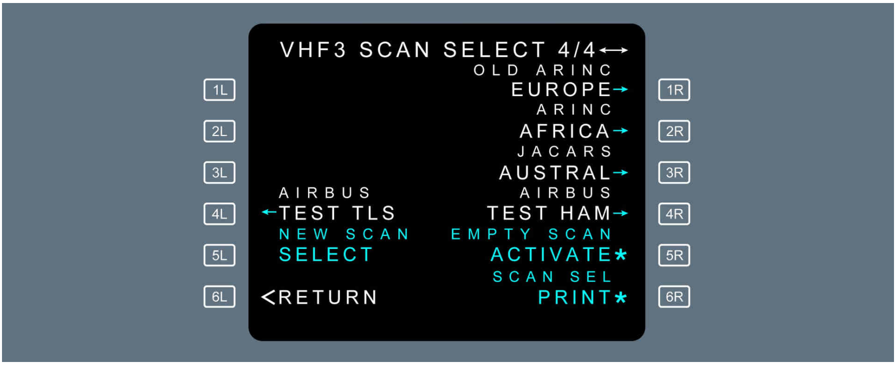
THE VHF 3 SCAN SELECT PAGE 3/4



```
 VHF3 SCAN SELECT 3/4←→
 SITA              ARINC
←NORTH AM        AMERICA→
 SITA
←LATIN AM
 DEPV
←BRAZIL

 NEW SCAN    EMPTY SCAN
 SELECT        ACTIVATE*
                SCAN SEL
<RETURN           PRINT*
```

EXAMPLE	[1L] SITA NORTH AM	Selects the SITA North America (datalink service provider).
	[2L] SITA SOUTH AM	Selects the SITA South America (datalink service provider).
	[3L] DEPV BRASIL	Selects the DEPV Brasil (datalink service provider).
	[5L]: NEW SCAN SELECT : ACTIVE SEL DISPLAY :	 Selects the scan mask. Displays the scan mask used by ATSU.
	[6L] RETURN	When selected, the MCDU displays the COMM CONFIG page.
	[1R] ARINC AMERICA	Selects the ARINC America (datalink service provider).
	[5R] EMPTY SCAN ACTIVATE	Activates an emprty scan mask, in order to inhibit VHF datalink communication.
	[6R] SCAN SEL PRINT	When selected, the printer prints information.

THE VHF 3 SCAN SELECT PAGE 4/4



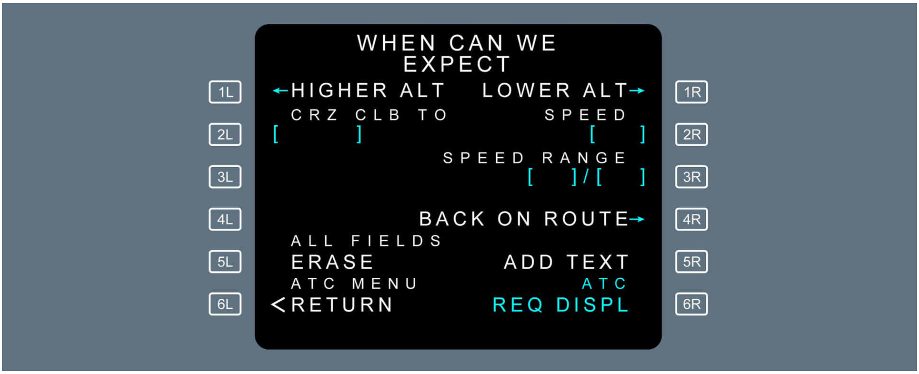
VHF3 SCAN SELECT 4/4←→

	OLD ARINC EUROPE→
	ARINC AFRICA→
	JACARS AUSTRAL→
AIRBUS ←TEST TLS	AIRBUS TEST HAM→
NEW SCAN SELECT	EMPTY SCAN ACTIVATE*
<RETURN	SCAN SEL PRINT*

EXAMPLE		
	[5L]: NEW SCAN SELECT : ACTIVE SEL DISPLAY :	 Selects the scan mask. Displays the scan mask used by ATSU.
	[6L] RETURN	When selected, the MCDU displays the COMM CONFIG page.
	[1R] OLD ARINC EUROPE	Selects the OLD ARINC Europe (datalink service provider).
	[2R] ARINC AFRICA	Selects the ARINC Africa (datalink service provider).
	[3R] JACARS AUSTRAL	Selects the JACARS Australia (datalink service provider).
	[5R] EMPTY SCAN ACTIVATE	Activates an emprty scan mask, in order to inhibit VHF datalink communication.
	[6R] SCAN SEL PRINT	When selected, the printer prints information.

WHEN CAN WE EXPECT

Ident.: DSC-46-10-40-30-00021085.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

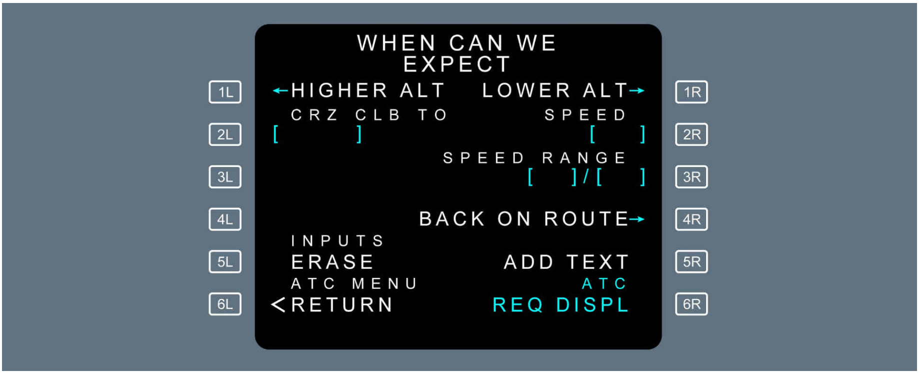


```
        WHEN CAN WE
          EXPECT
←HIGHER ALT     LOWER ALT→
 CRZ CLB TO          SPEED
[        ]          [    ]
           SPEED RANGE
              [   ]/[    ]

            BACK ON ROUTE→
 ALL FIELDS
 ERASE            ADD TEXT
 ATC MENU              ATC
<RETURN          REQ DISPL
```

[1L] HIGHER ALT	Prepares a negotiation request, in order to climb to a higher altitude. If a lower altitude was selected, setting a higher altitude deselects the lower altitude.
[2L] CRZ CLB TO	Prepares a negotiation request, in order to climb to a higher altitude.
[5L] ALL FIELDS ERASE	Erases all data that were entered on the page, and erases the data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] LOWER ALT	Prepares a negotiation request, in order to descend to a lower altitude. If a higher altitude was selected, setting a lower altitude deselects the higher altitude.
[2R] SPEED	Prepares a negotiation request of new speed clearance.
[3R] SPEED RANGE	Prepares a negotiation request, in order to operate within a speed range.
[4R] BACK ON ROUTE	Prepares a negotiation request, in order to return to the initial route.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

WHEN CAN WE EXPECT

Ident.: DSC-46-10-40-30-00021085.0001001 / 21 MAR 17
Applicable to: LV-GKO, LV-GKP



WHEN CAN WE
EXPECT
←HIGHER ALT LOWER ALT→
CRZ CLB TO SPEED
[ ] [ ]
SPEED RANGE
[ ]/[ ]
BACK ON ROUTE→
INPUTS
ERASE ADD TEXT
ATC MENU ATC
<RETURN REQ DISPL

[1L] HIGHER ALT	Prepares a negotiation request, in order to climb to a higher altitude. If a lower altitude was selected, setting a higher altitude deselects the lower altitude.
[2L] CRZ CLB TO	Prepares a negotiation request, in order to climb to a higher altitude.
[5L] INPUTS ERASE	Erases all data that were entered on the page, and erases the data that were entered on other associated pages.
[6L] ATC MENU RETURN	When selected, the MCDU displays the ATC MENU page.
[1R] LOWER ALT	Prepares a negotiation request, in order to descend to a lower altitude. If a higher altitude was selected, setting a lower altitude deselects the higher altitude.
[2R] SPEED	Prepares a negotiation request of new speed clearance.
[3R] SPEED RANGE	Prepares a negotiation request, in order to operate within a speed range.
[4R] BACK ON ROUTE	Prepares a negotiation request, in order to return to the initial route.
[5R] ADD TEXT	When selected, the MCDU displays the TEXT page. ADD TEXT is active, while a message is being created.
[6R] ATC REQ DISPL	When selected, the DCDU displays prepared message.

MCDU Scratchpad Messages

MCDU SCRATCHPAD MESSAGES

Ident.: DSC-46-10-40-40-10-00021151.0001001 / 21 MAR 17
Applicable to: ALL

MESSAGE	CONDITIONS
ALREADY SELECTED	The selectable key was selected.
BOTH ENTRY OUT OF RANGE or TWO ENTRY OUT OF RANGE	The double value that was entered is out of range.
ENTRY OUT OF RANGE	The single value that was entered is out of range.
FORMAT: _ _ _	The acquisition format is not valid. An example of the required format is displayed (FORMAT: NNN, FORMAT: XXXX, etc), where: - N : Numerical data (0 to 9) - X : Alphanumerical data (0 to 9, or A to Z). To display the required format of specific data on the scratchpad message field, press on the corresponding empty field. This serves as a reference to the flight crew.
LAST MSG ELEMENT	The maximum number of message elements, for a given downlink message, was reached.
NOT ALLOWED	Data entry is not allowed, or press on the selected key.
TOO MANY MSG ELEMENTS	It is not allowed to enter a new parameter, because the maximum number of message elements was reached.

Ident.: DSC-46-10-40-40-10-00021152.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MESSAGE	CONDITIONS
A/C REGISTER NBR UNAVAIL	Notification is not available, because the Tail Number is unavailable.
A/C POS UNAVAILABLE	Notification is not available, because the Aircraft Position is unavailable.
ADS-C FUNCTION OFF or ADS FUNCTION OFF	The ADS-C DETAIL key/ADS DETAIL key was selected, but the page cannot currently be accessed, because the ADS-C is OFF, and consequently no ADS-C connections can be established.
CLR NOT ALLOWED	An available key has been selected, but the function is not available due to CLR still displayed on the scratchpad field.
COM UNAVAILABLE	The selected command is not available, because datalink communications means are currently unavailable.

Continued on the following page

Continued from the previous page

MESSAGE	CONDITIONS
DCDU FILE FULL	The selected command is not available, because the DCDU file is full.
ENTER MANDATORY FIELDS	Selection of a command is not available, because mandatory fields are not filled in.
FLIGHT NBR UNAVAILABLE	Notification is not available, because the flight number is unavailable.
KEY NOT ACTIVE	It is not allowed to press this key.
LAT/LON DISPL ABREVIATED	The LAT/LONG display is abbreviated only on the MCDU display field, because there is lack of space.
MSG ALREADY DISPLAYED	The ATC DISPL command is not available, because the message is already displayed on the DCDU.
MSG RECORD IS EMPTY	The MSG RECORD ERASE command is not available, because there are no messages recorded.
MSG RECORD NOT RELIABLE	Due to a technical problem, the list of messages recorded is not reliable. All CPDLC messages are deleted and new messages should not be recorded.
NO ACTIVE ATC	The ATC DISPL or the MAX UPLINK DELAY keys were selected, but the function is currently unavailable because there is no active CPDLC connection.
NO ADS-C CONNECTION or NO ADS CONNECTION	The ADS-C DETAIL key/ADS DETAIL key was selected, but the page cannot currently be accessed, because the ADS-C is ARMED but no connection is currently established.
NO DCDU MSG TO MODIFY	The MSG MODIFY key was selected, but the function is currently unavailable.
NO FM DATA	No FMS data are available when selecting the MODIFY key for a position report.
NO INPUTS	The ALL FIELDS ERASE command is not available, because there are no items to erase.
NO MSG TO PRINT	The PRINT key was selected, but the function is currently unavailable because there is no message to be printed.
NO WHOLE MSG PREPARED	Selection of the ATC DISPL or ADD TEXT command is not available, because the message is not completely prepared.
NON MODIFIABLE FIELD	A non-modifiable field was selected.
OUT OF RANGE	A single value of double data is out of range.
PRINT FAILED	Print fails after selection of the PRINT function.
PRINTER UNAVAILABLE	The PRINT key was selected, but the printer is currently unavailable.

Ident.: DSC-46-10-40-40-10-00021153.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MESSAGE	CONDITIONS
ARPT/TYPE ALREADY USED	The same ART/TYPE have been introduced in at least two different fields of the ATIS MENU page.
CANCEL UPDATE BEFORE	The ARPT/TYPE left field cannot be modified because the automatic update function is still activated.
ENTER ARPT/TYPE FIELD	The SEND key has been selected, but the function is not available because the ARPT/TYPE field is empty.
GO TO ATIS MENU TO SEND	The AUTO UPDATE function has been armed on the ATIS AUTO UPDATE page. This scratchpad message is displayed to remind the crew that the request for automatic update of new ATIS reports has to be sent to the ground via the ATIS MENU page.
NEW ATIS: READ AGAIN	A new ATIS report has been received. This ATIS report replaces the ATIS report that was displayed. Therefore, the crew has to read the new ATIS report.
NEW MSG: READ AGAIN	An FSM (Flight System Message) has been received. The flight crew has to read this FSM.
NO ATIS REPORT RECEIVED	The ARPT/TYPE left key has been selected, but the function is not available because there are currently no ATIS reports.
NO PREVIOUS ATIS STORED	The PREV ATIS key is not available, because there is no previous ATIS report.
UPDATE IN PROGRESS	The ATIS AUTO UPDATE key associated to a specific ARPT/TYPE field has been selected, but the function is currently unavailable because updating is in progress.
WAITING: ATIS IN USE	The ARPT/TYPE left field cannot be modified because the ATIS report page is in use on the other MCDU.
WAITING: IN PROGRESS	The SEND key has been selected, but the function is not available because it is in progress.

Ident.: DSC-46-10-40-40-10-00021155.0002001 / 21 MAR 17
Applicable to: ALL

SCRATCHPAD MESSAGES ON THE COMM MENU PAGE

MESSAGE	CONDITIONS
COMMAND NOT AVAIL	The command is unavailable.
DEFAULT VHF SP LIST (1)	The new SCAN MASK is unavailable. The system displays the default SCAN MASK instead.
ENTER A/C ICAO CODE	The aircraft ICAO code is not valid. To enter the A/C ICAO code, *Refer to DSC-46-10-50 How to Initialize*

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MESSAGE	CONDITIONS
ENTER A/C REGISTR **or** **ENTER A/C REGISTER**	The aircraft registration number is not valid. To enter this parameter, *Refer to DSC-46-10-50 How to Initialize*
ENTER A/L ID	The airline identification number is not valid. To enter this parameter, *Refer to DSC-46-10-50 How to Initialize*
ENTER VHF3 SCAN MASK *(1)* **or** **ENTER VHF3 SCAN SELECT** *(1)*	No service provider has been selected.
FORMAT ERROR	The message was entered in an inappropriate format.
NOT ALLOWED	It is not allowed to press this key.
PRINT FAILED	A print command was unsuccessful.
PRT MSG PRINT FAIL	Automatic print of an AOC uplink message was unsuccessful.
SYSTEM BUSY - TRY LATER	The system is busy. The command, selected by the crew, cannot currently be performed.
VHF3 CAN BE SET IN VOICE	VHF 3 datalink communications are lost. However, VHF 3 can be used in voice mode.
VHF3 SWITCH IMPOSSIBLE	It is not possible to switch from VHF 3 voice mode to VHF 3 data mode.

(1) *Depending on airline customization, access to the SCAN SELECT menu may not be possible. If it is not, the DEFAULT VHF SP LIST and ENTER VHF3 SCAN SELECT scratchpad messages are not applicable.*

MCDU Data Entry Format

MCDU DATA ENTRY FORMAT

Ident.: DSC-46-10-40-50-10-00021154.0002001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
A/C ICAO CODE	XXXXXXXX	8 characters		COMM CONFIG
A/C REGISTR	XXXXXXX	7 characters		COMM CONFIG
ACARS A/L ID	AA	2 letters		COMM CONFIG
ALT	FLNNN or NNN Leading zeros on NNN may be omitted	30-410	Hundreds of feet (MSL)	ATC VERT REQ POSITION REPORT
	NNNNNFT or NNNNN Between 0 and 1 000 ft, “FT” must be written. Leading zeros may be omitted.	0-25 000	Feet	
	NNNNNM Leading zeros may be omitted	0-12 500	Meters	
ASSIGNED ALT	Same as ALT			MESSAGE MODIFY
ASSIGNED SPD	Same as SPD			MESSAGE MODIFY
AT	Same as UTC			MESSAGE MODIFY
ATC CENTER	AAAA	4 letters		NOTIFICATION
BLOCK ALT	Same as ALT/ Same as ALT			ATC VERT REQ
CAN AT	Same as DIR TO			MESSAGE MODIFY
	Same as UTC			
CLB TO /START AT	Same as ALT/ Same as START AT. START AT may be optional. START AT may be modified independently if preceded by “/ ”.			ATC VERT REQ
CLBING TO	Same as ALT			EMERGENCY POSITION REPORT
CLIMBING TO	Same as ALT			MESSAGE MODIFY
CRZ CLB TO	Same as ALT			ATC VERT REQ WHEN CAN WE EXPECT
DES TO/START AT	Same as ALT/ Same as START AT			ATC VERT REQ

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
DESCENDING TO	Same as ALT			EMERGENCY MESSAGE MODIFY
DEVIATING	Same as OFFSETTING			POSITION REPORT MESSAGE MODIFY
DIR TO	XXXXX (Fixname)	MIN 1 alphanumeric Max 5 alphanumeric		ATC LAT REQ
	DDMM.MB/EEEMM.MC (LAT/long) "DD" = lat degrees "EEE" = long degrees "MM.M" = lat and long minutes Leading zeros may be omitted	DD : 0-90 B : N or S MM.M : 0-59.9 EEE = 0- 180 C : E or W	Degrees Minutes Degrees	
DISTANCE	NNN.NNM or NNN.N Leading zeros may be omitted	0-999.9	NM	MESSAGE MODIFY
	NNNNKM "KM" must be written. Leading zeros may be omitted	1-1 024	KM	
DIVERTING/VIA	XXXXX/XXXXX If left (right) field is filled in, right (left) field must also be filled in. VIA may be modified independently if preceded by " / ".	For each XXXXX : MIN 1 alphanumeric Max 5 alphanumeric		EMERGENCY
DESCENDING TO	Same as ALT			POSITION REPORT
ENDURANCE	HHMM "HH" = NN or NNH "MM" = NN or NNMIN "MIN" = "MIN", "MN" or "M"	HH : 0-23 MM : 0-59	Hours Minutes	EMERGENCY POSITION REPORT
ENSUING WPT	Same as DIR TO			MESSAGE MODIFY
ETA	Same as UTC			POSITION REPORT
FREE TEXT	Any character which belongs to : (A ... Z), (0 ... 9), ( ), (/), (+), (-), (.)	Max 96 characters		TEXT MORE FREE TEXT

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
FREQ	NNNNN Leading zeros may be omitted	2 850–28 000	HF : kHz	ATC OTHER REQ EMERGENCY
	NNNNNNNNNNNN SATCHANNEL: corresponds to a 12 digits telephone number	12 numbers		
	NNN.NNN	225-399.975	UHF : MHz	
	NNN.NNN	117-138	VHF : MHz	
FROM	Same as DIR TO			MESSAGE MODIFY
GROUND SPD	NNNKT or NNN Leading zeros on NNN may be omitted	70-700	Kt	POSITION REPORT
GROUND TRK	Same as HEADING			ATC LAT REQ
HEADING	NNN Leading zeros may be omitted	1-360 360 is displayed as 0	Magnetic degrees	ATC LAT REQ POSITION REPORT
	NNNT	1-360 360T is displayed as 0T	True degrees	
ICING	X	T, L, M or S T : Trace, L : Light, M : Moderate S : Severe		POSITION REPORT
LEAVING	Same as ALT			MESSAGE MODIFY
LEVEL	Same as ALT			MESSAGE MODIFY
MAX UPLINK DELAY	NNN or NNNS	5-999	Seconds	CONNECTION STATUS
NEXT	Same as DIR TO			POSITION REPORT
NEXT WPT	Same as DIR TO			MESSAGE MODIFY
NEXT WPT ETA	Same as UTC			MESSAGE MODIFY
OFFSET/ START AT	Same as OFFSETTING/ Same as START AT. START AT may be optional. START AT may be modified independently if preceded by “/ ”.			ATC LAT REQ

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
OFFSETTING	DNNNNM or NNNNMD "D" = offsetting direction "NM" must be omitted Leading zeros on NNN may be omitted	D : L (Left) or R (Right) NNN : 1-128	NM	EMERGENCY
	DNNNKM or NNNKMD "D" = offsetting direction "KM" must be written. Leading zeros on NNN may be omitted	D : L (Left) or R (Right) NNN : 1-256	KM	
OVHD	Same as DIR TO			POSITION REPORT
PASSING	Same as DIR TO			MESSAGE MODIFY
PPOS	Same as DIR TO			POSITION REPORT
PRESENT ALT	Same as ALT			MESSAGE MODIFY
PRESENT HEADING	Same as HEADING			MESSAGE MODIFY
PRESENT GRND TRK	Same as HEADING			MESSAGE MODIFY
PRESENT POS	Same as DIR TO			MESSAGE MODIFY
PRESENT SPD	Same as SPD			MESSAGE MODIFY
REACHING ALT	Same as ALT			MESSAGE MODIFY
REACHING BLOCK	Same as ALT/ Same as ALT			MESSAGE MODIFY
REMAINING FUEL	Same as ENDURANCE			MESSAGE MODIFY
REPORTED ETA	Same as UTC			MESSAGE MODIFY
REPORTED WPT	Same as DIR TO			MESSAGE MODIFY
SAT	±NN or ±NNC "-" may be entered as "M". If no sign is input, "+" is taken by default	-80 to +47	Degrees Celsius	POSITION REPORT
	+NNNF "F" must be written. "-" may be entered as "M". If no sign is input, "+" is taken by default	-105 to +150	Degrees Fahrenheit	
SID	XXXXXX	MIN 1 alphanumeric Max 6 alphanumeric		ATC LAT REQ
SOULS	NNNN Leading zeros may be omitted	1-1024		EMERGENCY MESSAGE MODIFY

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
SPD	NNN or NNNKT Leading zeros may be omitted	70-350	Kt	ATC VERT REQ
	M.NN or .NN The decimal point must be written, trailing zeros may be omitted	0.61-0.92	Mach	
SPD RANGE	Same as SPD/ Same as SPD			ATC VERT REQ
SPEED	Same as SPD			WHEN CAN WE EXPECT POSITION REPORT
SPEED RANGE	Same as SPD/ Same as SPD			WHEN CAN WE EXPECT
SQUAWKING	NNNN	N : 0-7		MESSAGE MODIFY
STANDARD A/L ID	AAA			COMM CONFIG
START AT	XXXXX (Fixname)	MIN 1 alphanumeric Max 5 alphanumeric		ATC LAT REQ ATC VERT REQ
	DDMM.MB/EEEMM.MC (lat/long) ”DD” = lat degrees ”EEE” = long degrees ”MM.M” = lat and long minutes Leading zeros may be omitted	DD : 0-90 B : N or S MM.M : 0-59.9 EEE : 0-180 C : E or W	Degrees Minutes Degrees	
	HHMM ”HH” = NN or NNH ”MM” = NN or NNMIN ”MIN” = “MIN”, “MN” or ”M” or “Z”	HH : 0-23 MM : : 0-59	Hours Minutes	
TO	Same as DIR TO			POSITION REPORT MESSAGE MODIFY
TRACK ANGLE	Same as HEADING			POSITION REPORT
TURB	X	L, M or S L : Light M : Moderate S : Severe		POSITION REPORT

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
UTC	"HHMM" "HH" = NN or NNH "MM" = NN or NNMIN "MIN" = "MIN" or "MN" or "M" or "Z"	HH : 0-23 MM : 0-59	Hours Minutes	POSITION REPORT
VERT SPEED	±NNNN FT/MIN "-" may be entered as "M". If no sign is input, "+" is taken by default. "FT/MIN" = "FT/MIN", "FT" or "FTM"	0-6 000	Feet/ minutes	POSITION REPORT
	±NNNNM/MIN "-" may be entered as "M". If no sign is input, "+" is taken by default. "M/MIN" = "M/MIN", "M" or "MM"	0-2000	Meters/ minutes	
WHEN CAN SPD	Same as SPD			ATC VERT REQ
WIND	D/NNNKT or D/NNN Leading zeros on NNN may be omitted	D : 1-360 NNN : 0-255	Degrees Kt	POSITION REPORT
	D/NNNKM Leading zeros on NNN may be omitted	D : 1-360 NNN : 0-511	Degrees Km/h	
WX DEV UP TO	Same as OFFSETTING. In this case, direction D (L or R) can be omitted. This means a weather deviation in either direction.			ATC LAT REQ

Ident.: DSC-46-10-40-50-10-00021154.0001001 / 10 MAY 22
Applicable to: LV-GKO, LV-GKP

DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
A/C ICAO CODE	XXXXXXXX	8 characters		COMM CONFIG
A/C REGISTR	XXXXXXX	7 characters		COMM CONFIG
ACARS A/L ID	AA	2 letters		COMM CONFIG

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
ALT	FLNNN or NNN Leading zeros on NNN may be omitted	30-410	Hundreds of feet (MSL)	ATC VERT REQ POSITION REPORT
	NNNNNFT or NNNNN Between 0 and 1 000 ft, "FT" must be written. Leading zeros may be omitted.	0-25 000	Feet	
	NNNNNM Leading zeros may be omitted	0-12 500	Meters	
ASSIGNED ALT	Same as ALT			MESSAGE MODIFY
ASSIGNED SPD	Same as SPD			MESSAGE MODIFY
AT	Same as UTC			MESSAGE MODIFY
ATC CENTER	AAAA	4 letters		NOTIFICATION
BLOCK ALT	Same as ALT/ Same as ALT			ATC VERT REQ
CAN AT	Same as DIR TO			MESSAGE MODIFY
	Same as UTC			
CLB TO/START AT	Same as ALT/ Same as START AT. START AT may be optional. START AT may be modified independently if preceded by "/ ".			ATC VERT REQ
CLBING TO	Same as ALT			EMERGENCY POSITION REPORT
CLIMBING TO	Same as ALT			MESSAGE MODIFY
CRZ CLB TO	Same as ALT			ATC VERT REQ WHEN CAN WE EXPECT
DES TO/START AT	Same as ALT/ Same as START AT			ATC VERT REQ
DESCENDING TO	Same as ALT			EMERGENCY MESSAGE MODIFY
DEVIATING	Same as OFFSETTING			POSITION REPORT MESSAGE MODIFY

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
DIR TO	XXXXX (Fixname)	Min 1 alphanumeric Max 5 alphanumeric		ATC LAT REQ
	DDMM.MB/EEEMM.M C (lat/long) "DD" = lat degrees "EEE" = long degrees "MM.M" = lat and long minutes Leading zeros may be omitted	D : 0-90 B : N or S MM.M : 0-59.9 EEE : 0- 180 C : E or W	Degrees Minutes Degrees	
DISTANCE	NNN.NNM or NNN.N Leading zeros may be omitted	0-999.9	NM	MESSAGE MODIFY
	NNNNKM "KM" must be written. Leading zeros may be omitted	1-1 024	KM	
DIVERTING/VIA	XXXXX/XXXXX If left (right) field is filled in, right (left) field must also be filled in. VIA may be modified independently if preceded by " / ".	For each XXXXX : Min 1 alphanumeric Max 5 alphanumeric		EMERGENCY
DESCENDING TO	Same as ALT			POSITION REPORT
ENDURANCE	HHMM "HH" = NN or NNH "MM" = NN or NNMIN "MIN" = "MIN", "MN" or "M"	HH : 0-23 MM : 0-59	Hours Minutes	EMERGENCY POSITION REPORT
ENSUING WPT	Same as DIR TO			MESSAGE MODIFY
ETA	Same as UTC			POSITION REPORT
FREE TEXT	Any character which belongs to: (A ... Z), (0 ... 9), ( ), (/), (+), (-), (.)	Max 96 characters		TEXT MORE FREE TEXT

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
FREQ	NNNNN Leading zeros may be omitted	2 850–28 000	HF : kHz	ATC OTHER REQ EMERGENCY
	NNNNNNNNNNNN SATCHANNEL: corresponds to a 12 digits telephone number	12 numbers		
	NNN.NNN	225-399.975	UHF : MHz	
	NNN.NNN	117-138	VHF : MHz	
FROM	Same as DIR TO			MESSAGE MODIFY
GROUND SPD	NNNKT or NNN Leading zeros on NNN may be omitted	70-700	Kt	POSITION REPORT
GROUND TRK	Same as HEADING			ATC LAT REQ
HEADING	NNN Leading zeros may be omitted	1-360 360 is displayed as 0	Magnetic degrees	ATC LAT REQ POSITION REPORT
	NNNT	1-360 360T is displayed as 0T	True degrees	
ICING	X	T, L, M or S T : Trace, L : Light, M : Moderate, S : Severe		POSITION REPORT
LEAVING	Same as ALT			MESSAGE MODIFY
LEVEL	Same as ALT			MESSAGE MODIFY
NEXT	Same as DIR TO			POSITION REPORT
NEXT WPT	Same as DIR TO			MESSAGE MODIFY
NEXT WPT ETA	Same as UTC			MESSAGE MODIFY
OFFSET/ START AT	Same as OFFSETTING/ Same as START AT. START AT may be optional. START AT may be modified independently if preceded by “/ ”.			ATC LAT REQ

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
OFFSETTING	DNNNNM or NNNNMD "D" = offsetting direction "NM" must be omitted Leading zeros on NNN may be omitted	D: L (Left) or R (Right) NNN: 1-128	NM	EMERGENCY
	DNNNKM or NNNKMD "D" = offsetting direction "KM" must be written. Leading zeros on NNN may be omitted	D: L (Left) or R (Right) NNN: 1-256	KM	
OVHD	Same as DIR TO			POSITION REPORT
PASSING	Same as DIR TO			MESSAGE MODIFY
PPOS	Same as DIR TO			POSITION REPORT
PRESENT ALT	Same as ALT			MESSAGE MODIFY
PRESENT HEADING	Same as HEADING			MESSAGE MODIFY
PRESENT GRND TRK	Same as HEADING			MESSAGE MODIFY
PRESENT POS	Same as DIR TO			MESSAGE MODIFY
PRESENT SPD	Same as SPD			MESSAGE MODIFY
REACHING ALT	Same as ALT			MESSAGE MODIFY
REACHING BLOCK	Same as ALT/ Same as ALT			MESSAGE MODIFY
REMAINING FUEL	Same as ENDURANCE			MESSAGE MODIFY
REPORTED ETA	Same as UTC			MESSAGE MODIFY
REPORTED WPT	Same as DIR TO			MESSAGE MODIFY
SAT	±NN or ±NNC "-" may be entered as "M". If no sign is input, "+" is taken by default	-80 to +47	Degrees Celsius	POSITION REPORT
	+NNNF "F" must be written. "-" may be entered as "M". If no sign is input, "+" is taken by default	-105 to +150	Degrees Fahrenheit	
SID	XXXXXX	Min 1 alphanumeric Max 6 alphanumeric		ATC LAT REQ
SOULS	NNNN Leading zeros may be omitted	1-1024		EMERGENCY MESSAGE MODIFY

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
SPD	NNN or NNNKT Leading zeros may be omitted	70-350	Kt	ATC VERT REQ
	M.NN or .NN The decimal point must be written, trailing zeros may be omitted	0.61-0.92	Mach	
SPD RANGE	Same as SPD/ Same as SPD			ATC VERT REQ
SPEED	Same as SPD			WHEN CAN WE EXPECT POSITION REPORT
SPEED RANGE	Same as SPD/ Same as SPD			WHEN CAN WE EXPECT
SQUAWKING	NNNN	N 0-7		MESSAGE MODIFY
STANDARD A/L ID	AAA			COMM CONFIG
START AT	XXXXX (Fixname)	Min 1 alphanumeric Max 5 alphanumeric		ATC LAT REQ ATC VERT REQ
	DDMM.MB/EEEMM.MC (lat/long) "DD" = lat degrees "EEE" = long degrees "MM.M" = lat and long minutes Leading zeros may be omitted	DD : 0-90 B : N or S MM.M 0-59.9 EEE : 0-180 C : E or W	Degrees Minutes Degrees	
	HHMM "HH" = NN or NNH "MM" = NN or NNMIN "MIN" = = "MIN", "MN" or "M" or "Z"	HH = 0-23 MM : 0-59	Hours Minutes	
TO	Same as DIR TO			POSITION REPORT MESSAGE MODIFY
TRACK ANGLE	Same as HEADING			POSITION REPORT
TURB	X	L, M or S L : Light M : Moderate S : Severe		POSITION REPORT

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DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
UTC	"HHMM" "HH" = NN or NNH "MM" = NN or NNMIN "MIN" = "MIN" or "MN" or "M" or "Z"	HH : 0-23 MM : 0-59	Hours Minutes	POSITION REPORT
VERT SPEED	±NNNN FT/MIN "-" may be entered as "M". If no sign is input, "+" is taken by default. "FT/MIN" : "FT/MIN", "FT" or "FTM"	0-6 000	Feet/ minutes	POSITION REPORT
	±NNNNM/MIN "-" may be entered as "M". If no sign is input, "+" is taken by default. "M/MIN" : "M/MIN", "M" or "MM"	0-2000	Meters/ minutes	
WHEN CAN SPD	Same as SPD			ATC VERT REQ
WIND	D/NNNKT or D/NNN Leading zeros on NNN may be omitted	D : 1-360 NNN : 0-255	Degrees Kt	POSITION REPORT
	D/NNNKM Leading zeros on NNN may be omitted	D : 1-360 NNN : 0-511	Degrees Km/h	
WX DEV UP TO	Same as OFFSETTING. In this case, direction D (L or R) can be omitted. This means a weather deviation in either direction.			ATC LAT REQ

Ident.: DSC-46-10-40-50-10-00021156.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DATA NAME	FORMAT	RANGE	UNIT	DISPLAY PAGE
A/C TYPE	XXXX	Min 2 alphanumeric Max 4 alphanumeric		DEPART REQ
ARPT/TYPE	XXXX/ARR ”ARR” = “ARR”, “AR”, or “A”. If left (right) field is filled in, right (left) field must also be filled in.		Arrival airport	ATIS MENU
	XXXX/DEP ”DEP” = “DEP”, “DDE” or “D”. If left (right) field is filled in, right (left) field must also be filled in.		Departure airport	
AT TIME	”HH” = NN or NNH. ”MM” = NN or NNMIN. ”MIN” = “M”, “MN” or “Z” HHMM	HH 0-23 MM 0-59	HH : Hours MM : Minutes	OCEANIC REQ
ATIS	Same as ATIS CODE			MESSAGE MOFIDFY
ATIS CODE	A	1 letter		DEPART REQ
DIR TO	XXXXX (Fixname)	Min 1 alphanumeric Max 5 alphanumeric		ATC LAT REQ
	DDMM.MB/EEEMM.MC (lat/long) ”DD” = lat degrees ”EEE” = long degrees ”MM.M” = lat and long minutes Leading zeros may be omitted	DD : 0-90 B : N or S MM.M : 0-59.9 EEE : 0-180 C : E or W	Degrees Minutes Degrees	
ENTRY-POINT	Same as DIR TO			OCEANIC REQ
FREE TEXT	Any character which belongs to : (A ... Z), (0 ... 9), ( ), (/), (+), (-), (.)	Max 96 characters		DEPART REQ OCEANIC REQ MORE FREE TEXT
FROM/TO	XXXX/XXXX Both fields may be entered independently	4 characters mandatory for each XXXX		DEPART REQ
GATE	XXXXX	Min 1 alphanumeric Max 5 aplhanumeric		DEPART REQ
REQ FL	NNN or FLNNN Leading zeros on NNN may be omitted	30-410	Hundreds of feet (MSL)	OCEANIC REQ
REQ MACH	M.NN or .NN The decimal point must be written, trailing zeros may be omitted.	0.61-0.92	Mach	OCEANIC REQ

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ECAM

MEMO DISPLAY

Applicable to: ALL

Ident.: DSC-46-10-40-60-A-00017111.0001001 / 21 MAR 16

COMPANY ALERT : This memo appears in green when the aircraft receives an uplink alert message, or when an AOC special condition requires a pilot action on the MCDU (depends on AOC programming). This memo pulses green for 180 s, then remains steady. It is associated with a buzzer for 1 s.

Ident.: DSC-46-10-40-60-A-00017213.0001001 / 21 MAR 16

COMPANY DATALINK STBY : This memo appears in green when the AOC datalink air-ground communication is temporarily unavailable, but not lost.

Ident.: DSC-46-10-40-60-A-00017212.0001001 / 21 MAR 16

DATALINK STBY : This memo appears in green when the datalink air-ground communication is temporarily lost.

Ident.: DSC-46-10-40-60-A-00017211.0001001 / 21 MAR 16

ATC DATALINK STBY : This memo appears in green when the ATC datalink air-ground communication is temporarily unavailable, but not lost.

Ident.: DSC-46-10-40-60-A-00017112.0001001 / 21 MAR 16

COMPANY CALL : This memo appears in green when the aircraft receives a message from the ground requesting voice communication on VHF.

Ident.: DSC-46-10-40-60-A-00017114.0001001 / 21 MAR 16

COMPANY MSG : This memo appears in green when the aircraft receives a message from the ground.

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INTRODUCTION

Ident.: DSC-46-10-50-00021046.0002001 / 21 MAR 17
Applicable to: ALL

How To chapter contains examples of:
- How to activate the datalink connection
- How to receive a datalink message
- How to create a datalink message
- How to send a datalink message.

Illustrations in How To are generic and do not reflect differences depending on the datalink standard installed in the aircraft.

HOW TO INITIALIZE

Ident.: DSC-46-10-50-00021047.0001001 / 31 AUG 17
Applicable to: ALL

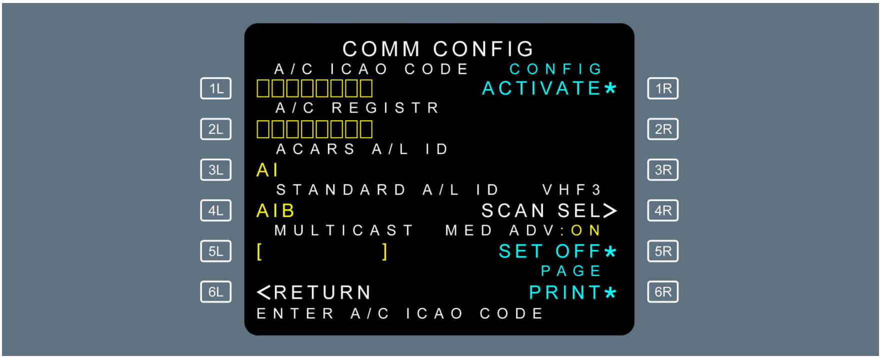
Datalink may be initialized:
- Automatically
  Datalink initializes automatically, provided that a list of service providers is scanned, and all required parameters are received, and validated by the ATSU.
- Manually
  Datalink may be initialized manually, when the system is not correctly initialized automatically.

The VHF3 SCAN SELECT page of the MCDU displays the list of service providers.
The COMM COMFIG page, on the MCDU displays required parameters.

MANUAL INITIALIZATION

If one of required parameters is not valid, one or more manual entries may be required:

● **If the A/C ICAO CODE is not valid:**
The MCDU scratchpad displays ENTER A/C ICAO CODE:



```
             COMM CONFIG
  A/C ICAO CODE         CONFIG
□□□□□□□□□            ACTIVATE*
  A/C REGISTR
□□□□□□□□□
  ACARS A/L ID
AI
  STANDARD A/L ID         VHF3
AIB                    SCAN SEL>
  MULTICAST        MED ADV:ON
[          ]           SET OFF*
                           PAGE
<RETURN                   PRINT*
ENTER A/C ICAO CODE
```

The flight crew clears the scratchpad, and inserts the A/C ICAO code (in hexal encoding) via the MCDU scratchpad.

A/C ICAO CODE..INSERT

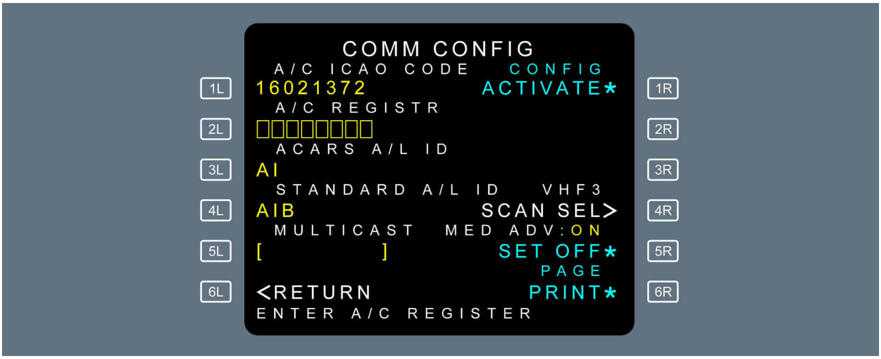
The flight crew inserts A/C ICAO code via the MCDU scratchpad into A/C ICAO CODE.

CONFIG ACTIVATE...SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C ICAO code.

- **<u>If ARN is not valid</u>:**

  The MCDU scratchpad displays ENTER A/C REGISTER:



```
             COMM CONFIG
  A/C ICAO CODE         CONFIG
16021372             ACTIVATE*
  A/C REGISTR
□□□□□□□□□
  ACARS A/L ID
AI
  STANDARD A/L ID         VHF3
AIB                    SCAN SEL>
  MULTICAST        MED ADV:ON
[          ]           SET OFF*
                           PAGE
<RETURN                   PRINT*
ENTER A/C REGISTER
```

The flight crew clears the scratchpad, and inserts the A/C registration via the MCDU scratchpad.

A/C REGISTR..INSERT

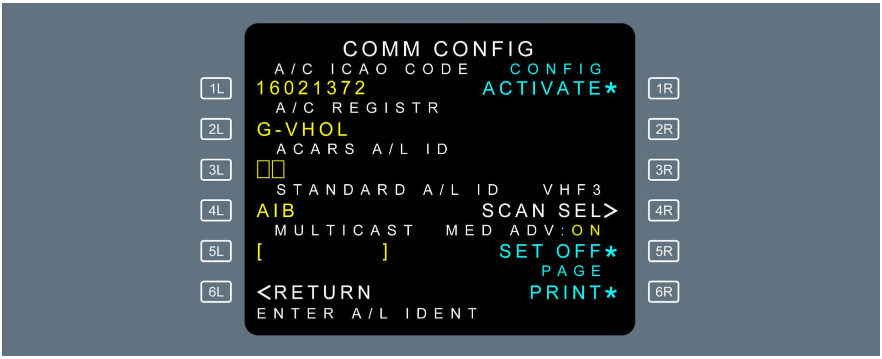
The flight crew inserts A/C ICAO registration via the MCDU scratchpad to A/C REGISTR.

CONFIG ACTIVATE...SELECT

The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C registration.

- **<u>If the A/L ID is not valid</u>:**

  The MCDU scratchpad displays ENTER A/L IDENT:



```
        COMM CONFIG
 A/C ICAO CODE        CONFIG
16021372           ACTIVATE*
 A/C REGISTR
G-VHOL
 ACARS A/L ID
□□
 STANDARD A/L ID       VHF3
AIB                SCAN SEL>
 MULTICAST      MED ADV:ON
[            ]      SET OFF*
                        PAGE
<RETURN               PRINT*
ENTER A/L IDENT
```

The flight crew clears the scratchpad, and inserts the two-letter A/L ID code via the MCDU scratchpad.

A/L ID...INSERT

The flight crew inserts A/L ID code via the MCDU scratchpad to A/L ID.

CONFIG ACTIVATE...SELECT

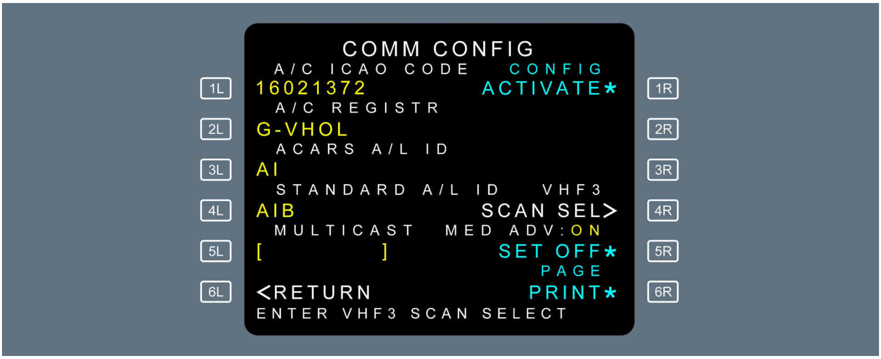
The flight crew selects 1R/CONFIG ACTIVATE to activate manual entry of the A/C registration.

- **<u>If VHF Service Provider is not selected</u>**

  and

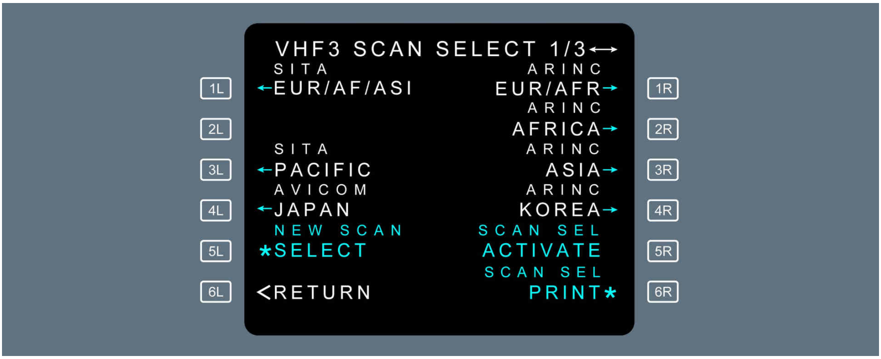
  <u>if the VHF3 SCAN/MASK SELECT menu can be accessed</u>:

  The MCDU scratchpad displays ENTER VHF3 SCAN SELECT:



```
       COMM CONFIG
 A/C ICAO CODE    CONFIG
16021372       ACTIVATE*
 A/C REGISTR
G-VHOL
 ACARS A/L ID
AI
 STANDARD A/L ID     VHF3
AIB              SCAN SEL>
 MULTICAST    MED ADV:ON
[       ]         SET OFF*
                      PAGE
<RETURN             PRINT*
ENTER VHF3 SCAN SELECT
```

On the VHF3 SCAN SELECT page, select service providers, in the airline priority order, and activate the VHF SCAN SELECT function.



```
  VHF3 SCAN SELECT 1/3←→
 SITA               ARINC
←EUR/AF/ASI      EUR/AFR→
                    ARINC
                  AFRICA→
 SITA               ARINC
←PACIFIC            ASIA→
 AVICOM             ARINC
←JAPAN             KOREA→
 NEW SCAN        SCAN SEL
*SELECT          ACTIVATE
                 SCAN SEL
<RETURN            PRINT*
```

EXAMPLE OF SELECTION OF DATALINK SERVICE PROVIDERS:

Selection of SITA 725 and ARINC service providers :

1. Press 5L key: The asterisk next to SELECT indication disappears, then reappears.
2. Press 1L key to select SITA 725: SELECT indication goes off, and the priority number of selection # 1 appears.
3. Press 1R key to select ARINC: SELECT indication goes off, and the priority number of selection # 2 appears.
4. Press 5R key to activate the VHF SCAN SELECT function: The asterisk next to SCAN SELECT ACTIVATE indication disappears, then reappears.

Note: *Modification of the SCAN SELECT setting may result in the loss of air-ground VHF datalink communication, and the increase of datalink service provider charges. Therefore, the SCAN SELECT setting should not be modified by the flight crew, unless the flight crew is instructed to do so.*

HOW TO NOTIFY

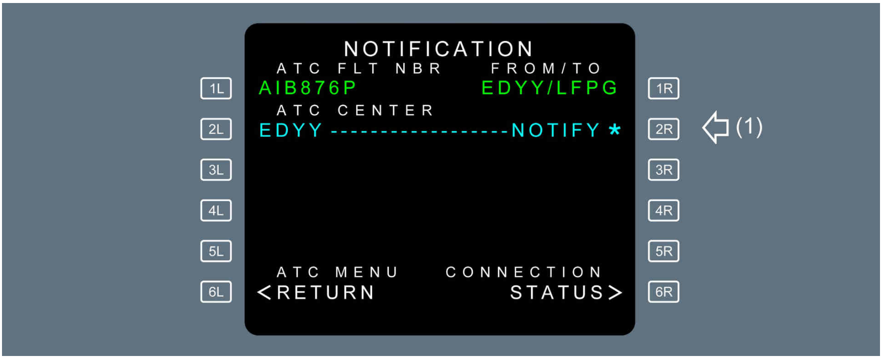
Ident.: DSC-46-10-50-00021048.0001001 / 21 MAR 17
Applicable to: ALL

- **On the MCDU:**

NOTIFICATION Page:

NOTIFY.. SELECT See (1)

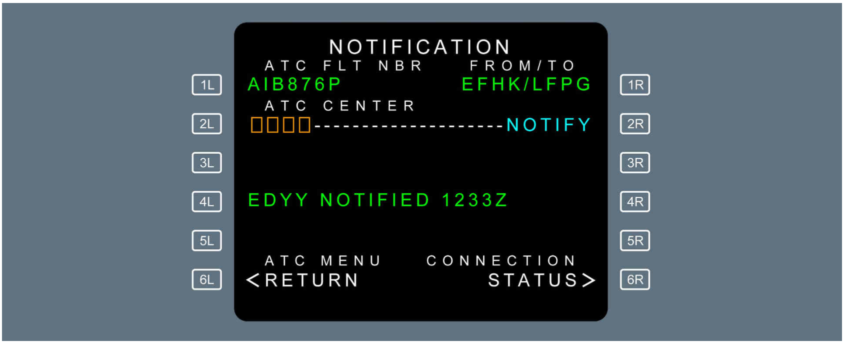
The flight crew enters the ATC code via the MCDU scratchpad, if the FMS does not enter the ATC code automatically.


```
NOTIFICATION
 ATC FLT NBR         FROM/TO
AIB876P            EDYY/LFPG
 ATC CENTER
EDYY -----------------NOTIFY *



 ATC MENU          CONNECTION
<RETURN               STATUS>
```

If the ATC center accepts the notification:

When ATC center accepts the notification, the MCDU displays the name of the notified ATC center:

ATC NOTIFIED on the MCDU

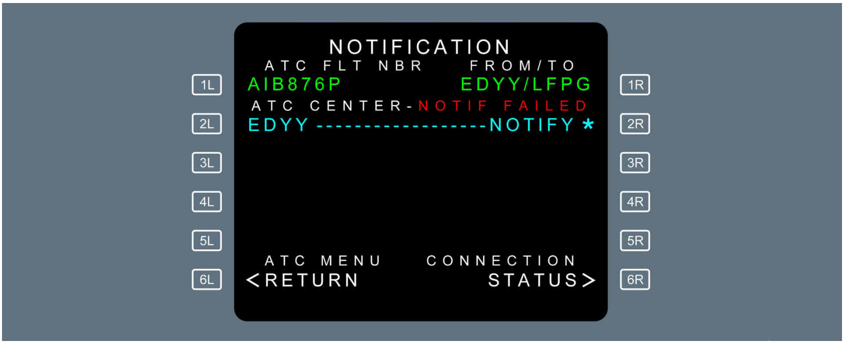

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
        NOTIFICATION
  ATC FLT NBR        FROM/TO
AIB876P            EFHK/LFPG
  ATC CENTER
□□□□-------------------NOTIFY


EDYY NOTIFIED 1233Z


  ATC MENU        CONNECTION
<RETURN               STATUS>
```

- **If the notification fails:**

  If the notification fails, the MCDU displays NOTIF FAILED information:

NOTIF FAILED on the MCDU


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
        NOTIFICATION
  ATC FLT NBR        FROM/TO
AIB876P            EDYY/LFPG
 ATC CENTER-NOTIF FAILED
EDYY -----------------NOTIFY *




  ATC MENU        CONNECTION
<RETURN               STATUS>
```

Note:
1. *For ADS-C ⊲ operations, check on the CONNECTION STATUS page of the MCDU, that the ADS-C ⊲ is set to ARMED (ON for FANS A ⊲) before sending a notification.*
2. *The notified ATC center initiates the CPDLC and/or ADS-C ⊲ connection. Therefore, re-notifications should be avoided.*
3. *An automatic transfer from one ATC center to the next ATC center can be expected, if:*
   - *The MCDU displays the next ATC code, on the CONNECTION STATUS Page*
   - *The DCDU displays NEXT ATC information with the desired ATC code, on the default screen, when no datalink message is displayed.*

HOW TO CONNECT

Ident.: DSC-46-10-50-10-00021049.0001001 / 21 MAR 17
Applicable to: ALL

CPDLC CONNECTION

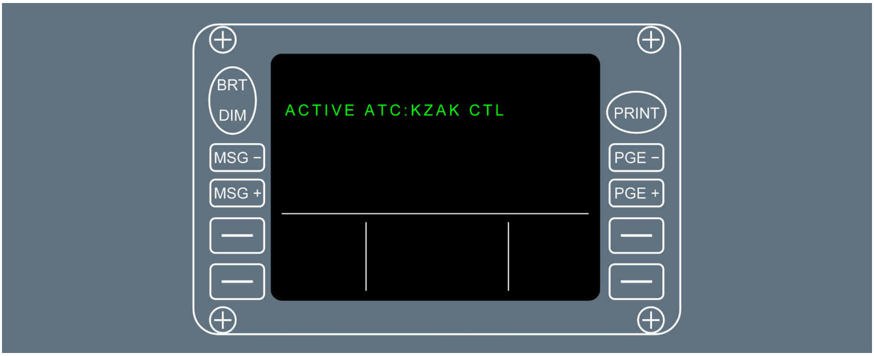
CONNECTION TO ACTIVE ATC

The ATC center initializes the CPDLC connection, when the ATC center receives a notification from the aircraft.
The DCDU displays the connected ATC (ACTIVE ATC), when the connection is established.
The MCDU displays the connected ATC (ACTIVE ATC) on the CONNECTION STATUS page.

ACTIVE ATC..VERIFY

The flight crew must verify that the desired ATC center is connected.

ACTIVE ATC on the DCDU



ACTIVE ATC:KZAK CTL

CONNECTION TO NEXT ATC

The active ATC can transfer the datalink connection to a next ATC without requiring a flight crew action.
If the active ATC transfers the connection to the next ATC, the DCDU will automatically display the next ATC code in the NEXT ATC field, on the default screen, under the next ATC code in the NEXT ATC field.

When the flight crew receives a message of service termination from the active ATC, the next ATC becomes the active ATC.

Ident.: DSC-46-10-50-10-00021050.0001001 / 21 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

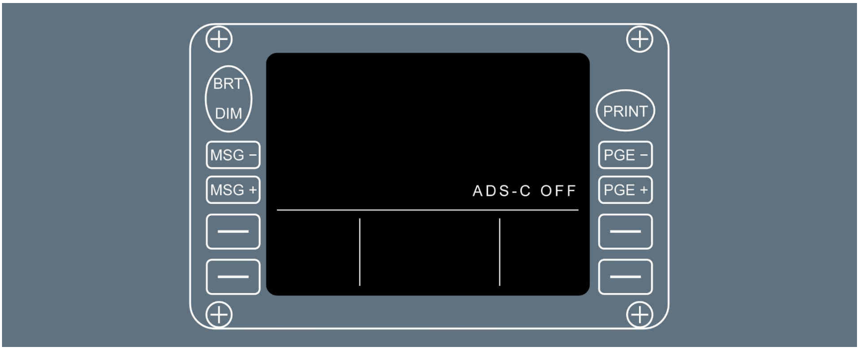
ADS-C CONNECTION

■ If the ADS-C is OFF:

The ADS-C is not connected.

The CONNECTION STATUS page of the MCDU displays ADS-C OFF.
The DCDU displays ADS-C OFF:

ADS-C OFF on the DCDU



■ If the ADS-C is ON:

- **On the MCDU:**
  ADS-C DETAIL Page
  or
  ADS DETAIL Page:

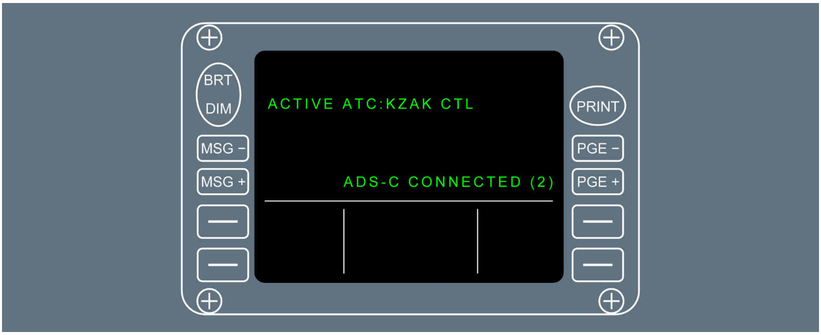
  CONNECTED ATC.. VERIFY
  The flight crew must verify that the desired ATC center is connected.

The ADS-C DETAIL / ADS DETAIL page displays connected ATC centers. for information displayed on the ADS-C DETAIL / ADS DETAIL page.Refer to DSC-46-10-40-30 ADS-C DETAIL.

- **On the DCDU:**

  The DCDU displays ADS-C ON and the number of connected ATC centers:

ADS-C CONNECTED and ACTIVE ATC on the DCDU



```
ACTIVE ATC:KZAK CTL

              ADS-C CONNECTED (2)
```

HOW TO SEND REQUEST TO ATC

Ident.: DSC-46-10-50-00021051.0001001 / 21 MAR 17
Applicable to: ALL

AIRCRAFT REQUEST OF LATERAL FLIGHT PLAN DEVIATION

Example: DEVIATION REQUEST DUE TO WEATHER

- **On the MCDU:**

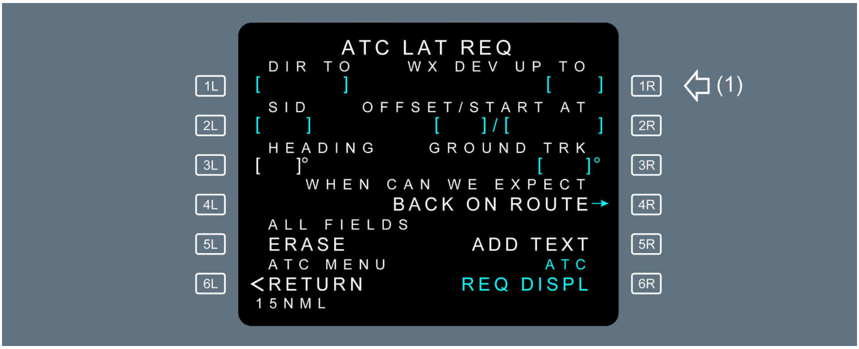
  ATC LAT REQ Page:

  WX DEV UP TO.. INSERT See (1)

  Insert an offset distance and direction via the MCDU scratchpad.

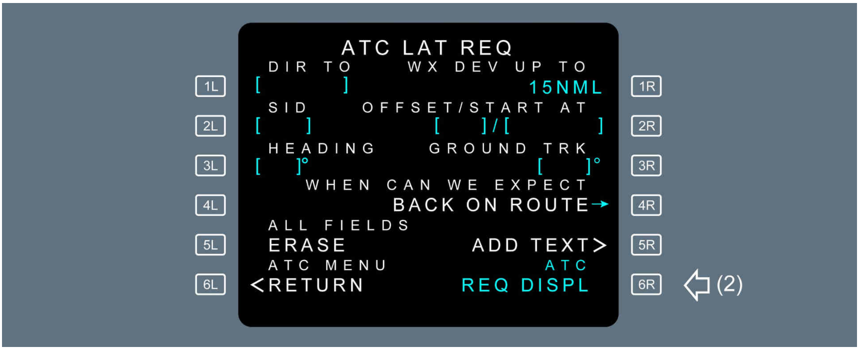
  REQ DISPL... SELECT See (2)

  The DCDU displays prepared request.



ATC LAT REQ
DIR TO WX DEV UP TO
[ ] [ ]
SID OFFSET/START AT
[ ] [ ]/[ ]
HEADING GROUND TRK
[ ]° [ ]°
WHEN CAN WE EXPECT
BACK ON ROUTE→
ALL FIELDS
ERASE ADD TEXT
ATC MENU ATC
<RETURN REQ DISPL
15NML

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
(1)



ATC LAT REQ
DIR TO WX DEV UP TO
[ ] 15NML
SID OFFSET/START AT
[ ] [ ]/[ ]
HEADING GROUND TRK
[ ]° [ ]°
WHEN CAN WE EXPECT
BACK ON ROUTE→
ALL FIELDS
ERASE ADD TEXT>
ATC MENU ATC
<RETURN REQ DISPL

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
(2)

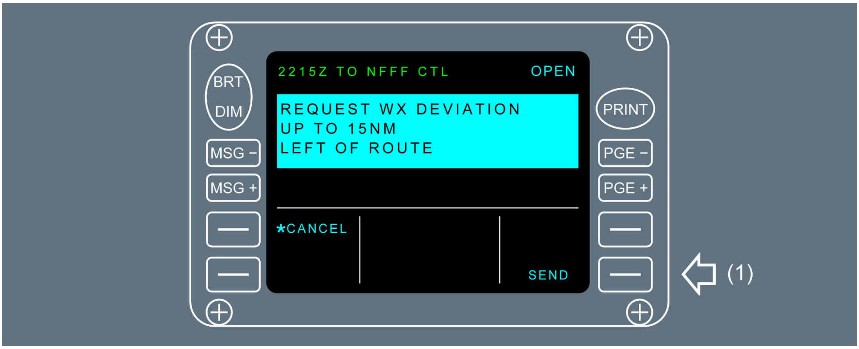
- **On the DCDU:**

  SEND.. SELECT See (1)

  L2 *The DCDU displays the message and the message status in green.*

  L1 CLOSE.. SELECT See (2)

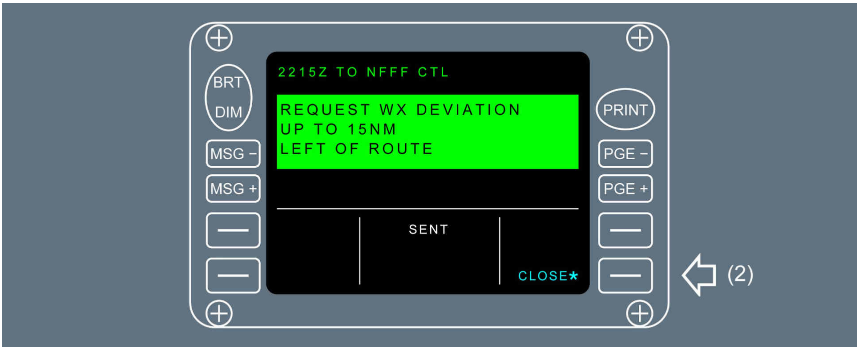
  Closing the message clears the DCDU.



2215Z TO NFFF CTL OPEN

REQUEST WX DEVIATION
UP TO 15NM
LEFT OF ROUTE

BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +
*CANCEL
SEND
(1)



2215Z TO NFFF CTL

REQUEST WX DEVIATION
UP TO 15NM
LEFT OF ROUTE

SENT

BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +
CLOSE*
(2)

HOW TO ANSWER

Applicable to: ALL

Ident.: DSC-46-10-50-20-00021053.0001001 / 21 MAR 17

ATC IMMEDIATE CLEARANCE

Example: WEATHER DEVIATION Clearance

- **On the glareshield:**
  ATC MSG pb...PRESS
  The aural and visual alerts stop.
- **On the DCDU:**
  WILCO...SELECT See (1)
  The message status changes to WILCO See (2) .

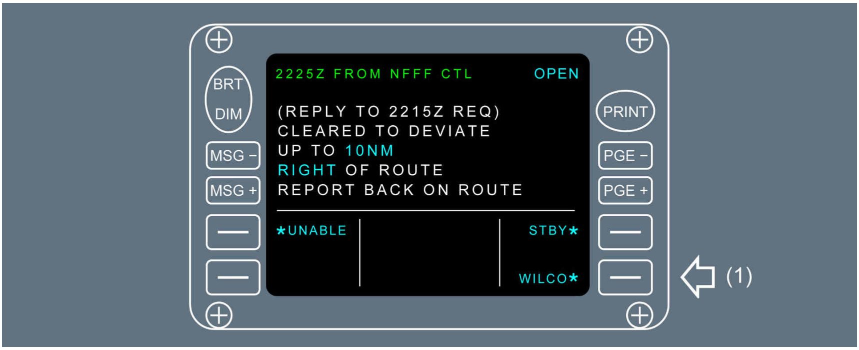
SEND.. SELECT See (3)

L2 *The DCDU displays the message and the message status in green See (4) .*

L1 CLOSE... SELECT See (5)

Closing the message clears the DCDU.

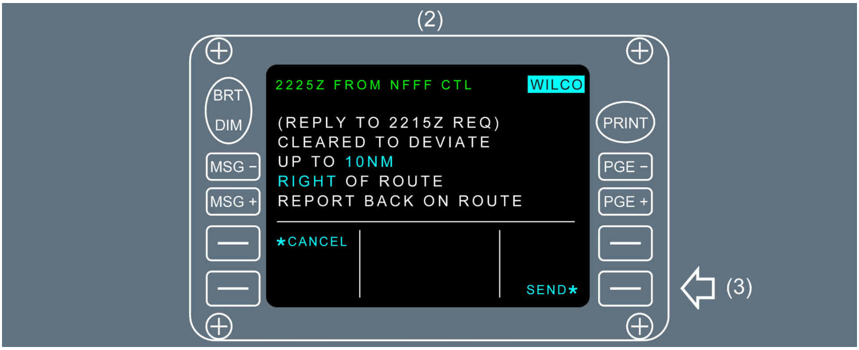
The flight crew must insert the offset in the FMGES flight plan.



2225Z FROM NFFF CTL OPEN

(REPLY TO 2215Z REQ)
CLEARED TO DEVIATE
UP TO 10NM
RIGHT OF ROUTE
REPORT BACK ON ROUTE

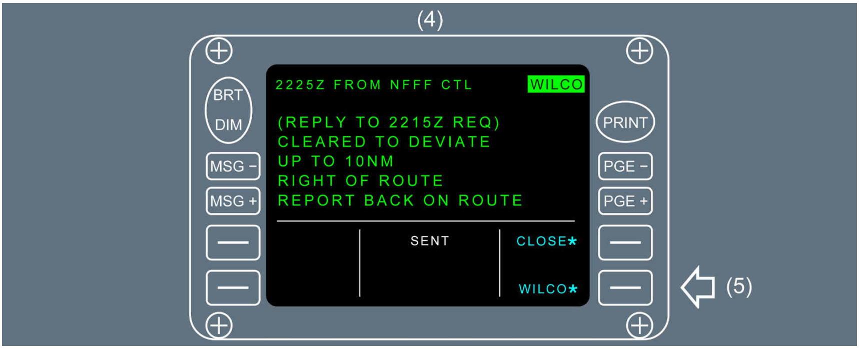
UNABLE STBY
WILCO*



2225Z FROM NFFF CTL WILCO

(REPLY TO 2215Z REQ)
CLEARED TO DEVIATE
UP TO 10NM
RIGHT OF ROUTE
REPORT BACK ON ROUTE

*CANCEL
SEND*



2225Z FROM NFFF CTL WILCO

(REPLY TO 2215Z REQ)
CLEARED TO DEVIATE
UP TO 10NM
RIGHT OF ROUTE
REPORT BACK ON ROUTE

SENT CLOSE*
WILCO*

ATC DEFERRED CLEARANCE

Example: CLIMB Clearance

- **On the glareshield:**

  ATC MSG pb..........PRESS

  The aural and visual alerts stop.

- **On the DCDU:**

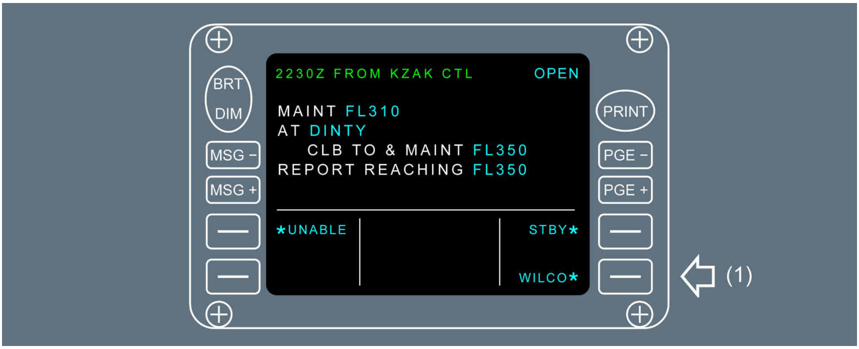
  WILCO..........SELECT See (1)

  The message status changes to WILCO See (2) .
  Parameters of the clearance (in the example: DINTY and FL 350) change into magenta. The FMGES monitors these parameters. MONITORING appears in the message information area of the DCDU.

  SEND.......... SELECT See (3)

L2 *The DCDU displays the message and the message status in green.*

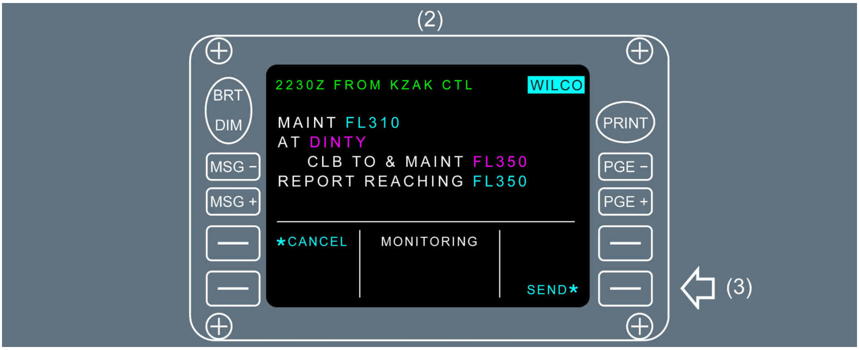
L1 *The flight crew can close the message, if the message is not closed automatically.*



2230Z FROM KZAK CTL OPEN

MAINT FL310
AT DINTY
CLB TO & MAINT FL350
REPORT REACHING FL350

UNABLE STBY
WILCO*



2230Z FROM KZAK CTL WILCO

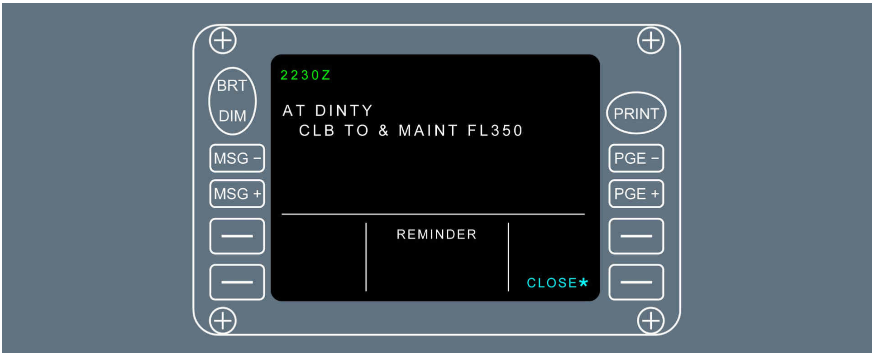
MAINT FL310
AT DINTY
CLB TO & MAINT FL350
REPORT REACHING FL350

*CANCEL MONITORING
SEND*

REMINDER OF THE CLEARANCE MESSAGE

The FMGES monitoring clearance parameters, signals to the ATSU, when the aircraft complies with conditions of clearance.
The system triggers visual and aural alerts, and the DCDU displays a clearance reminder message30 s before the applicability of the clearance (in this example, 30 s before reaching DINTY).
REMINDER appears in the information area of reminder message, on the DCDU. The absence of an ATC indication means that the clearance reminder message is a FMGES recall (message is not new).

Reminder Message on the DCDU



2230Z

AT DINTY
CLB TO & MAINT FL350

REMINDER

CLOSE*

Ident.: DSC-46-10-50-20-00021054.0001001 / 04 JUN 19

ATC NEGOTIATION MESSAGE

Example: WHEN CAN YOU ACCEPT Negotiation

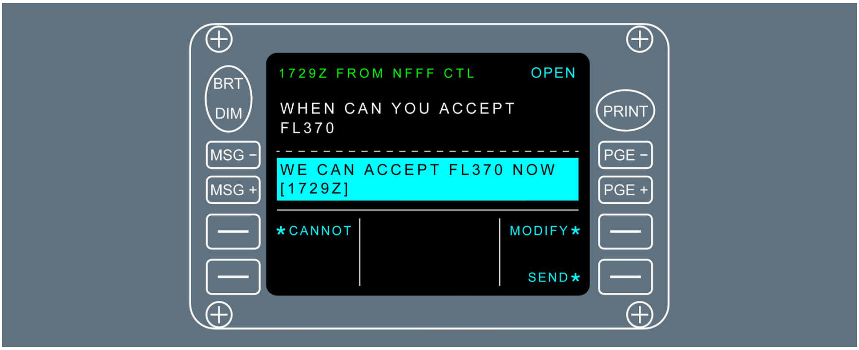
- **On the glareshield:**

  ATC MSG pb...PRESS

  The aural and visual alerts stop.

- **On the DCDU:**

  The DCDU displays the ATC negotiation message:



1729Z FROM NFFF CTL OPEN

WHEN CAN YOU ACCEPT
FL370

WE CAN ACCEPT FL370 NOW
[1729Z]

CANNOT MODIFY

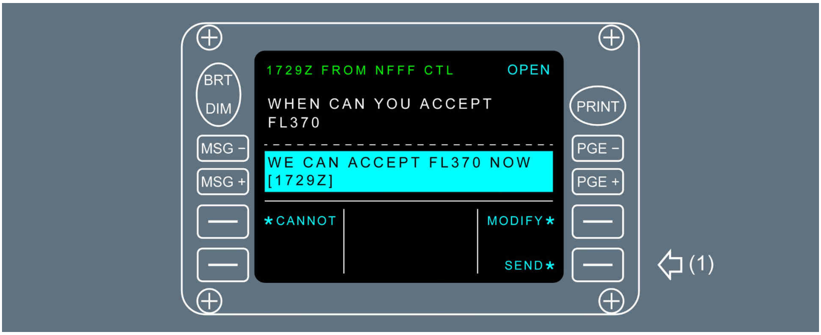
SEND*

Note: *A default answer is automatically generated on the DCDU and proposed to the flight crew.*

- **If the flight crew can comply with the proposed action immediately:**
  - **On the DCDU:**

    SEND...SELECT See (1)

    The flight crew can close the message, if the message is not closed automatically.



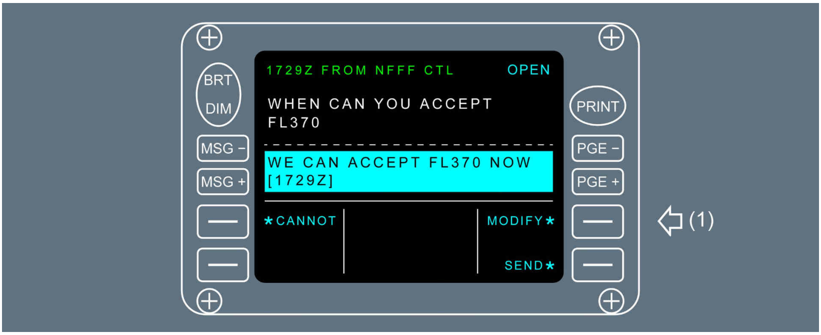
1729Z FROM NFFF CTL OPEN
WHEN CAN YOU ACCEPT
FL370
WE CAN ACCEPT FL370 NOW
[1729Z]

BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +
*CANNOT
MODIFY*
SEND*
(1)

- **If the flight crew can comply with the proposed action, but cannot perform the proposed action immediately:**
  - **On the DCDU:**

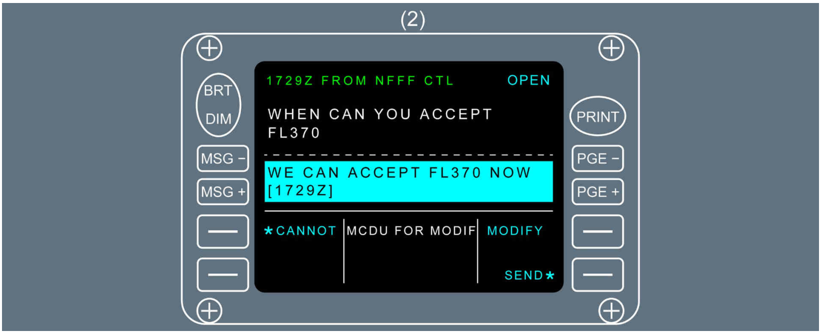
    MODIFY...SELECT See (1)

    MCDU FOR MODIF/MCDU FOR EDIT appears on the DCDU, in the message information area See (2).
    The MESSAGE MODIFY page appears automatically on the corresponding MCDU if an ATC page was displayed See (3) .



1729Z FROM NFFF CTL OPEN
WHEN CAN YOU ACCEPT
FL370
WE CAN ACCEPT FL370 NOW
[1729Z]

BRT
DIM
MSG –
MSG +
PRINT
PGE –
PGE +
*CANNOT
MODIFY*
SEND*
(1)


(2)

1729Z FROM NFFF CTL OPEN
WHEN CAN YOU ACCEPT
FL370

WE CAN ACCEPT FL370 NOW
[1729Z]

*CANNOT | MCDU FOR MODIF | MODIFY
SEND*

- **On the MCDU:**

  MESSAGE MODIFY Page

  The flight crew specifies, when they can comply with the proposed action.

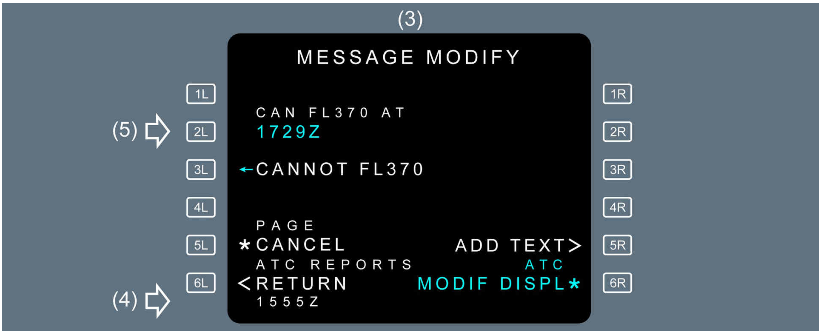
  A default time value appears in the 2L field, on the MESSAGE MODIFY page. The flight crew can modify the default time value via the MCDU scratchpad.

  CAN FL370 AT..SELECT See (5)

  The flight crew can propose a new time value via the scratchpad See (4) . The new time value will be inserted to the datalink message via the MESSAGE MODIFY page See (6) .

  ATC MODIF DISPL...SELECT See (7)

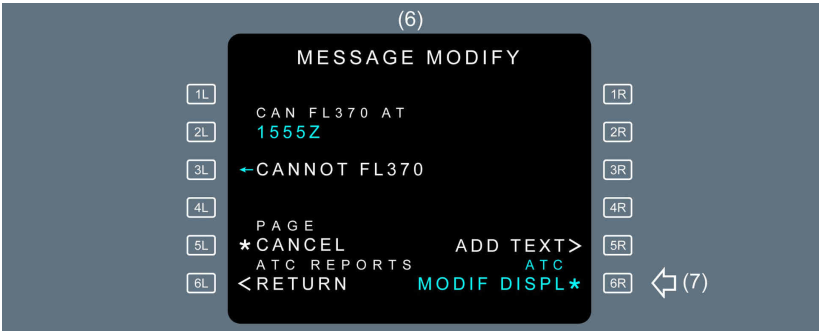
  The message appears on the DCDU See (8).


(3)

MESSAGE MODIFY

CAN FL370 AT
1729Z
←CANNOT FL370

PAGE
*CANCEL ADD TEXT>
ATC REPORTS ATC
<RETURN MODIF DISPL*
1555Z



MESSAGE MODIFY

CAN FL370 AT
1555Z

←CANNOT FL370

PAGE
*CANCEL
ATC REPORTS
<RETURN

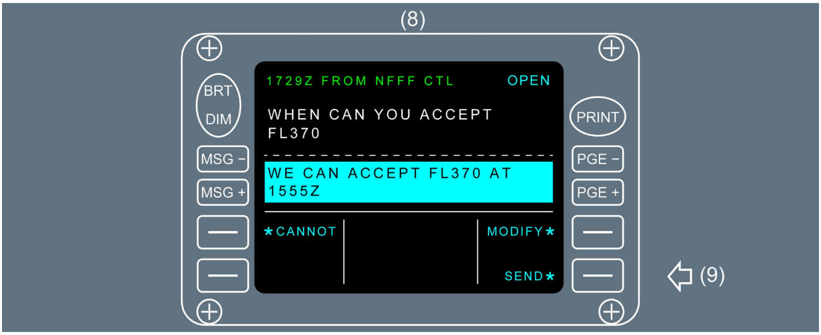
ADD TEXT>
ATC
MODIF DISPL*

- **On the DCDU:**

  SEND..SELECT See (9)

  L2 *The OPEN status of the message disappears.*

  L1 *The flight crew can close the message, if the message is not closed automatically.*



1729Z FROM NFFF CTL OPEN

WHEN CAN YOU ACCEPT
FL370

WE CAN ACCEPT FL370 AT
1555Z

*CANNOT
MODIFY*
SEND*

If the flight crew cannot comply with the proposed action:

- **On the DCDU:**

  CANNOT..SELECT See (1)

  The generated message changes from the positive message (CAN) to a negative message (CANNOT).

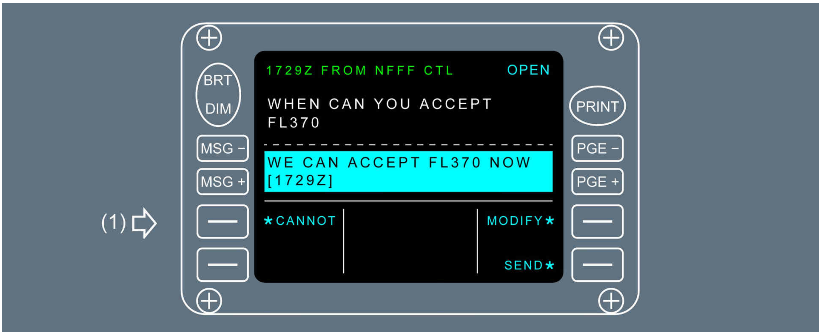
  L2 *The message status remains OPEN See (2) .*

  L1 SEND..SELECT See (3)

  The flight crew can close the message, if the message is not closed automatically.

  L2 *The OPEN status of the message disappears.*

L1

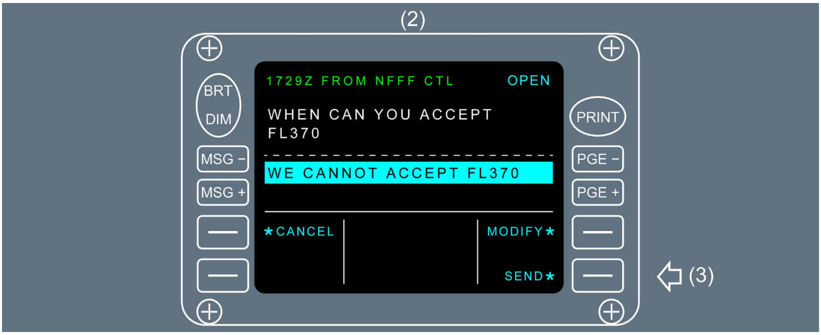


1729Z FROM NFFF CTL OPEN

WHEN CAN YOU ACCEPT
FL370

WE CAN ACCEPT FL370 NOW
[1729Z]

(1)
BRT
DIM
MSG −
MSG +
PRINT
PGE −
PGE +
*CANNOT
MODIFY*
SEND*



1729Z FROM NFFF CTL OPEN

WHEN CAN YOU ACCEPT
FL370

WE CANNOT ACCEPT FL370

(2)
BRT
DIM
MSG −
MSG +
PRINT
PGE −
PGE +
*CANCEL
MODIFY*
SEND*
(3)

Ident.: DSC-46-10-50-20-00021055.0001001 / 21 MAR 17

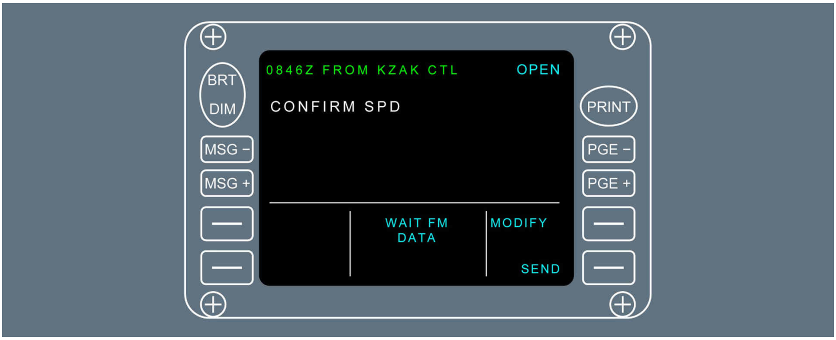
ATC REQUEST OF NAVIGATION PARAMETER

Example: CONFIRM SPEED Request

RECEPTION

- **On the glareshield:**
  ATC MSG pb..PRESS
  The aural and visual alerts stop.
- **On the DCDU:**

  The DCDU displays the ATC confirmation request:



0846Z FROM KZAK CTL OPEN

CONFIRM SPD

Note: *The WAIT FM DATA appears on the DCDU, in the message information area upon the reception of confirmation request. The WAIT FM DATA indicates that the FMGES is preparing an answer.*

RESPONSE

- **On the DCDU:**

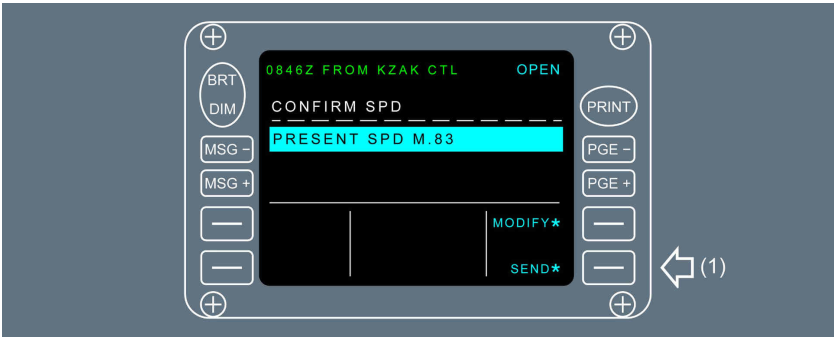
The ATSU automatically proposes a response via the DCDU. The WAIT FM DATA disappears from the message information area on the DCDU.

L2 The flight crew can modify the report by pressing MODIFY on the DCDU. When MODIFY is selected, the DCDU displays MCDU FOR MODIF in the message information area. Consequently, the MCDU will display the MSG MODIFY page.

L1 SEND..SELECT See (1)

L2 *The OPEN status of the message disappears.*

L1 *The flight crew can close the message, if the message is not closed automatically.*



0846Z FROM KZAK CTL OPEN

CONFIRM SPD

PRESENT SPD M.83

HOW TO SEND A POSITION REPORT

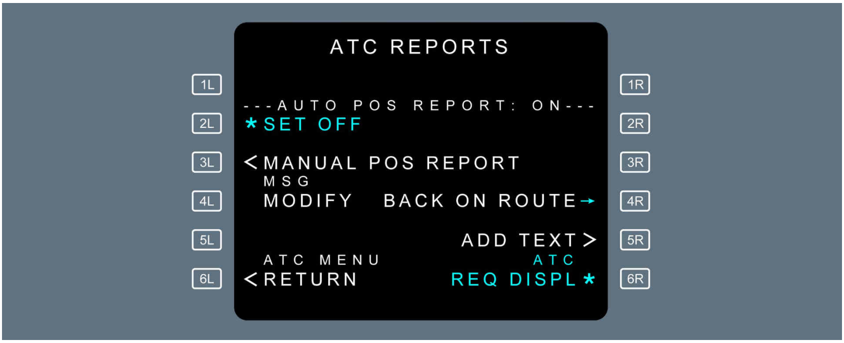
Ident.: DSC-46-10-50-00021056.0001001 / 21 MAR 17
Applicable to: ALL

- ### If the AUTO POS REPORT function is set to ON:

  - **On the MCDU:**

    ATC REPORTS Page:
    The MCDU displays AUTO POS REPORT: ON:

AUTO POS REPORT ON on the ATC REPORTS Page



```
           ATC REPORTS

---AUTO POS REPORT: ON---
*SET OFF

<MANUAL POS REPORT
 MSG
 MODIFY   BACK ON ROUTE→

              ADD TEXT>
 ATC MENU            ATC
<RETURN        REQ DISPL*
```

The FMGES generates automatically the position report message on the DCDU, when a waypoint is sequenced.

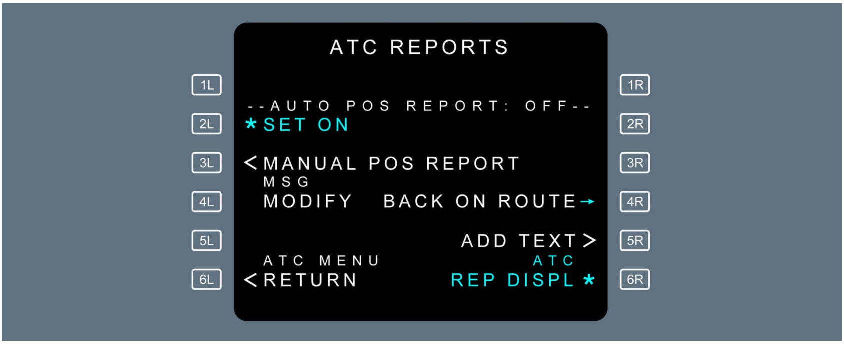
Note: *It is recommended to update the flight plan during the flight. The FMGES offset function should be used, when it is appropriate. When the heading mode is used, the flight crew should monitor and sequence waypoints of the flight plan as required.*

- ### If the AUTO POS REPORT function is set to OFF:

  - **On the MCDU:**

    ATC REPORTS Page:
    The MCDU displays AUTO POS REPORT: OFF:

AUTO POS REPORT OFF on the ATC REPORTS Page



ATC REPORTS

--AUTO POS REPORT: OFF--
*SET ON

<MANUAL POS REPORT
MSG
MODIFY   BACK ON ROUTE→

ADD TEXT>
ATC MENU   ATC
<RETURN   REP DISPL*

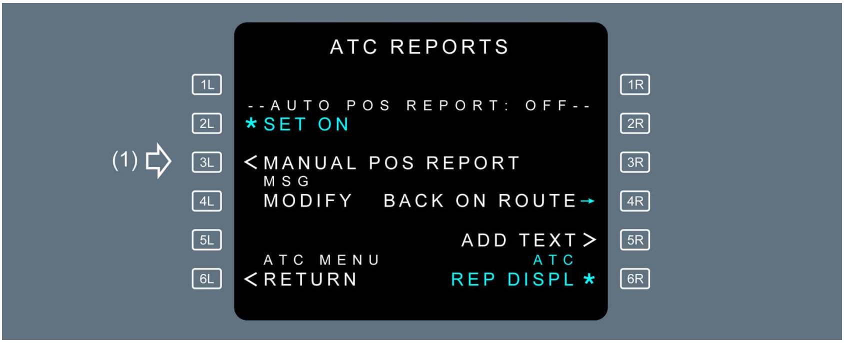
MANUAL POSITION REPORT.. SELECT See (1)

POSITION REPORTS pages 1/3, 2/3 and 3/3 See (2) show data that is automatically provided by the FMGES. The crew can manually enter available fields, if it is desired.

L2 *Refer to DSC-46-10-40-30 POSITION REPORT for information displayed on all POSITION REPORT Pages.*

L1 ATC REP DISPL.. SELECT See (3)

The DCDU displays prepared position report.

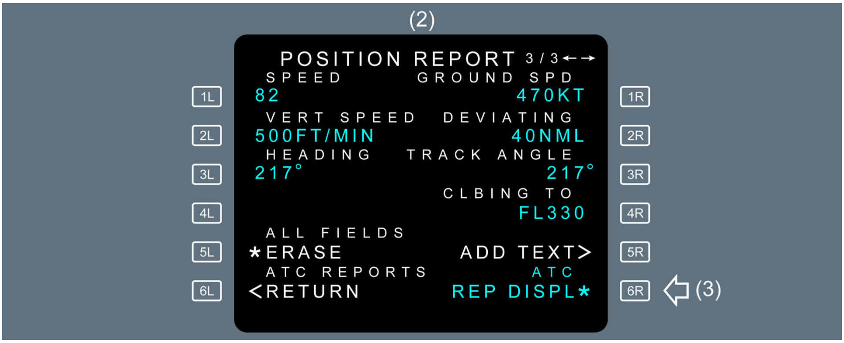


ATC REPORTS

--AUTO POS REPORT: OFF--
*SET ON

<MANUAL POS REPORT
MSG
MODIFY   BACK ON ROUTE→

ADD TEXT>
ATC MENU   ATC
<RETURN   REP DISPL*



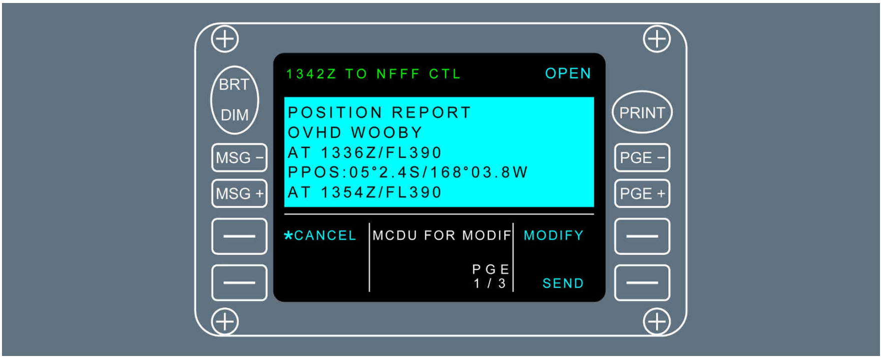
```
POSITION REPORT 3/3←→
 SPEED        GROUND SPD
82                 470KT
 VERT SPEED   DEVIATING
500FT/MIN          40NML
 HEADING     TRACK ANGLE
217°                217°
              CLBING TO
                   FL330
 ALL FIELDS
*ERASE         ADD TEXT>
 ATC REPORTS         ATC
<RETURN      REP DISPL*
```

- **On the DCDU:**

  Note: *The flight crew must read and verify all pages of the position report before sending the report to the ATC.*

L2 The flight crew can modify the position report or update parameters of the position report by pressing MODIFY on the DCDU. When MODIFY is selected, the DCDU displays MCDU FOR MODIF in the message information area. Consequently, the MCDU will display the MSG MODIFY page.

Prepared Position Report Request on the DCDU

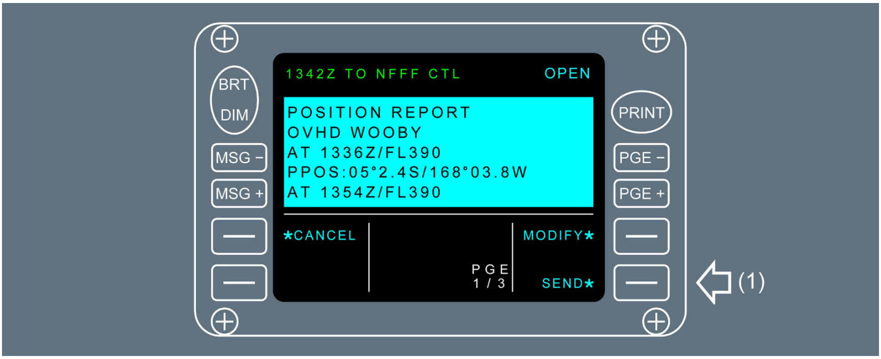


```
1342Z TO NFFF CTL          OPEN
POSITION REPORT
OVHD WOOBY
AT 1336Z/FL390
PPOS:05°2.4S/168°03.8W
AT 1354Z/FL390
*CANCEL  MCDU FOR MODIF  MODIFY
                    PGE
                    1/3    SEND
```

L1 SEND.. SELECT See (1)

L2 *The OPEN status of the message disappears.*

L1 *The flight crew can close the message, if the message is not closed automatically.*



1342Z TO NFFF CTL OPEN

POSITION REPORT
OVHD WOOBY
AT 1336Z/FL390
PPOS:05°2.4S/168°03.8W
AT 1354Z/FL390

HOW TO OBTAIN DCL

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Ident.: DSC-46-10-50-30-00021057.0001001 / 21 MAR 17

DEPARTURE CLEARANCE REQUEST

- **On the MCDU:**

  DEPART REQ Page

  FROM/TO..INSERT See (1)

  Enter the departure and arrival airports, if the system does not automatically display the departure and arrivals airports.

  A/C TYPE..INSERT See (2)

  Enter the aircraft type, if the system does not automatically display the aircraft type.

  ATIS CODE...INSERT See (3)

  Enter the ATIS code, if the system does not automatically display the ATIS code.

  GATE.. INSERT See (4)

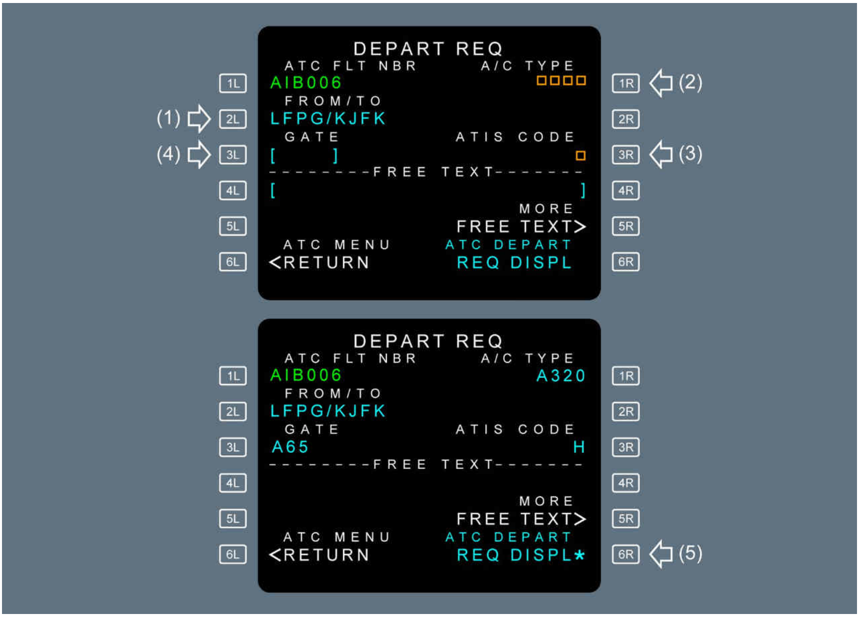
  Enter the gate or stand number, if the gate or stand number is known.

  REQ DISPL..SELECT See (5)

  The request is ready to be sent via the DCDU.

  L2 *The DCDU displays the request on a blue background.*

L1



```
       DEPART REQ
 ATC FLT NBR        A/C TYPE
AIB006                  □□□□
 FROM/TO
LFPG/KJFK
 GATE               ATIS CODE
[    ]                     □
--------FREE TEXT-------
[                          ]
                        MORE
                  FREE TEXT>
 ATC MENU         ATC DEPART
<RETURN           REQ DISPL
```

```
       DEPART REQ
 ATC FLT NBR        A/C TYPE
AIB006                  A320
 FROM/TO
LFPG/KJFK
 GATE               ATIS CODE
A65                        H
--------FREE TEXT-------

                        MORE
                  FREE TEXT>
 ATC MENU         ATC DEPART
<RETURN           REQ DISPL*
```

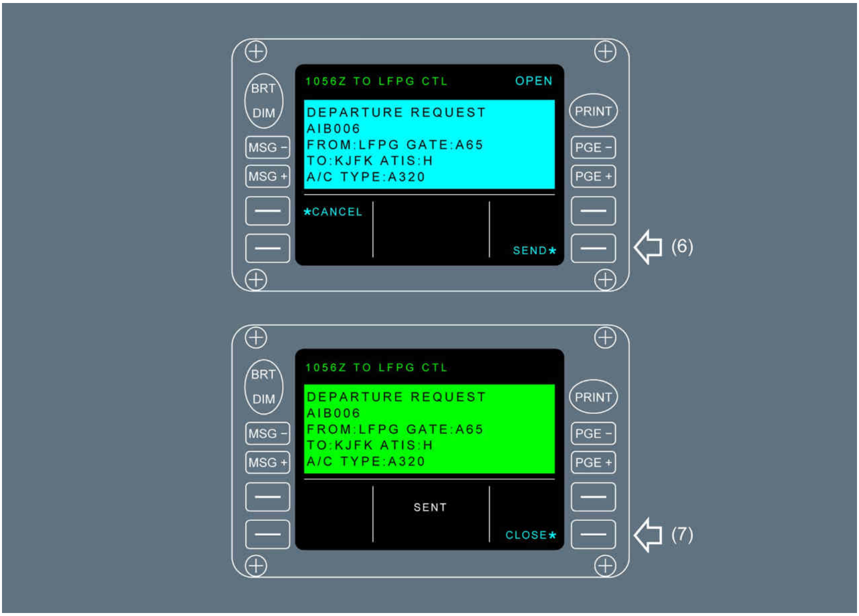
- **On the DCDU :**

  SEND.. SELECT See (6)

  L2 *The DCDU displays the message on a green background, and the OPEN status disappears.*

  L1 CLOSE.. SELECT See (7)

  Closing the message clears the screen.



1056Z TO LFPG CTL OPEN

DEPARTURE REQUEST
AIB006
FROM:LFPG GATE:A65
TO:KJFK ATIS:H
A/C TYPE:A320

CANCEL SEND

1056Z TO LFPG CTL

DEPARTURE REQUEST
AIB006
FROM:LFPG GATE:A65
TO:KJFK ATIS:H
A/C TYPE:A320

SENT CLOSE*

Ident.: DSC-46-10-50-30-00021058.0001001 / 05 MAR 19

DEPARTURE CLEARANCE RECEPTION

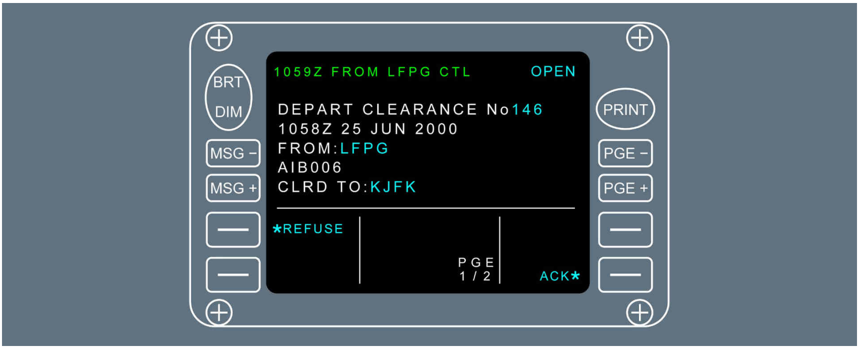
- **On the glareshield:**

  ATC MSG pb .... PRESS

  The aural and visual alerts stop.

- **On the DCDU:**

  The DCDU displays the departure clearance:



1059Z FROM LFPG CTL OPEN

DEPART CLEARANCE No146
1058Z 25 JUN 2000
FROM:LFPG
AIB006
CLRD TO:KJFK

*REFUSE
PGE
1 / 2
ACK*

Ident.: DSC-46-10-50-30-00021059.0001001 / 21 MAR 17

DEPARTURE CLEARANCE READ-BACK

■ ACKNOWLEDGE:

● On the DCDU:

ACK..SELECTSee (1)

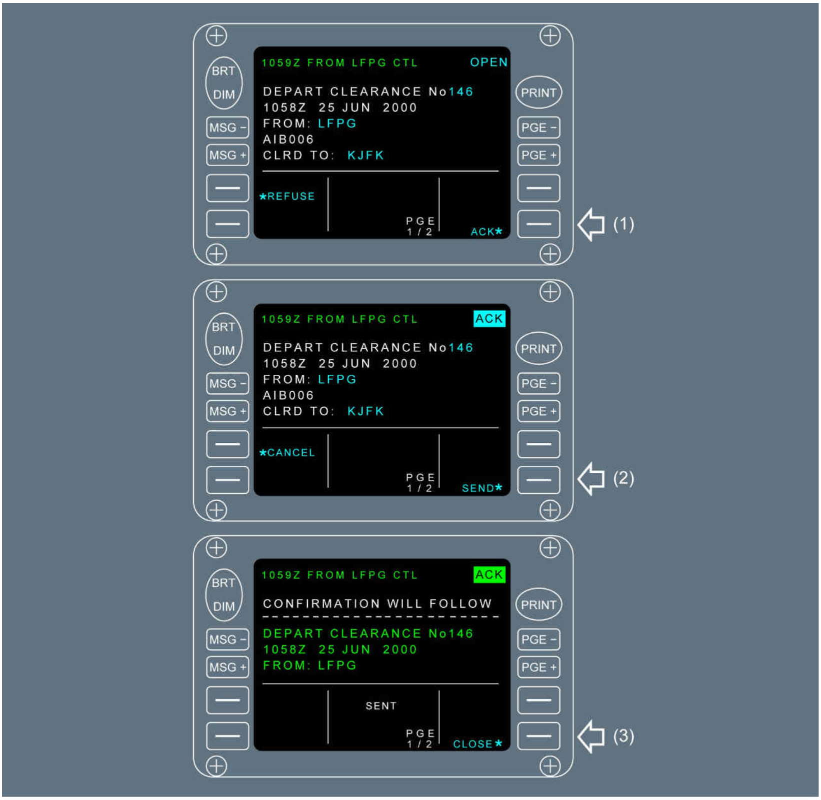
L2 *The message status changes to ACK, on a blue background.*

L1 SEND..SELECT See (2)

The clearance must not be complied with, before a confirmation is received. CONFIRMATION WILL FOLLOW at the top of the acknowledgement message reminds the flight crew.

CLOSE..SELECT See (3)

Closing the message clears the screen.



1059Z FROM LFPG CTL OPEN
DEPART CLEARANCE No146
1058Z 25 JUN 2000
FROM: LFPG
AIB006
CLRD TO: KJFK
*REFUSE
PGE 1 / 2
ACK*

1059Z FROM LFPG CTL ACK
DEPART CLEARANCE No146
1058Z 25 JUN 2000
FROM: LFPG
AIB006
CLRD TO: KJFK
*CANCEL
PGE 1 / 2
SEND*

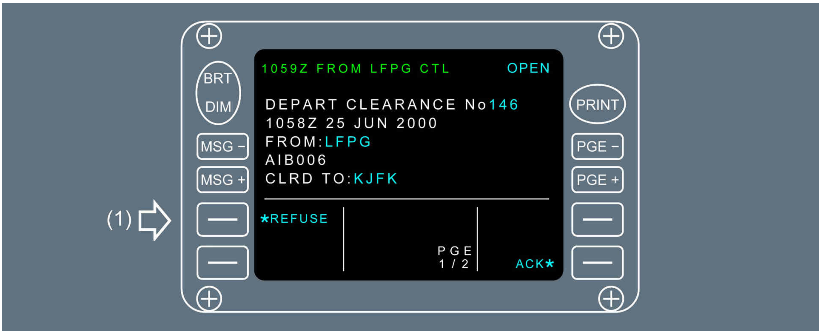
1059Z FROM LFPG CTL ACK
CONFIRMATION WILL FOLLOW
DEPART CLEARANCE No146
1058Z 25 JUN 2000
FROM: LFPG
SENT
PGE 1 / 2
CLOSE*

■ REFUSE:

● On the DCDU:

REFUSE... SELECT See (1)

Datalink cannot send a refuse message. The flight crew must report the clearance refusal to the ATC by voice.



1059Z FROM LFPG CTL OPEN

DEPART CLEARANCE No146
1058Z 25 JUN 2000
FROM:LFPG
AIB006
CLRD TO:KJFK

REFUSE PGE 1 / 2 ACK

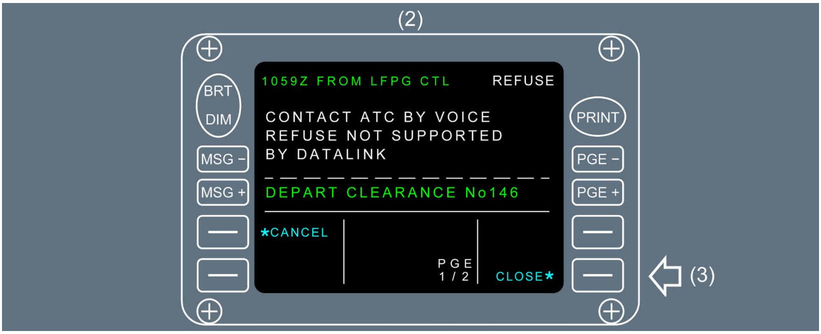
- **On the RMP:**

  The crew must contact the ATC by voice.

  The refusal of departure clearance cannot be sent via datalink. CONTACT ATC BY VOICE appears on the DCDU See (2) .

- **On the DCDU:**
  CLOSE...SELECT See (3)

  Closing the message clears the screen.



1059Z FROM LFPG CTL REFUSE

CONTACT ATC BY VOICE
REFUSE NOT SUPPORTED
BY DATALINK
DEPART CLEARANCE No146

CANCEL PGE 1 / 2 CLOSE

Ident.: DSC-46-10-50-30-00021060.0001001 / 21 MAR 17

DCL READ-BACK CONFIRMATION

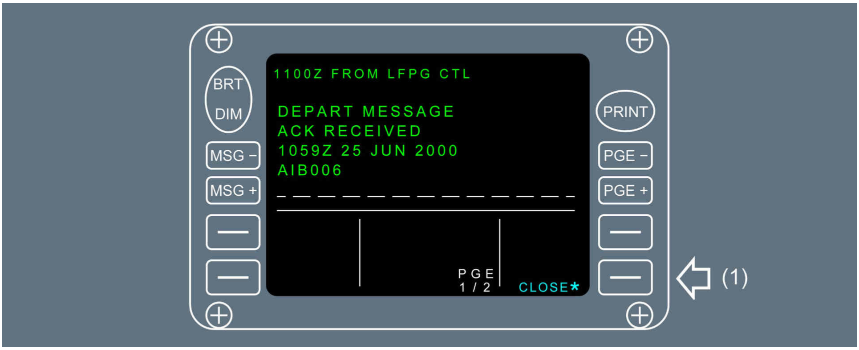
- **On the glareshield:**
  ATC MSG pb .... PRESS

  The aural and visual alerts stop.

- **On the DCDU:**

  CLOSE.. SELECT See (1)

  The message is automatically stored.



1100Z FROM LFPG CTL

DEPART MESSAGE
ACK RECEIVED
1059Z 25 JUN 2000
AIB006

Note: *When a read-back confirmation is received, the flight crew can proceed, in accordance with the clearance displayed on the DCDU.*
The flight crew must update the flight plan if necessary.

HOW TO OBTAIN OCL

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Ident.: DSC-46-10-50-40-00021061.0001001 / 21 MAR 17

OCEANIC CLEARANCE REQUEST

- **On the MCDU:**

  OCEANIC REQ Page

  ENTRY-POINT...INSERT See (1)

  Enter a fix name or a latitude/longitude value.

  REQ MACH..INSERT See (2)

  Enter the Mach number required.

  OCEAN ATC...INSERT See (3)

  Enter the oceanic ATC center code.

  AT TIME..INSERT See (4)

  Enter the time at the oceanic entry point.

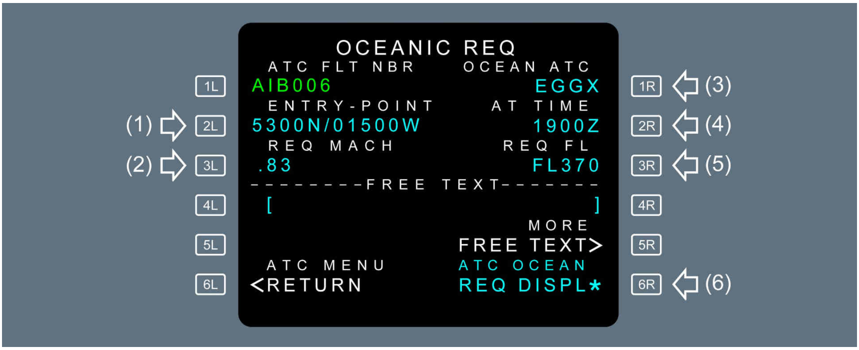
  REQ FL..INSERT See (5)

  Enter the requested flight level.

ATC OCEAN REQ DISPL.. INSERT See (6)

The request is ready to be sent via the DCDU.

The DCDU displays the request on a blue background.



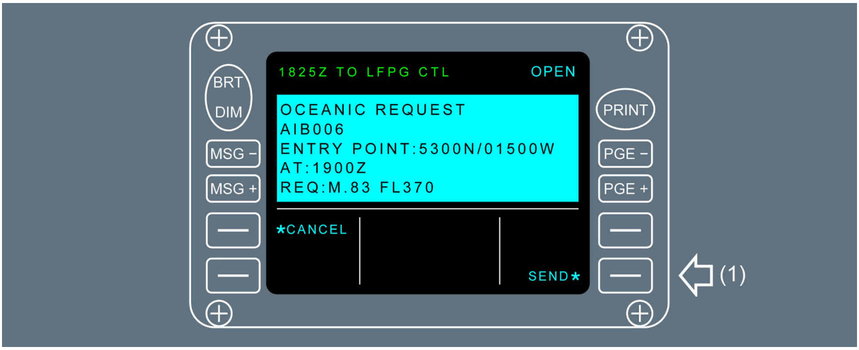
```
       OCEANIC REQ
  ATC FLT NBR      OCEAN ATC
AIB006                  EGGX
  ENTRY-POINT        AT TIME
5300N/01500W           1900Z
  REQ MACH            REQ FL
.83                    FL370
--------FREE TEXT-------
[                          ]
                        MORE
                  FREE TEXT>
  ATC MENU         ATC OCEAN
<RETURN          REQ DISPL*
```

- **On the DCDU:**

SEND.. SELECT See (1)

The DCDU displays the message on a green background, and the OPEN status disappears.

The flight crew can close the message, if the message is not closed automatically.



```
1825Z TO LFPG CTL          OPEN
OCEANIC REQUEST
AIB006
ENTRY POINT:5300N/01500W
AT:1900Z
REQ:M.83 FL370
*CANCEL
                          SEND*
```

Ident.: DSC-46-10-50-40-00021062.0001001 / 21 MAR 17

OCEANIC CLEARANCE RECEPTION

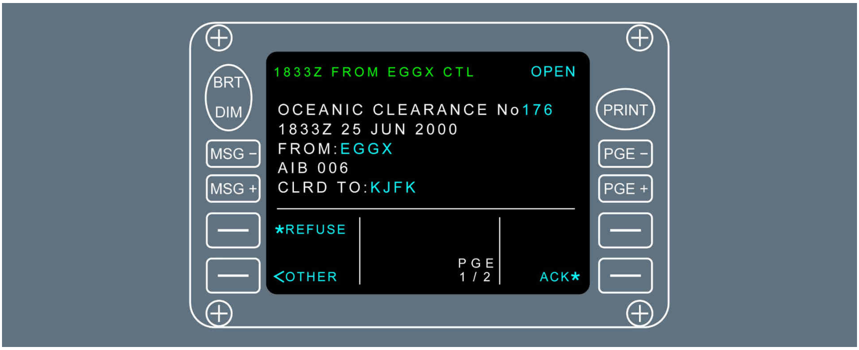
- **On the glareshield:**

ATC MSG pb .... PRESS

The aural and visual alerts stop.

- **On the DCDU:**

  The DCDU displays the oceanic clearance:



```
1833Z FROM EGGX CTL          OPEN

 OCEANIC CLEARANCE No176
 1833Z 25 JUN 2000
 FROM:EGGX
 AIB 006
 CLRD TO:KJFK

★REFUSE

                         PGE
<OTHER                   1/2        ACK★
```

Ident.: DSC-46-10-50-40-00021063.0001001 / 21 MAR 17

OCEANIC CLEARANCE READ-BACK

ACKNOWLEDGE

- **On the DCDU:**

  ACK....................SELECT See (1)

L2 *The message status changes to ACK, on a blue background.*

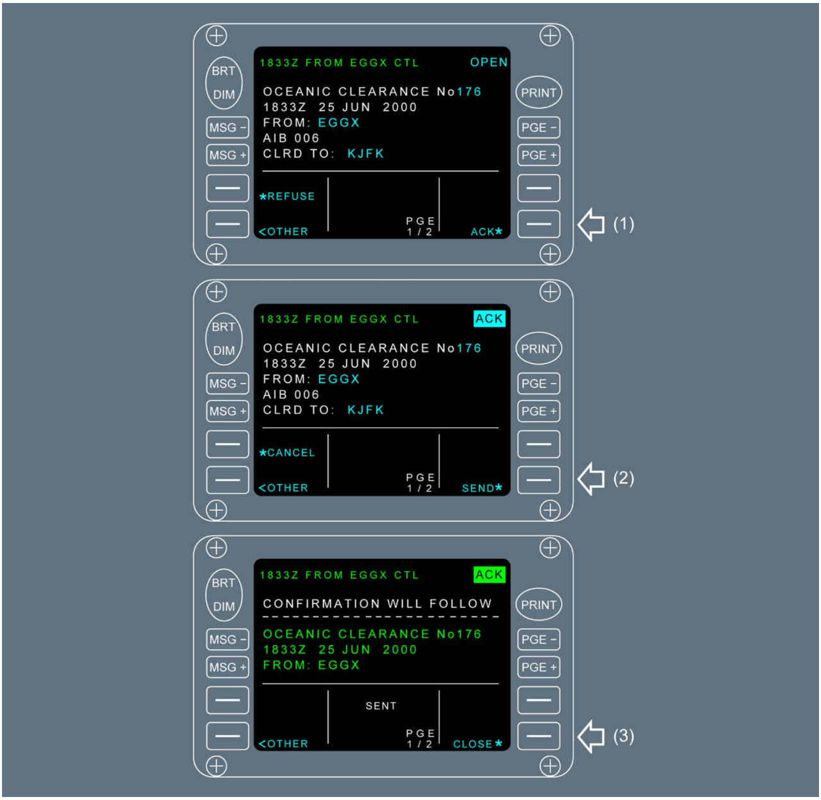
L1 SEND....................SELECT See (2)

The clearance must not be complied with, before a confirmation is received. CONFIRMATION WILL FOLLOW at the top of the acknowledgement message reminds the flight crew.

L2 *The message status changes to ACK, on a green background.*

L1 CLOSE....................SELECT See (3)

Closing the message clears the screen.



1833Z FROM EGGX CTL OPEN
OCEANIC CLEARANCE No176
1833Z 25 JUN 2000
FROM: EGGX
AIB 006
CLRD TO: KJFK
*REFUSE
<OTHER PGE 1 / 2 ACK*

1833Z FROM EGGX CTL ACK
OCEANIC CLEARANCE No176
1833Z 25 JUN 2000
FROM: EGGX
AIB 006
CLRD TO: KJFK
*CANCEL
<OTHER PGE 1 / 2 SEND*

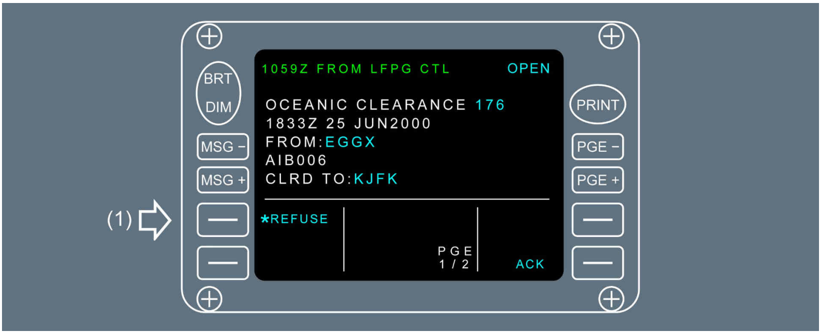
1833Z FROM EGGX CTL ACK
CONFIRMATION WILL FOLLOW
OCEANIC CLEARANCE No176
1833Z 25 JUN 2000
FROM: EGGX
SENT
<OTHER PGE 1 / 2 CLOSE*

REFUSE

On the DCDU:

REFUSE.. SELECT See (1)

Datalink cannot send a refuse message. The flight crew must report the clearance refusal to the ATC by voice.


1059Z FROM LFPG CTL OPEN

OCEANIC CLEARANCE 176
1833Z 25 JUN2000
FROM:EGGX
AIB006
CLRD TO:KJFK
(1)
BRT
DIM
MSG -
MSG +
PRINT
PGE -
PGE +
*REFUSE
PGE
1 / 2
ACK

- **On the RMP:**

  The crew must contact the ATC by voice.

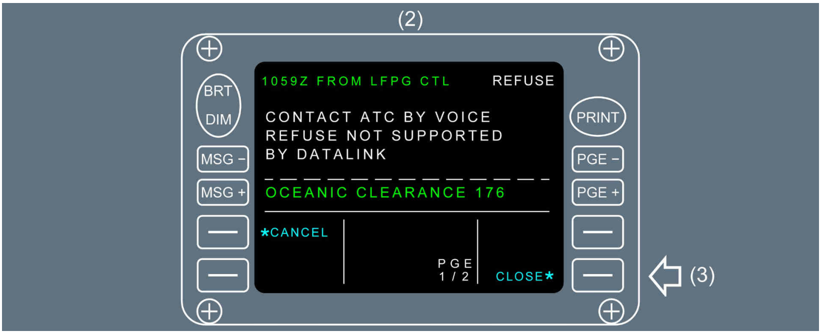
  The refusal of oceanic clearance cannot be sent via datalink. CONTACT ATC BY VOICE appears on the DCDU See (2) .

- **On the DCDU:**

  CLOSE..SELECT See (3)

  Closing the message clears the screen.

(2)


1059Z FROM LFPG CTL REFUSE

CONTACT ATC BY VOICE
REFUSE NOT SUPPORTED
BY DATALINK

OCEANIC CLEARANCE 176
BRT
DIM
MSG -
MSG +
PRINT
PGE -
PGE +
*CANCEL
PGE
1 / 2
CLOSE*
(3)

Ident.: DSC-46-10-50-40-00021064.0001001 / 21 MAR 17

OCL READ-BACK CONFIRMATION

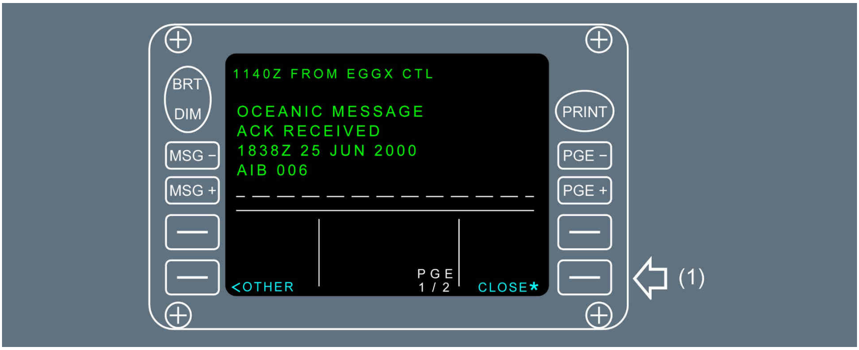
- **On the glareshield:**

  ATC MSG pb..PRESS

  The aural and visual alerts stop.

Note: *When a read-back confirmation is received, the flight crew can proceed, in accordance with the clearance displayed on the DCDU.*
The flight crew must update the flight plan if necessary.

- **On the DCDU:**
  CLOSE.. SELECT See (1)
  The message is automatically stored.



```
1140Z FROM EGGX CTL

OCEANIC MESSAGE
ACK RECEIVED
1838Z 25 JUN 2000
AIB 006
```

HOW TO OBTAIN D-ATIS

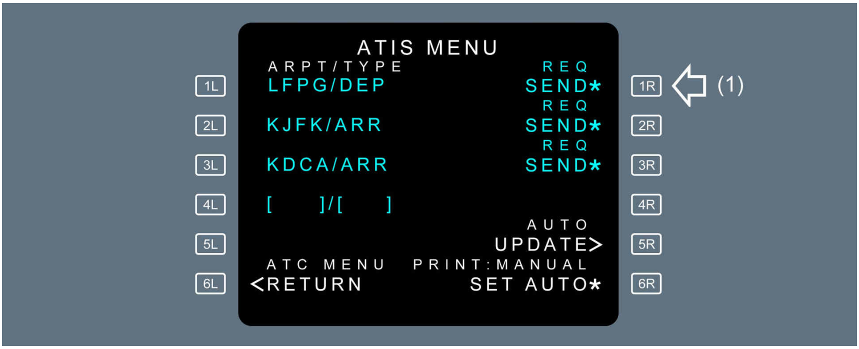
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Ident.: DSC-46-10-50-50-00021065.0001001 / 21 MAR 17

ATIS MANUAL REQUEST

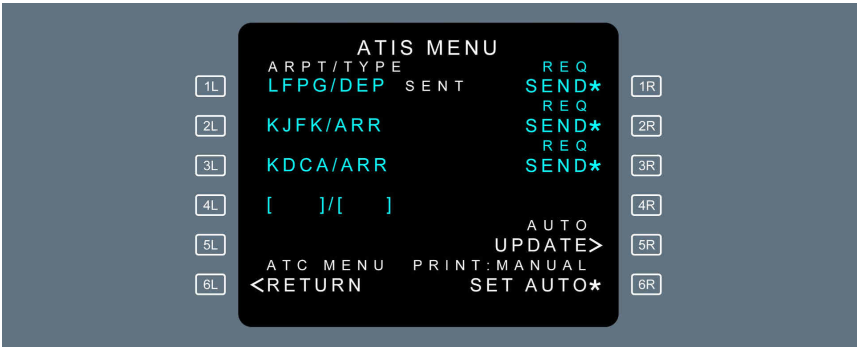
- **On the MCDU:**
  ATIS MENU Page:

  REQ SEND.. SELECT See (1)
  The flight crew sends manually the ATIS request to the desired departure or arrival airport.



```
              ATIS MENU
ARPT/TYPE                     REQ
LFPG/DEP                    SEND*
                              REQ
KJFK/ARR                    SEND*
                              REQ
KDCA/ARR                    SEND*

[    ]/[    ]
                             AUTO
                          UPDATE>
ATC MENU          PRINT:MANUAL
<RETURN                SET AUTO*
```

SENT Indication on the ATIS MENU Page of the MCDU



```
              ATIS MENU
ARPT/TYPE                     REQ
LFPG/DEP  SENT              SEND*
                              REQ
KJFK/ARR                    SEND*
                              REQ
KDCA/ARR                    SEND*

[    ]/[    ]
                             AUTO
                          UPDATE>
ATC MENU          PRINT:MANUAL
<RETURN                SET AUTO*
```

Ident.: DSC-46-10-50-50-00021066.0001001 / 21 MAR 17

ATIS AUTO-UPDATE REQUEST

- **On the MCDU:**

  ATIS MENU Page:

  AUTO UPDATE..........SELECT See (1)

  The ATIS AUTO UPDATE page displays a list of arrival airports (See (2)).

  SET ON..........SELECT See (3)

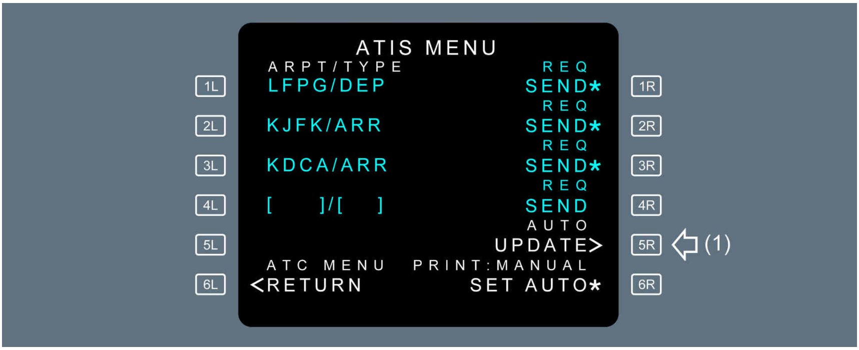
  The auto-update request must be sent to the ground via the ATIS MENU page.
  Each arrival airport may be set on individually.

  ATIS MENU RETURN..........SELECT See (4)

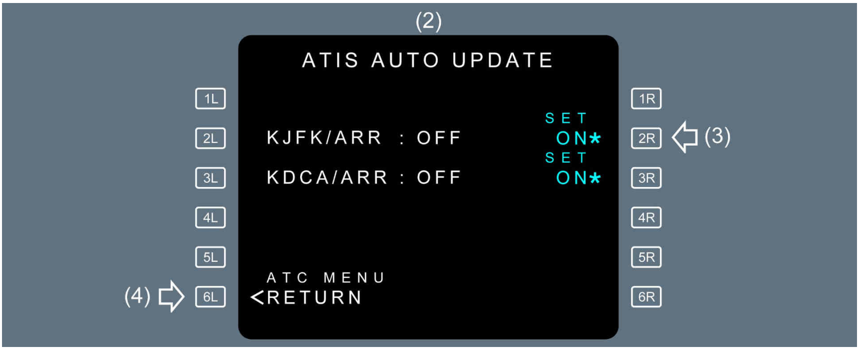
  RETURN enables to display the ATIS MENU Page (See (5)).

UPDATE SEND..SELECT See (6)

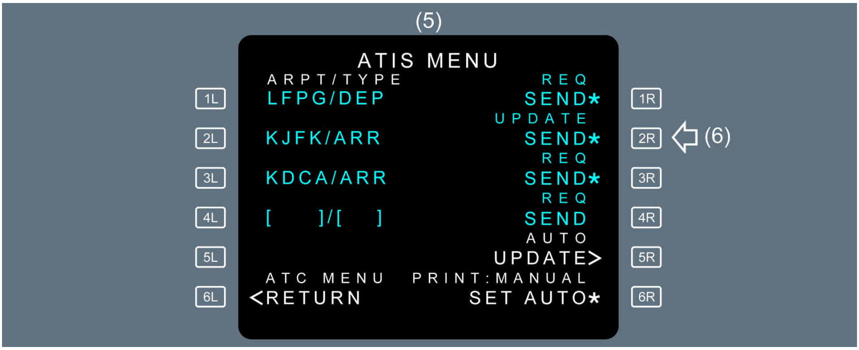
The ATIS is automatically sent to the aircraft, when ATIS information is updated.


1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
(1)

```
         ATIS MENU
ARPT/TYPE                REQ
LFPG/DEP               SEND*
                         REQ
KJFK/ARR               SEND*
                         REQ
KDCA/ARR               SEND*
                         REQ
[    ]/[    ]           SEND
                        AUTO
                     UPDATE>
ATC MENU      PRINT:MANUAL
<RETURN            SET AUTO*
```


(2)
1L
2L
3L
4L
5L
6L
(4)
1R
2R
3R
4R
5R
6R
(3)

```
      ATIS AUTO UPDATE

                         SET
KJFK/ARR  : OFF          ON*
                         SET
KDCA/ARR  : OFF          ON*



ATC MENU
<RETURN
```

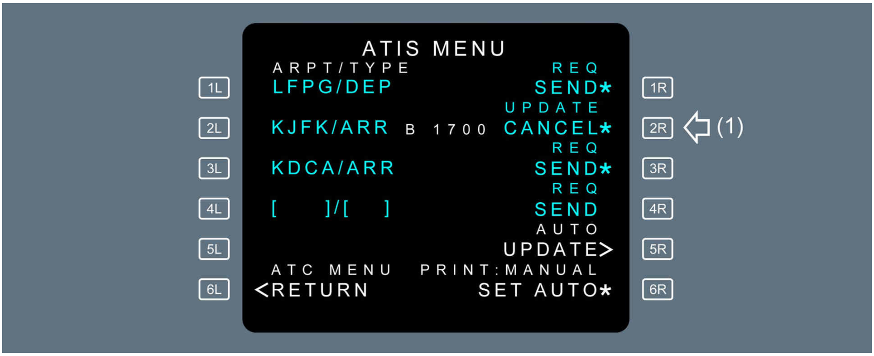

(5)
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
(6)

```
         ATIS MENU
ARPT/TYPE                REQ
LFPG/DEP               SEND*
                      UPDATE
KJFK/ARR               SEND*
                         REQ
KDCA/ARR               SEND*
                         REQ
[    ]/[    ]           SEND
                        AUTO
                     UPDATE>
ATC MENU      PRINT:MANUAL
<RETURN            SET AUTO*
```

AUTO-UPDATE CANCEL

UPDATE CANCEL..SELECT See (1)

Once the auto-update function is cancelled, REQ SEND function of the arrival airport becomes available again. The flight crew can send ATIS information requests manually.


ATIS MENU
ARPT/TYPE
LFPG/DEP
REQ
SEND*
KJFK/ARR B 1700
UPDATE
CANCEL*
KDCA/ARR
REQ
SEND*
[ ]/[ ]
REQ
SEND
AUTO
UPDATE>
ATC MENU
<RETURN
PRINT:MANUAL
SET AUTO*
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
(1)

Ident.: DSC-46-10-50-50-00021067.0001001 / 21 MAR 17

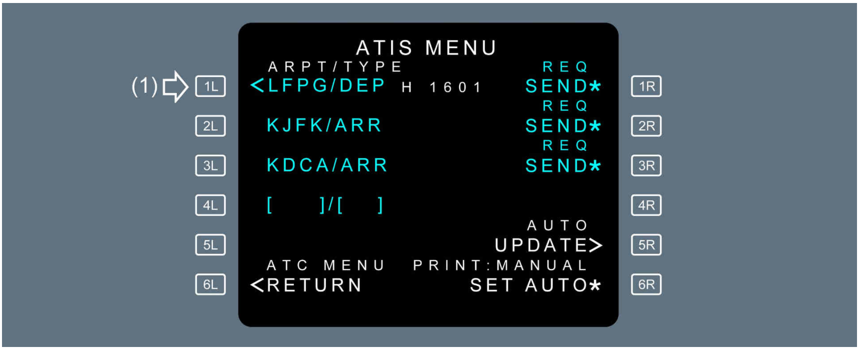
ATIS RECEPTION

- **On the MCDU:**

  ATIS MENU Page:

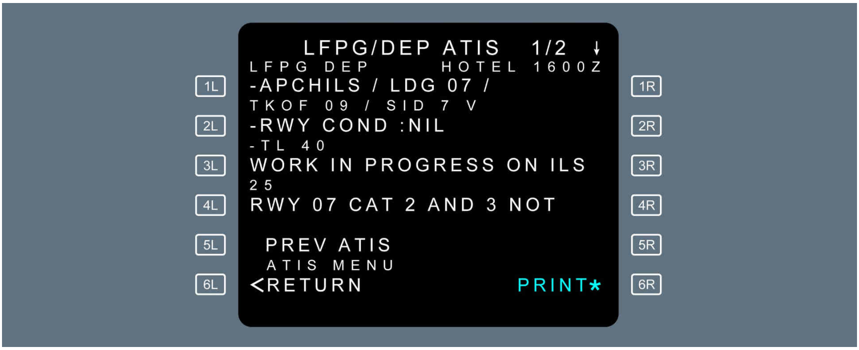
  ARPT/TYPE..SELECT See (1)

  The MCDU displays the text of the selected ATIS report.


ATIS MENU
ARPT/TYPE
<LFPG/DEP H 1601
REQ
SEND*
KJFK/ARR
REQ
SEND*
KDCA/ARR
REQ
SEND*
[ ]/[ ]
AUTO
UPDATE>
ATC MENU
<RETURN
PRINT:MANUAL
SET AUTO*
(1)
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Note: *The ATIS code and time of reception appear next to the corresponding airport code.*

ATIS Report Page 1/2 Displayed on the DCDU



```
  LFPG/DEP ATIS   1/2 ↓
LFPG DEP       HOTEL 1600Z
-APCHILS / LDG 07 /
TKOF 09 / SID 7 V
-RWY COND :NIL
-TL 40
WORK IN PROGRESS ON ILS
25
RWY 07 CAT 2 AND 3 NOT

  PREV ATIS
  ATIS MENU
<RETURN            PRINT*
```

HOW TO SEND EMER MSG

Ident.: DSC-46-10-50-00021068.0001001 / 21 MAR 17
Applicable to: ALL

EXAMPLE OF PANPAN MESSAGE

- **On the MCDU:**

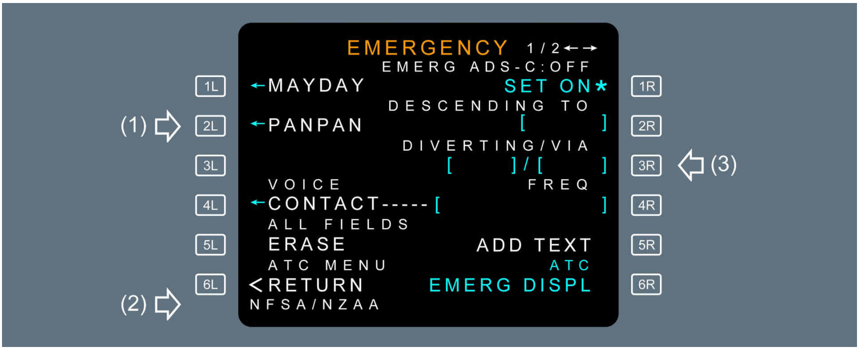
  EMERGENCY Page 1/2:

  PANPAN..SELECT See (1)

  L2 *PANPAN becomes blue.*

  L1 DIVERTING/VIA field (3).............................INSERT See (2) to See (3)

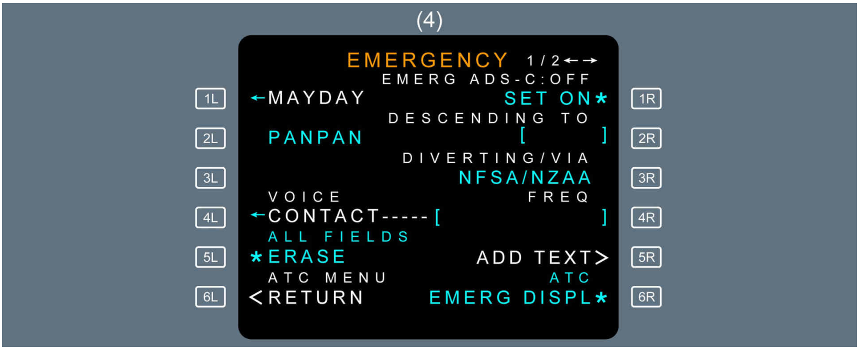
  The VIA field is filled by default with the entered DIVERTING data, if the VIA field is not manually entered.



```
       EMERGENCY  1/2←→
      EMERG ADS-C:OFF
←MAYDAY          SET ON*
      DESCENDING TO
←PANPAN          [     ]
      DIVERTING/VIA
        [     ]/[      ]
  VOICE             FREQ
←CONTACT-----[          ]
  ALL FIELDS
  ERASE          ADD TEXT
  ATC MENU            ATC
<RETURN       EMERG DISPL
NFSA/NZAA
```

L2

The EMERGENCY Page 1/2 will display the activation of PANPAN See (4):



```
EMERGENCY  1/2←→
        EMERG ADS-C:OFF
←MAYDAY          SET ON*
          DESCENDING TO
 PANPAN          [     ]
            DIVERTING/VIA
              NFSA/NZAA
 VOICE                FREQ
←CONTACT-----[          ]
 ALL FIELDS
*ERASE          ADD TEXT>
 ATC MENU              ATC
<RETURN      EMERG DISPL*
```

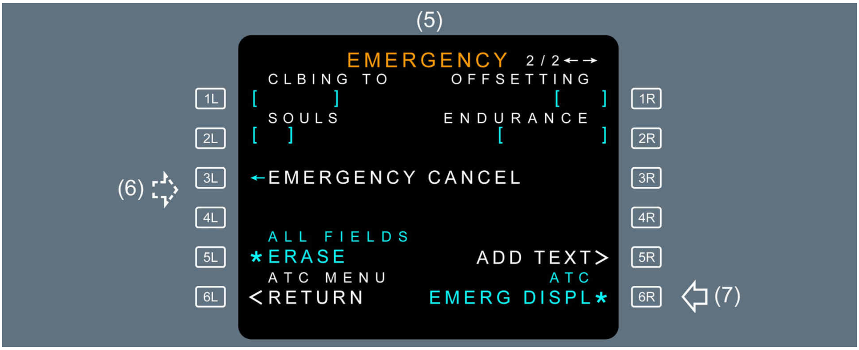
L1

<u>EMERGENCY Page 2/2</u>:

<u>Note:</u> *The emergency can be cancelled by selecting the EMERGENCY CANCEL See (6) on the EMERGENCY page 2/2 See (5).*

ATC EMERG DISPL.. SELECT See (7)

The DCDU displays the message See (8).



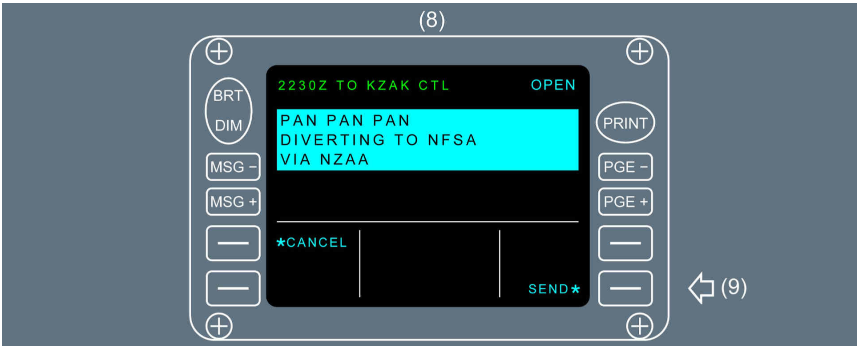
```
EMERGENCY  2/2←→
 CLBING TO     OFFSETTING
[        ]         [    ]
 SOULS          ENDURANCE
[   ]          [        ]

←EMERGENCY CANCEL


 ALL FIELDS
*ERASE          ADD TEXT>
 ATC MENU              ATC
<RETURN      EMERG DISPL*
```

- **On the DCDU:**

SEND*.. SELECT See (9)

The flight crew sends the emergency message via DCDU.

The flight crew can close the emergency message, if the message is not closed automatically.



```
2230Z TO KZAK CTL                OPEN
PAN PAN PAN
DIVERTING TO NFSA
VIA NZAA

*CANCEL
                                SEND*
```

HOW TO MODIFY FLT PLAN

Ident.: DSC-46-10-50-00021069.0001001 / 21 MAR 17
Applicable to: ALL

- **When the scratchpad (1) displays the AOC SEC F-PLN UPLINK message:**
  - **On the MCDU:**

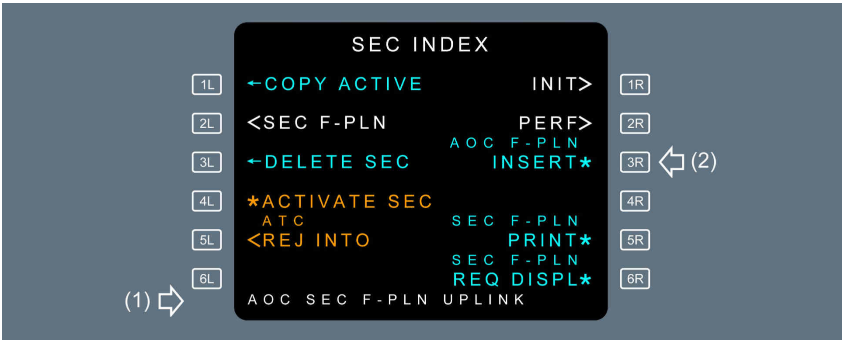
    SEC INDEX Page:

    AOC F-PLN INSERT...SELECT See (2)

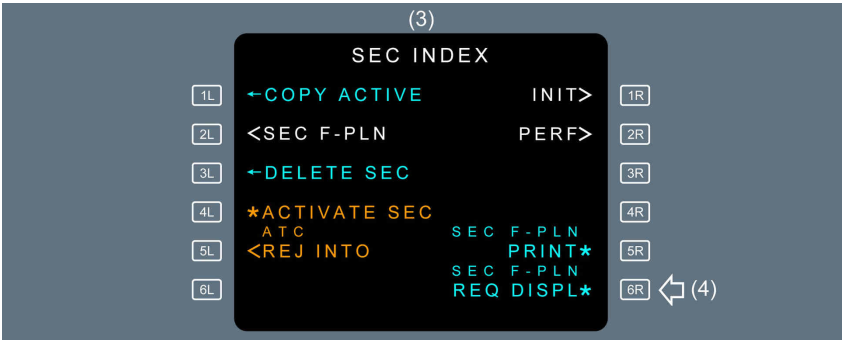
    The flight plan is inserted in the secondary F-PLN See (3) .
    The flight can review and modify the flight plan.

    SEC F-PLN REQ DISPLAY...SELECT See (4)

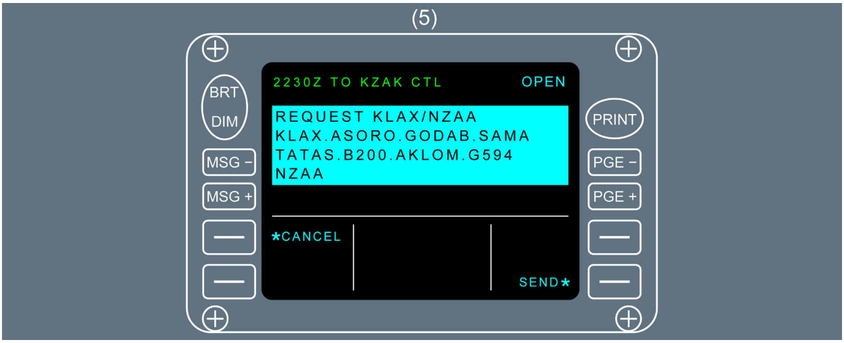
L2 *The DCDU automatically displays a datalink message See (5) .*
L1 *The flight crew sends the message to the ATC from the DCDU.*



```
           SEC INDEX
←COPY ACTIVE              INIT>
<SEC F-PLN                PERF>
                     AOC F-PLN
←DELETE SEC            INSERT*
*ACTIVATE SEC
 ATC                 SEC F-PLN
<REJ INTO               PRINT*
                     SEC F-PLN
                     REQ DISPL*
AOC SEC F-PLN UPLINK
```



SEC INDEX
←COPY ACTIVE INIT>
<SEC F-PLN PERF>
←DELETE SEC
*ACTIVATE SEC
ATC SEC F-PLN
<REJ INTO PRINT*
SEC F-PLN
REQ DISPL*



2230Z TO KZAK CTL OPEN
REQUEST KLAX/NZAA
KLAX.ASORO.GODAB.SAMA
TATAS.B200.AKLOM.G594
NZAA
*CANCEL
SEND*

- **When ATC clearance is received:**
  - **On the glareshield:**

    ATC MSG pb..PRESS

    The aural and visual alerts stop.
  - **On the DCDU:**

    STBY..SELECT See (1)

    L2 *The message status changes to STBY on a blue background See (2) .*

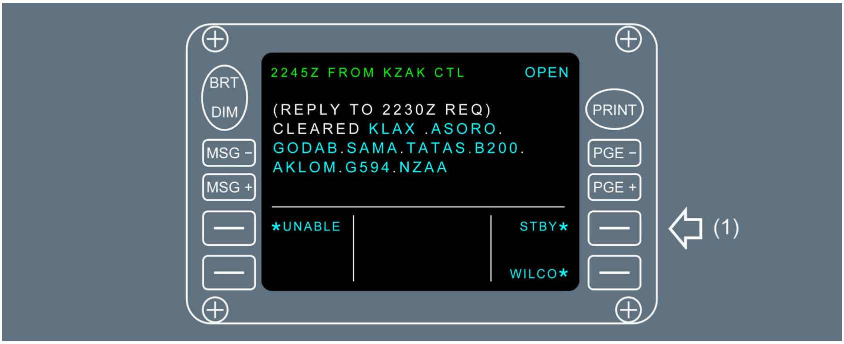
    L1 SEND..SELECT See (3)

    L2 *The background color of the STBY message status changes to green.*

    L1 LOAD..SELECT See (4)

    LOAD must be selected. Other selection may prevent loading of the clearance.
    The LOAD SEC OK displays in the information field of the DCDU, if loading is successful.
    L2 *The flight crew can review the clearance on the MCDU, in SEC F-PLN pages.*

L1

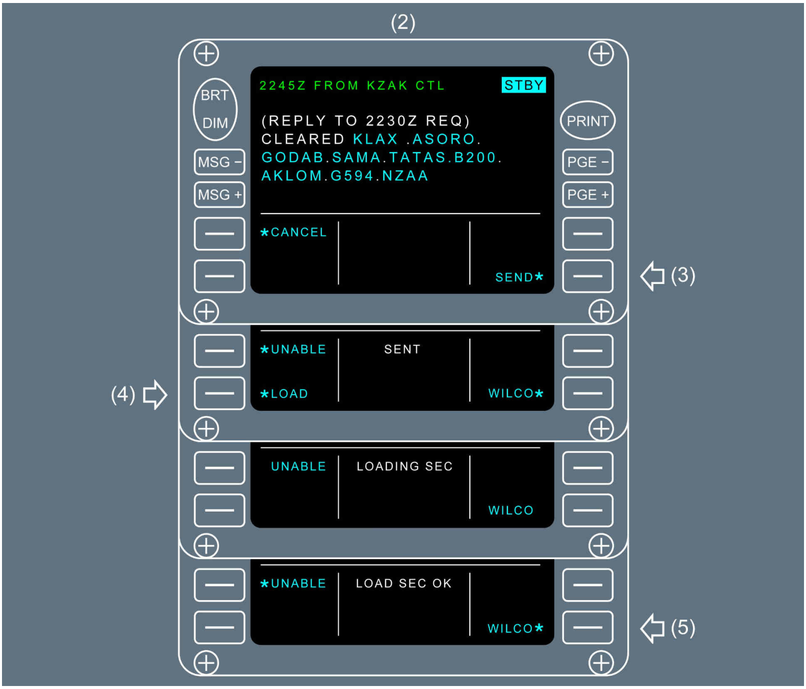


2245Z FROM KZAK CTL OPEN
(REPLY TO 2230Z REQ)
CLEARED KLAX .ASORO.
GODAB.SAMA.TATAS.B200.
AKLOM.G594.NZAA
UNABLE STBY
WILCO*

- **If the flight crew accepts the clearance:**

  WILCO.....SELECT See (5)

  The flight crew can activate the secondary F-PLN.



2245Z FROM KZAK CTL STBY
(REPLY TO 2230Z REQ)
CLEARED KLAX .ASORO.
GODAB.SAMA.TATAS.B200.
AKLOM.G594.NZAA
*CANCEL
SEND*

*UNABLE SENT
LOAD WILCO

UNABLE LOADING SEC
WILCO

*UNABLE LOAD SEC OK
WILCO*

■ If the flight crew decides to modify the clearance:

- The flight crew loads the clearance into the SEC F-PLN, on the MCDU and modifies it.
- The flight crew rejects the clearance by selecting UNABLE on the DCDU.
- The flight crew sends a new request (with the modified F-PLN) to the ATC.

ATC MSG RECORD NOT RELIABLE - DISPLAYED AT ATSU POWER-UP

Ident.: DSC-46-10-100-00024089.0001001 / 28 MAY 20
Applicable to: ALL

DESCRIPTION

In some specific cases, such as ATSU power-up, the flight crew may experience the following:

- ATC MSG RECORD NOT RELIABLE DCDU message
- MSG RECORD NOT RELIABLE MCDU scratchpad message when the flight crew selects the MSG RECORD menu on the MCDU.

The flight crew may experience this abnormal behavior if, before the previous ATSU power-off, two CPDLC messages with the same time stamp were stored in the MSG RECORD.
At the next ATSU power-up, the MSG RECORD is emptied and the subsequent CPDLC messages are not stored in the MSG RECORD.

OPERATIONAL RECOMMENDATION

In such situation, the flight crew should perform a manual reset of the ATSU in order to recover the nominal ATSU behavior.*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*.

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INTRODUCTION

Ident.: DSC-46-20-00015782.0001001 / 05 JAN 15
Applicable to: LV-FVH, LV-FVI, LV-KAN, LV-KAO

The Aircraft Information Network System (AINS) is part of FlySmart with Airbus. FlySmart with Airbus is made up of the following systems:
- The AINS
- Two Onboard Information Terminal ◁ (OIT).

FlySmart with Airbus is an Airbus solution for EFB operations.

The AINS consists of an integrated avionics file server providing a host-platform for maintenance and operations applications, a secured interface to the avionics and a communication link between the aircraft Ethernet Local Area Network (ELAN) and the airline ground-based information system. This system acquires, stores, processes, and transmits data from the avionics to the:
- Flight crew, to accomplish performance calculations, consult documentation...
- Airline network via the Gatelink
- Maintenance operator, for fast and efficient troubleshooting.

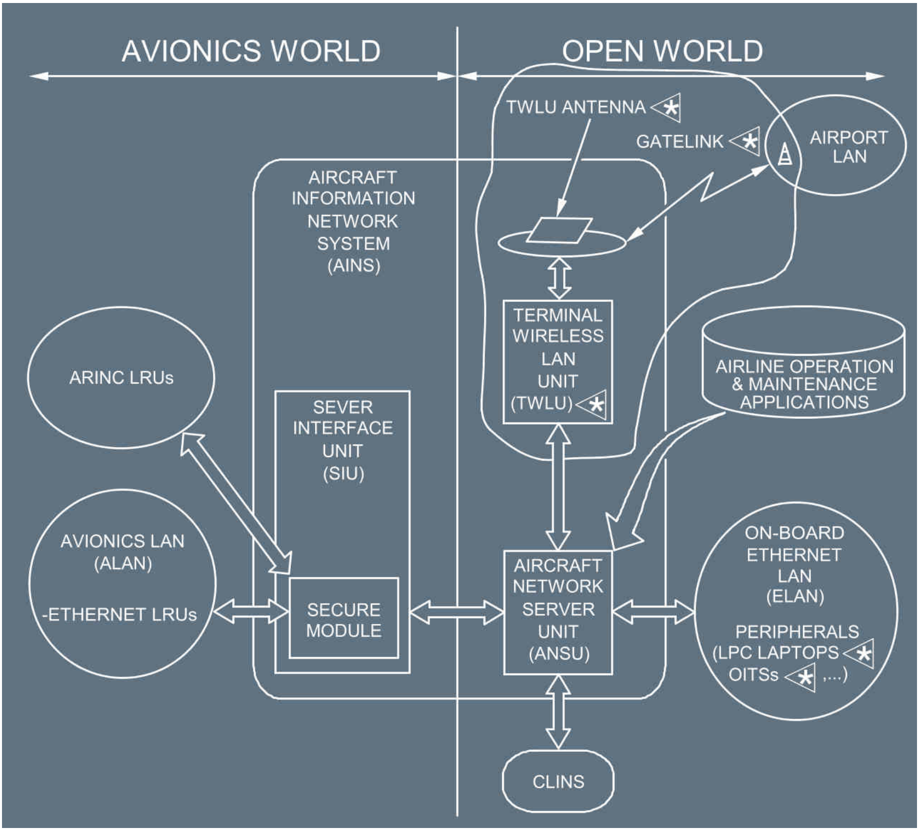
AINS maintenance and operations applications are installed by the airline, under its own responsibility. Due to the highly customized programming, AINS functions may vary for different airlines and are, therefore, not described in detail.

SYSTEM DESCRIPTION

Ident.: DSC-46-20-00015783.0001001 / 05 JAN 15
Applicable to: LV-FVH, LV-FVI, LV-KAN, LV-KAO

The AINS is capable of receiving or sending information from/to the aircraft's Line Replaceable Units (LRU).

The different parts of this system are considered to belong to one of the two following worlds:
- An “open world”, since its elements are open to the outside, and use commercial off-the-shelf software products with high updating possibilities, etc.
- The “avionics world”, which is protected by a secure module.


AVIONICS WORLD
OPEN WORLD
TWLU ANTENNA ◁
GATELINK ◁
AIRPORT LAN
AIRCRAFT INFORMATION NETWORK SYSTEM (AINS)
TERMINAL WIRELESS LAN UNIT (TWLU) ◁
AIRLINE OPERATION & MAINTENANCE APPLICATIONS
ARINC LRUs
SEVER INTERFACE UNIT (SIU)
AVIONICS LAN (ALAN)
-ETHERNET LRUs
SECURE MODULE
AIRCRAFT NETWORK SERVER UNIT (ANSU)
ON-BOARD ETHERNET LAN (ELAN)
PERIPHERALS (LPC LAPTOPS ◁ OITSs ◁ ,...)
CLINS

The AINS consists of:

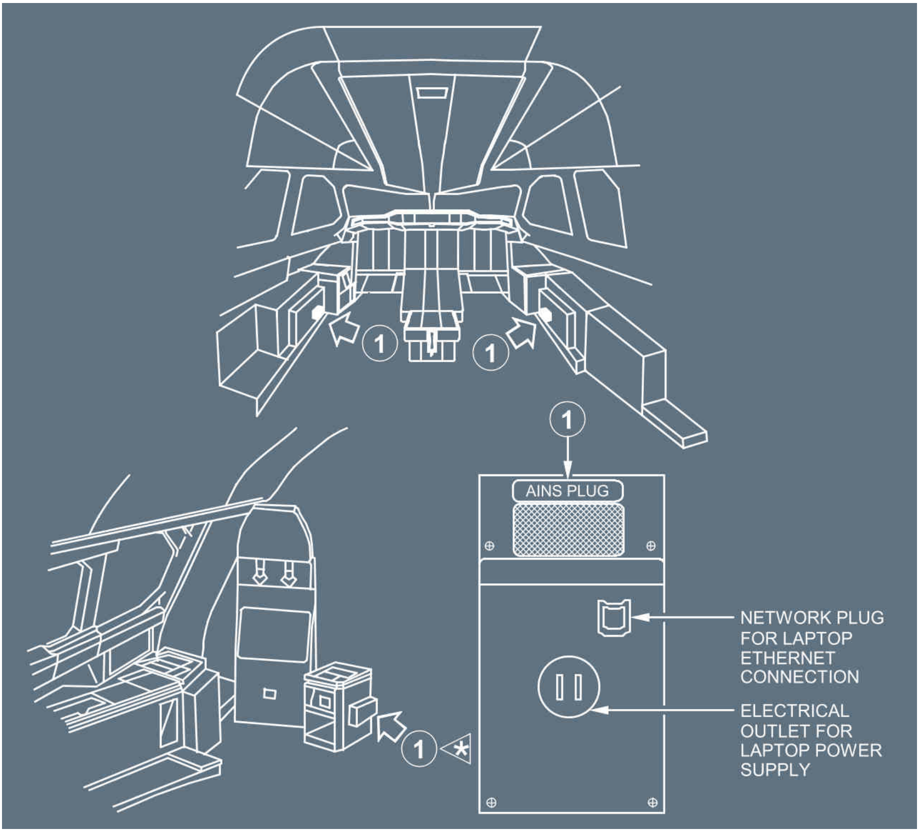
- An Aircraft Network Server Unit (ANSU): To provide powerful server and data management functions onboard the aircraft.
- A Server Interface Unit (SIU):To protect avionics from pollution from the open world, providing isolation between avionics and open networks.
- A Terminal Wireless LAN Unit ◁ (TWLU) and TWLU antenna ◁ : To provide wireless connection between the AINS and Airport Local Area Network (LAN).

Note: Through the GATELINK pb-sw ◁ , on the overhead panel, TWLU ◁ and TWLU antenna ◁ provide on-ground wireless connection between the AINS and Airport LAN.

COCKPIT ARRANGEMENT

Ident.: DSC-46-20-00015784.0001001 / 05 JAN 15
Applicable to: LV-FVH, LV-FVI, LV-KAN, LV-KAO

In the cockpit, the AINS can interface with laptops and printers via the:
- Captain's AINS plug
- First Officer's AINS plug
- Third Occupant's AINS plug ◁✱


1
1
1
AINS PLUG
NETWORK PLUG FOR LAPTOP ETHERNET CONNECTION
ELECTRICAL OUTLET FOR LAPTOP POWER SUPPLY
1 ◁✱

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INTRODUCTION

Ident.: DSC-46-40-00021021.0001001 / 04 JUN 19
Applicable to: ALL

The FlySmart with Airbus application suite is composed of:
- Takeoff application
- Landing application
- In-flight application
- Loadsheet application
- Operational Documentation application (OLB)
- Electronic QRH application (eQRH)
- Manager application (available for iPad version)

The FlySmart with Airbus application suite is designed to:
- Improve access to flight crew's operational information
- Reduce the quantity of paper documents in the cockpit by replacing them with electronic documents
- Enable reduced revision and distribution cycles to ensure better technical data accuracy
- Ease and improve the operational data updating process
- Provide an accurate and optimized computation of performance.

The FlySmart with Airbus application suite can be used by the flight crew on a Portable Equipment Device (PED).
The flight crew can use the power outlet ◁ (110 VAC / 60 Hz) installed on the lateral console to plug their PED.

Note: *The power outlets (115 VAC / 400 Hz) located on the rear of the cockpit are for maintenance use only.*

GENERAL

Ident.: DSC-46-40-00021022.0001001 / 22 MAR 17
Applicable to: ALL

The My Flight page enables:
- To check that FlySmart with Airbus applications are up to date. The My Flight page provides the version of the installed applications and data (EFB version)
- To start the Manager application, that enables to update the operational data (performance, manuals)
- To initialize the applications with the applicable aircraft tail number, flight number and citypair. This avoids multiple entries of the same data in the different applications.

There is one My Flight page per application. All the inputs that the user has entered on one My Flight page are retrieved by the other applications.

Note: *On the My Flight page of OLB application, the user can only enter the a/c type and a/c registration.*

LANDING APPLICATION

Ident.: DSC-46-40-00021023.0001001 / 22 MAR 17
Applicable to: ALL

The Landing application aims at computing the landing performance data (maximum landing weight, approach speed) according to the aircraft configuration and external conditions (runway, surrounding obstacles, weather).
The Landing application allows straightforward computations and provides the optimized landing performance for the given conditions.

TAKEOFF APPLICATION

Ident.: DSC-46-40-00021025.0001001 / 22 MAR 17
Applicable to: ALL

The Takeoff application aims at computing the takeoff performance data (maximum takeoff weight, takeoff speeds, flexible temperature) according to the aircraft configuration and external conditions (runway, surrounding obstacles, weather).
The Takeoff application allows straightforward computations and provides the optimized takeoff performance for the given conditions.

IN-FLIGHT APPLICATION

Ident.: DSC-46-40-00023627.0001001 / 04 JUN 19
Applicable to: ALL

The In-flight application aims at computing the in-flight performance data (time, fuel consumption, distance, altitude) according to the aircraft configuration and external conditions (weather).
The In-flight application allows straightforward computations and provides the optimized in-flight performance for the given conditions.

LOADSHEET APPLICATION

Ident.: DSC-46-40-00021026.0001001 / 22 MAR 17
Applicable to: ALL

The Loadsheet application allows the flight crew users to prepare the aircraft loading and to check that all weights and CG remain within the loading operational envelope. This eases the computation of the ZFWCG, ZFW, TOW and TOCG, and enables last–minute changes to the passenger/cargo/fuel distribution.

Depending on airline’s authority requirements, the Loadsheet application can also generate a load and trim sheet.

OPS LIBRARY APPLICATION

Ident.: DSC-46-40-00021027.0001001 / 22 MAR 17
Applicable to: ALL

The OLB application enables the onboard consultation of any flight operations document published in the relevant format (e.g. airline's manuals), including the ones delivered by Airbus (FCOM, MEL, AFM, CDL, FCTM).
MEL and CDL items (including missing items) selected on OLB application are automatically transferred to Takeoff and Landing applications.

ELECTRONIC QRH APPLICATION

Ident.: DSC-46-40-00021145.0001001 / 04 JUN 19
Applicable to: ALL

The electronic QRH application (eQRH) is an application that enables the flight crew to:
- Manage the Normal Checklists and some Abnormal Procedures
- Access to some important operational data that may be required during the flight (such as the OEBs).

MANAGER APPLICATION

Ident.: DSC-46-40-00021028.0001001 / 22 MAR 17
Applicable to: ALL

The Manager application aims at updating on the iPad the operational data used by FlySmart with Airbus applications for iPad: performance data and operational manuals.

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AIRCRAFT SYSTEMS

APU

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DSC-49-10 Description

DSC-49-10-10 General

General....A

DSC-49-10-20 Main Components

APU Engine....A
Electronic Control Box....B
Air Intake System....C
Starter....D
Fuel System....E
Oil System....F
Inlet Guide Vanes (IGV)....G
Air Bleed System....H
Controls....I
Ground Operations Safety Devices....J
Operation Under Failure Conditions....K

DSC-49-20 Controls and Indicators

Overhead Panel....A
External Controls....B
ECAM - APU SD Page....C
Memo Display....D

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GENERAL

Ident.: DSC-49-10-10-00000941.0001001 / 21 MAR 17
Applicable to: ALL

The Auxiliary Power Unit (APU) is a self contained unit which makes the aircraft independent of external pneumatic and electrical power supply.

On ground

- It supplies bleed air for starting the engine and for the air conditioning system.
- It supplies electrical power to the electrical system.

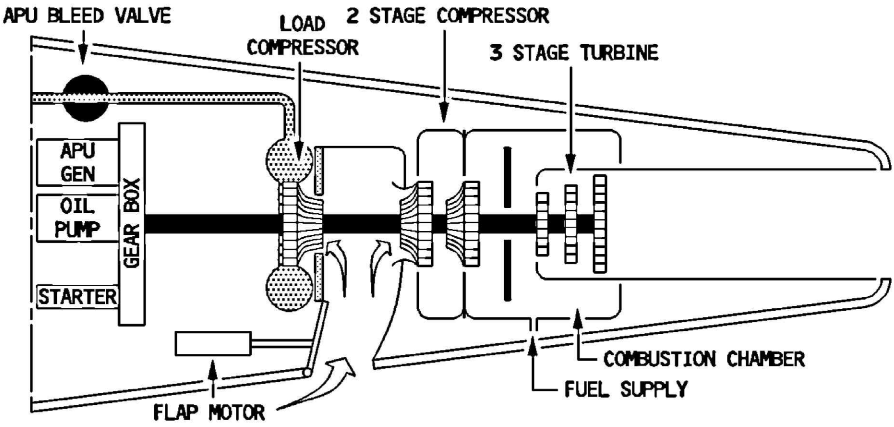
During Take-Off

- It supplies bleed air for air conditioning, thus avoiding a reduction in engine thrust caused by the use of engine bleed air for this purpose, when optimum aircraft performance is required.

In Flight

- It backs up the Electrical system
- It backs up the Air conditioning
- It can be used to start the engines

The APU may obtain power for starting from the batteries specifically assigned to the APU, or in combination with the external power, or normal aircraft supply.
APU start is permitted throughout the normal flight envelope, except when APU battery only is supplying (*Refer to LIM-APU Operational Envelope*).
The ECAM displays APU parameters.


APU BLEED VALVE
LOAD COMPRESSOR
2 STAGE COMPRESSOR
3 STAGE TURBINE
APU GEN
OIL PUMP
GEAR BOX
STARTER
COMBUSTION CHAMBER
FUEL SUPPLY
FLAP MOTOR

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APU ENGINE

Ident.: DSC-49-10-20-00000943.0001001 / 16 MAR 11
Applicable to: ALL

The basic element of the APU is a single shaft gas turbine which delivers mechanical shaft power for driving the accessory gearbox (electrical generator) and produces bleed air (engine starting and pneumatic supply).

ELECTRONIC CONTROL BOX

Ident.: DSC-49-10-20-00000944.0002001 / 16 MAR 11
Applicable to: ALL

The Electronic Control Box (ECB) is primarily a full authority digital electronic controller that performs the APU system logic for all modes of APU operation such as :
- Sequence the start and monitors it
- Monitors speed and temperature
- Monitors bleed air (IGV)
- Sequence the shut down (manual, protective or inhibited)

AIR INTAKE SYSTEM

Ident.: DSC-49-10-20-00000945.0001001 / 16 MAR 11
Applicable to: ALL

The air intake and an electrically operated flap allow the external air to reach the compressor inlet.

STARTER

Ident.: DSC-49-10-20-00000946.0001001 / 16 MAR 11
Applicable to: ALL

The ECB controls the electric starter. The starter engages if the air intake is fully open and provided the MASTER SW and the START pushbutton are ON.

FUEL SYSTEM

Ident.: DSC-49-10-20-00000947.0001001 / 04 JUN 19
Applicable to: ALL

The APU is supplied with fuel through the trim tank transfer line.
The ECB controls the fuel flow.

Note: *The APU fuel feed line is pressurized when the APU MASTER pb-sw is set to ON. If the initial start attempt fails, the crew may wait 3 min before setting the APU START pb-sw to ON again. This delay ensures the APU fuel feed line is sufficiently pressurized.*

OIL SYSTEM

Ident.: DSC-49-10-20-00000948.0001001 / 16 MAR 11
Applicable to: ALL

The APU has an integral independent lubrication system (for lubrication and cooling).

INLET GUIDE VANES (IGV)

Ident.: DSC-49-10-20-00000949.0001001 / 16 MAR 11
Applicable to: ALL

The IGVs control bleed air flow, and a fuel-pressure-powered actuator positions the IGVs.
The ECB controls the actuator in response to aircraft demand.

AIR BLEED SYSTEM

Ident.: DSC-49-10-20-00000950.0002001 / 10 JAN 11
Applicable to: ALL

The ECB controls the APU BLEED valves. If APU BLEED is set to ON, the bleed valve closes at 25 000 ft when climbing, and reopens at 23 000 ft when descending.

CONTROLS

Ident.: DSC-49-10-20-00000952.0001001 / 16 MAR 11
Applicable to: ALL

The flight crew uses the controls on the APU panel for routine shutdown. For emergency shutdown :
- The flight crew can push the APU FIRE handle, or
- The ground crew can push the APU SHUT OFF pushbutton on the interphone panel under the nose fuselage, or the APU EMER SHUT DOWN pushbutton on the refueling/defueling panel.

GROUND OPERATIONS SAFETY DEVICES

Ident.: DSC-49-10-20-00000953.0001001 / 16 MAR 11
Applicable to: ALL

APU FIRE WITH AUTOMATIC SHUTDOWN

The APU may run, without cockpit crew supervision, when the aircraft is on ground. In case of fire in the APU compartment :
- APU fire warnings operate in the cockpit
- A horn in the nose gear bay sounds
- The “AVAIL” light goes off
- The “FAULT“ light in the MASTER SW comes on

- The APU shuts down
- The APU fire extinguisher discharges.

Note: *On ground, the No Break Power Transfer (NBPT) function is inhibited, in the following cases of APU shutdown :*
- *The APU is shut down, by using the APU SHUT OFF switch on the external power panel (925 VU).*
- *An APU emergency shutdown is triggered, by using the APU EMER SHUT DOWN switch on the REFUEL/DEFUEL panel (990 VU).*
- *An automatic APU shutdown is triggered by the ECB.*
- *The APU is shut down, by using the APU FIRE pushbutton.*

OPERATION UNDER FAILURE CONDITIONS

Ident.: DSC-49-10-20-00000954.0001001 / 16 MAR 11
Applicable to: ALL

APU FAULT WITH AUTOMATIC SHUTDOWN

The following failures cause an automatic shutdown :
1. Overspeed
2. Certain critical ECB internal failures
3. Underspeed
4. Start abort
5. Low oil pressure
6. High oil temperature
7. Load compressor overtemperature
8. Generator high oil temperature
9. DC power interrupt (BAT OFF, when aircraft on batteries only)
10. Overtemperature
11. Certain ECB internal failures

Failure causes 1 and 2 lead to an automatic shutdown (protective shutdown) in all flight phases. For failures 3 through 11, the automatic shutdown is inhibited to ensure APU availability (inhibited shutdown in flight phase 2 to 9).

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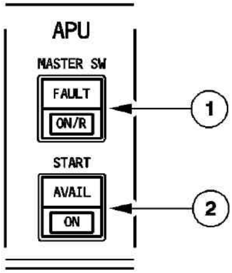
OVERHEAD PANEL

Applicable to: ALL

Ident.: DSC-49-20-A-00017859.0001001 / 21 MAR 16



Ident.: DSC-49-20-A-00017861.0004001 / 21 MAR 16

(1) APU MASTER SW pb-sw

This pushbutton controls the electric supply for APU operation, and its protective features. It also controls the start and shutdown sequences

FAULT lt : This amber FAULT light comes on, and a caution appears on the ECAM, when an automatic APU shutdown occurs (*Refer to DSC-49-10-20 Ground Operations Safety Devices*).

Note: *In case of automatic, non emergency shutdown, the air inlet flap closes 15 min after the APU speed is lower than 7 %.*
If an automatic, non-emergency shutdown happens on ground, the 15 min countdown starts after liftoff.

ON/R :
- The blue ON light comes on.
- Electric power goes to the APU system, and the ECB performs a power-up test.
- The APU air-intake flap opens.
- The APU fuel isolation valve and APU LP valve open.
- The FWD APU and aft APU fuel pumps operate during the trim tank fuel transfer, and depending on the pressure in the trim tank line.
- If the aircraft has ground power or main generator power, the APU page appears on the ECAM display.

Off : Manual shutdown sequence.

- The ON light of the MASTER SW pb-sw goes off.
- After a running period of 15 s (for No Break Power Transfer), the APU shuts down and the AVAIL light goes off,
- If the APU BLEED was selected, the APU performs a cooling period of 85 s at 82 % speed,
- At N 7 % the air-inlet flap closes.

Note: Switching the MASTER SW off then on, resets the ECB.

Ident.: DSC-49-20-A-00017862.0001001 / 21 MAR 16

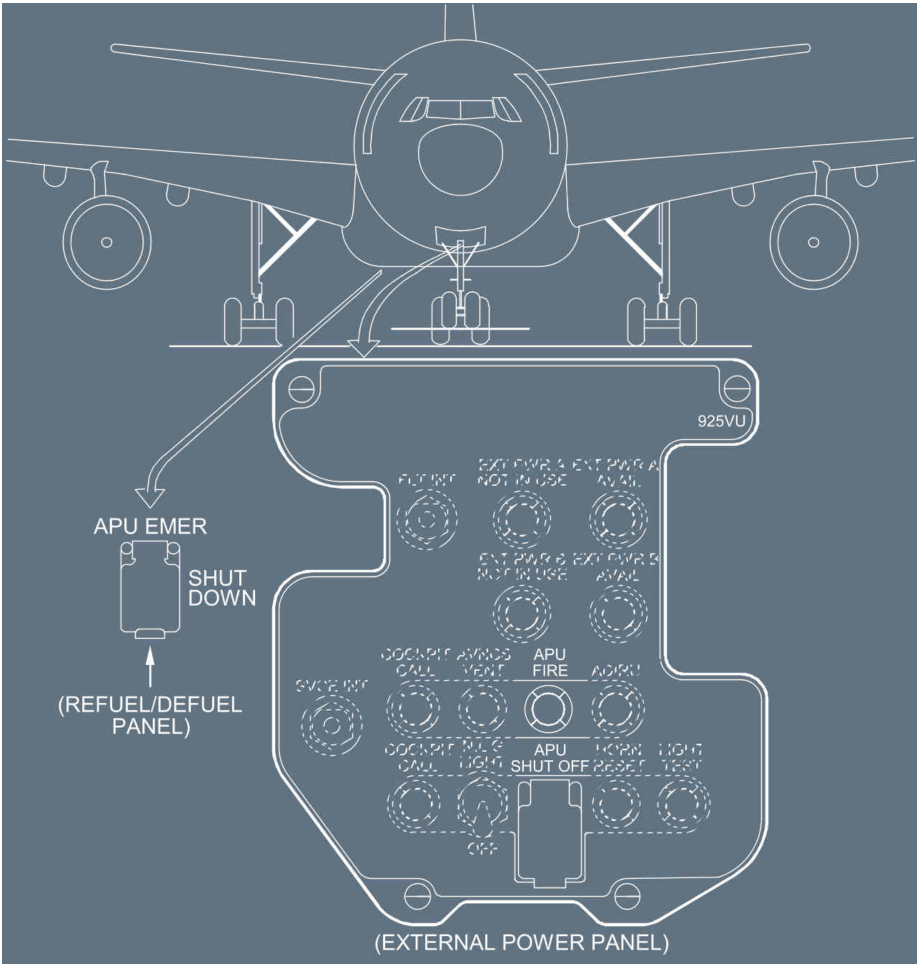
(2) APU START pb-sw

ON : The blue light comes on.
When the flap is completely open, the APU starter is energized.
When N = 7 %, ignition is turned on.
When N = 50 %, the APU starter is de-energized, and ignition is turned off.
When N = 95 %, the ON light on the START pushbutton goes off and AVAIL comes on in green.
The APU may now supply bleed air and electrical power to the aircraft systems.
10 s later, the APU page disappears from the ECAM display.

AVAIL lt : This light comes on green, when N reaches 95 %.

EXTERNAL CONTROLS

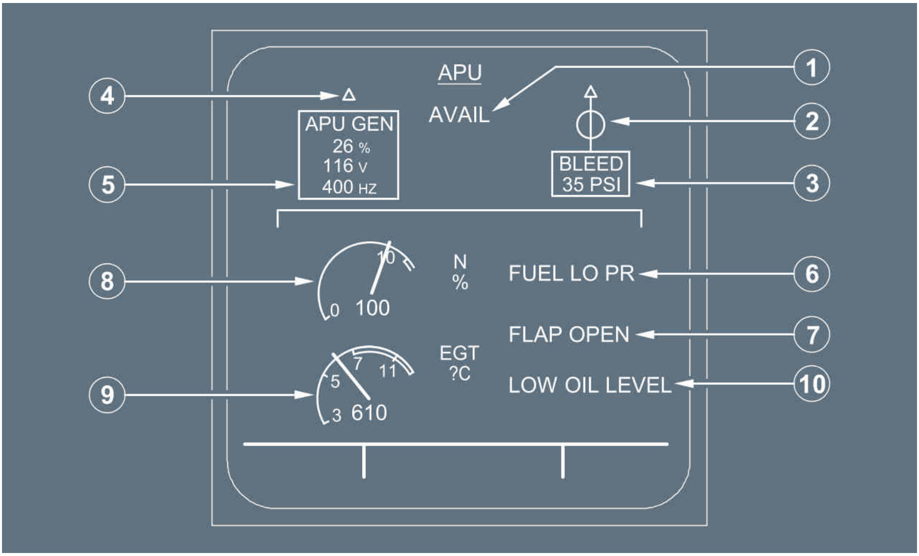
Ident.: DSC-49-20-00017865.0001001 / 21 MAR 16
Applicable to: ALL


APU EMER
SHUT DOWN
(REFUEL/DEFUEL PANEL)
925VU
FLT INT
EXT PWR A NOT IN USE
EXT PWR A AVAIL
EXT PWR B NOT IN USE
EXT PWR B AVAIL
COCKPIT CALL
AVNCS VENT
APU FIRE
ADIRU
SVCE INT
COCKPIT CALL
NLG LIGHT
OFF
APU SHUT OFF
HORN RESET
LIGHT TEST
(EXTERNAL POWER PANEL)

ECAM - APU SD PAGE

Applicable to: ALL

Ident.: DSC-49-20-B-00017866.0001001 / 21 MAR 16


APU
AVAIL
APU GEN
26 %
116 V
400 HZ
BLEED
35 PSI
N
%
0
10
100
EGT
?C
3
5
7
11
610
FUEL LO PR
FLAP OPEN
LOW OIL LEVEL
1
2
3
4
5
6
7
8
9
10

Ident.: DSC-49-20-B-00017867.0001001 / 21 MAR 16

(1) AVAIL Indication

It is in green, when APU N is above 95 %.

Ident.: DSC-49-20-B-00017869.0001001 / 21 MAR 16

(2) APU Bleed Valve Position

It is only displayed, if the APU MASTER sw is ON/R.

In line – Green	:	The APU valve is fully open.
Crossline – Green	:	The APU valve is not fully open, and APU BLEED pb is OFF.
Crossline – Amber	:	The APU valve is not fully open, if APU BLEED pb is ON.

Ident.: DSC-49-20-B-00017870.0001001 / 21 MAR 16

(3) APU Bleed Air Pressure

This box displays the relative bleed air pressure in green.

It shows an amber XX, when ADIRS 1 is not available or selected OFF.

Ident.: DSC-49-20-B-00017871.0001001 / 21 MAR 16

(4) APU GEN Line ContactorIndication

It is in green, when the APU GEN line contactor is closed.
It is in white, if the line contactor is open.

Ident.: DSC-49-20-B-00017872.0001001 / 21 MAR 16

(5) APU GEN

It is identical to the APU GEN parameters on the ELEC page.

Ident.: DSC-49-20-B-00017873.0001001 / 21 MAR 16

(6) FUEL LO PR

It is in amber, if APU fuel low pressure is detected.

Ident.: DSC-49-20-B-00017874.0001001 / 21 MAR 16

(7) FLAP OPEN

Displayed in green, when the APU air intake flap is fully open (MASTER SW pb-sw is ON).

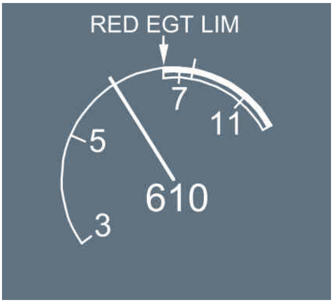
Ident.: DSC-49-20-B-00017875.0001001 / 21 MAR 16

(8) APU N

- Displays the APU speed in green
- It becomes red, when N ≥ 107 %.

Ident.: DSC-49-20-B-00017876.0001001 / 21 MAR 16

(9) APU EGT



- It displays the APU EGT (needle and digital indication) in green
- It pulses, when the ECB detects an advisory
- It becomes red, when EGT ≥ RED EGT LIM. In this case an automatic shutdown of the APU occurs.

  Note: *ECB calculates the RED EGT LIM and transmits it to the ECAM. It is equal to the lower border of the red sector. It is a function of N during start, and a function of ambient temperature and pressure when the APU is running.*
  Maximum EGT during start : 1 250 °C (corresponding to 0 % APU speed).
  Maximum EGT with APU running : 650 °C (Sea level, standard day).

Ident.: DSC-49-20-B-00017877.0001001 / 21 MAR 16

(10) LOW OIL LEVEL

This advisory is displayed, if the ECB detects a low APU oil level, when the aircraft is on ground and the APU is not running.

MEMO DISPLAY

Ident.: DSC-49-20-00017093.0001001 / 21 MAR 16
Applicable to: ALL

APU AVAIL : This memo appears in green when APU N is above 95%.

AIRCRAFT SYSTEMS

DOORS

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DSC-52-10 Description

DSC-52-10-10 General

General....A

DSC-52-10-20 Passengers Doors

General....A
Outside....B
Inside....C

DSC-52-10-30 Emergency Exits

Cockpit....A
Cabin....B

DSC-52-10-40 Cargo Doors

General....A
FWD and AFT Cargo Doors....B
Bulk Cargo Door....C
Cargo Doors....D

DSC-52-10-42 Lower Deck Cargo Doors

Location of the Service Panels....A

DSC-52-10-50 Avionics Compartment Access Door

Avionics Compartment Access Door....A

DSC-52-10-70 Escape Slides/Rafts

Cabin Door Slides/Rafts....A
Emergency Exit Slides....B
Escape Slide Arrangement....C

DSC-52-10-80 Doors and Slides Control System

General....A
Architecture....B
Overhead Maintenance Panel ◁ C

DSC-52-20 Controls and Indicators

ECAM DOOR/OXY Page....A

DSC-52-30 Cockpit Door Security System

DSC-52-30-10 Description

Cockpit Door Description....A
Cockpit Door Damper....B

Continued on the following page

Continued from the previous page

DSC-52-30-20 Cockpit Door Locking System (CDLS)

Description....A
Controls....B

DSC-52-30-30 Cockpit Door Surveillance System (CDSS)

Description....A
Controls....B

DSC-52-40 How to

How to Operate the Cockpit Door....A
How to Operate the Fwd and Aft Cargo Door....B
How to Operate the Fwd and Aft Cargo Doors (Auxiliary Operation)....C
How to Operate the Bi-Folding Lavatory Door in Emergency Operation....D
How to Leave the Aircraft via the Access Door in the Avionics Bay....E

DSC-52-100 Temporary Abnormal Behavior

Erroneous Activation of the Cabin Pressure Warning Lights without Residual differential Pressure....A

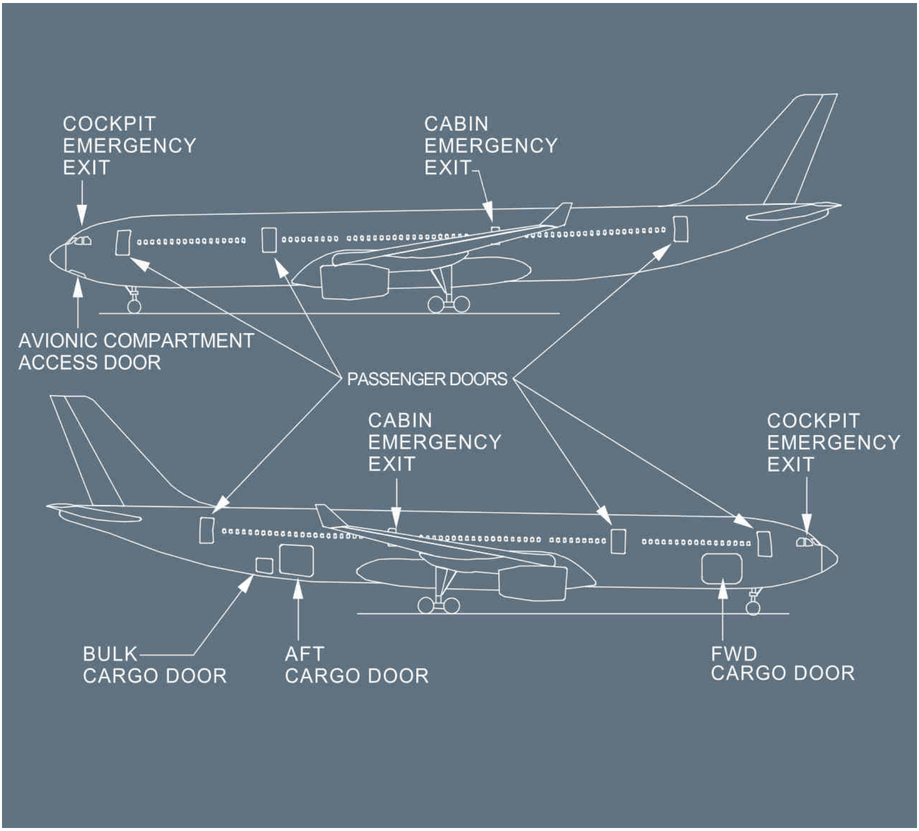
GENERAL

Ident.: DSC-52-10-10-00017252.0001001 / 21 MAR 16
Applicable to: ALL

The A330 fuselage has :

- Six passenger doors
- Two emergency exits in the cabin
- Two cockpit emergency exits (sliding windows)
- Three cargo compartment doors
- One avionic compartment access door.

All doors are monitored by the Doors and Slides Control System (DSCS). The DSCS generates indications and warnings on the doors and on the ECAM.


COCKPIT EMERGENCY EXIT
CABIN EMERGENCY EXIT
AVIONIC COMPARTMENT ACCESS DOOR
PASSENGER DOORS
CABIN EMERGENCY EXIT
COCKPIT EMERGENCY EXIT
BULK CARGO DOOR
AFT CARGO DOOR
FWD CARGO DOOR

GENERAL

Ident.: DSC-52-10-20-00017380.0001001 / 12 MAY 22
Applicable to: ALL

The aircraft has six plug-type doors that open outward and forward. There are three doors on each side of the fuselage (one door in FWD, MID and AFT sections).
The doors are operated from inside or outside. Normal operation is manual with hydraulic damping and a gust lock mechanism.
Each door has emergency features:

- A slide stowed in a container, attached to the inboard lower side of the door
- A damper actuator. In normal mode, the damper actuator limits the door travel. In emergency mode, the damper actuator drives the automatic door opening
- A slide arming lever.

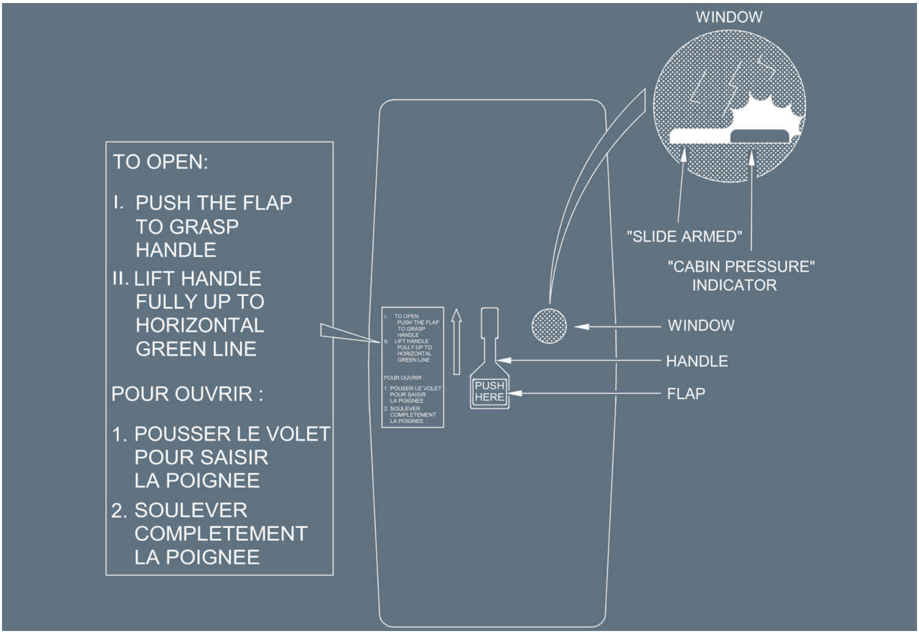
Note: *The aircraft can be equipped with either escape slide or slide raft.*

When the slide arming lever is in the ARMED position, the slide is connected to the floor brackets on both sides of the door. When the door is open from inside, the slide automatically inflates and deploys. If the inflation bottle fails to automatically discharge, a crew member can open its valve to make it discharge. Opening the door from outside disarms the door and the slide.
Each passenger door has:

- Two mechanical locking indicators that confirm the locked or unlocked position of the door
- One warning light to show the ARMED or DISARMED indication of the slides
- One CABIN PRESSURE warning light that illuminates in the case of a residual pressure in the cabin.

OUTSIDE

Ident.: DSC-52-10-20-00001069.0001001 / 21 MAR 16
Applicable to: ALL

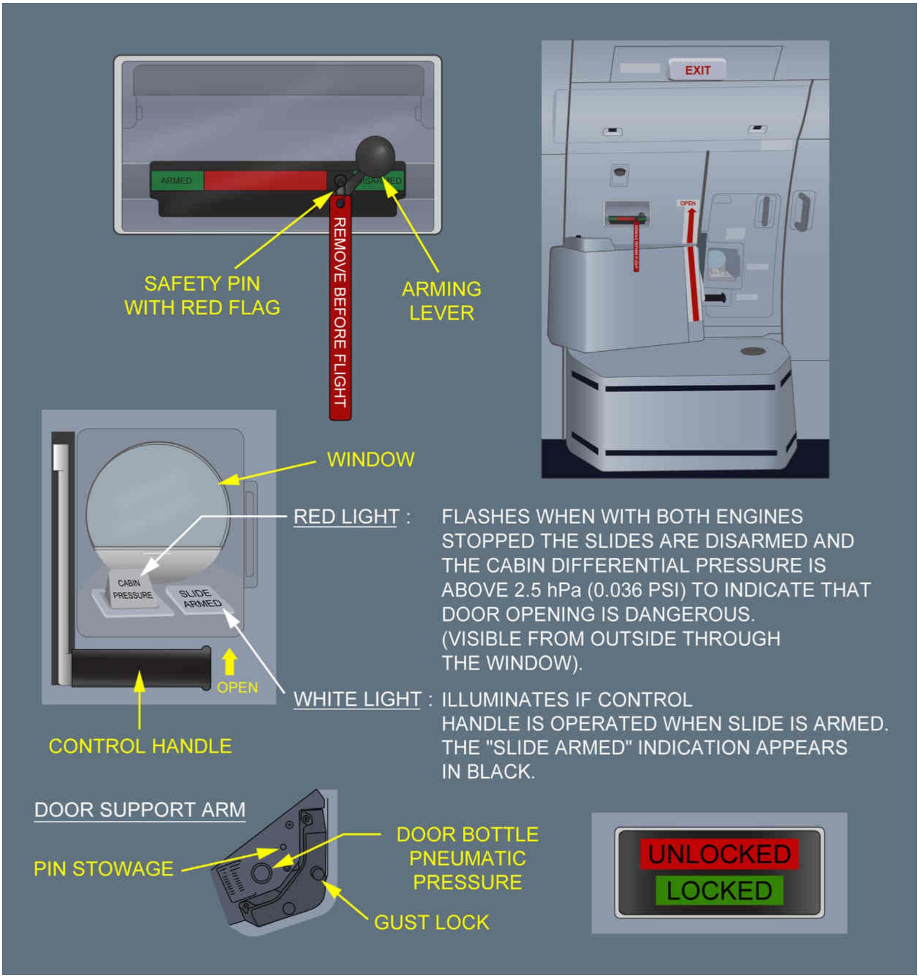

WINDOW
"SLIDE ARMED"
"CABIN PRESSURE" INDICATOR
TO OPEN:
I. PUSH THE FLAP TO GRASP HANDLE
II. LIFT HANDLE FULLY UP TO HORIZONTAL GREEN LINE
POUR OUVRIR :
1. POUSSER LE VOLET POUR SAISIR LA POIGNEE
2. SOULEVER COMPLETEMENT LA POIGNEE
PUSH HERE
WINDOW
HANDLE
FLAP

Each cabin door can be opened from the outside.
Opening instructions are posted next to the opening handle.

Note: *Opening a cabin door from the outside disarms the automatic opening system.*

INSIDE

Ident.: DSC-52-10-20-00001071.0003001 / 03 NOV 23
Applicable to: ALL


ARMED
DISARMED
REMOVE BEFORE FLIGHT
SAFETY PIN WITH RED FLAG
ARMING LEVER
EXIT
OPEN
WINDOW
CABIN PRESSURE
SLIDE ARMED
OPEN
CONTROL HANDLE
DOOR SUPPORT ARM
PIN STOWAGE
DOOR BOTTLE PNEUMATIC PRESSURE
GUST LOCK
UNLOCKED
LOCKED

RED LIGHT : FLASHES WHEN WITH BOTH ENGINES STOPPED THE SLIDES ARE DISARMED AND THE CABIN DIFFERENTIAL PRESSURE IS ABOVE 2.5 hPa (0.036 PSI) TO INDICATE THAT DOOR OPENING IS DANGEROUS. (VISIBLE FROM OUTSIDE THROUGH THE WINDOW).

WHITE LIGHT : ILLUMINATES IF CONTROL HANDLE IS OPERATED WHEN SLIDE IS ARMED. THE "SLIDE ARMED" INDICATION APPEARS IN BLACK.

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COCKPIT

Ident.: DSC-52-10-30-00017382.0002001 / 21 MAR 16
Applicable to: ALL

The two sliding windows in the cockpit are flight crew emergency exits.
A small compartment, located above each window, contains an escape rope that reaches the ground, when lowered through the cockpit window.
The cockpit windows can only be opened from inside.
Emergency cockpit evacuation is also possible through the cockpit door escape panel.

CABIN

Ident.: DSC-52-10-30-00017381.0001001 / 21 MAR 16
Applicable to: ALL

One plug-type emergency exit door is located on each side of the cabin.
They open outward and forward, and are each equipped with an escape slide. The escape slide is stowed in a container which is attached to the lower part of the emergency exit door.

Intentionally left blank

GENERAL

Ident.: DSC-52-10-40-00017386.0001001 / 21 MAR 16
Applicable to: ALL

The aircraft has two cargo compartment doors and a bulk cargo compartment door ⊲✳ on the right side of the fuselage, below the cabin floor.

FWD AND AFT CARGO DOORS

Ident.: DSC-52-10-40-00017385.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

The FWD and AFT cargo doors open outward and upward. The doors are hydraulically operated by the yellow hydraulic system. The door locking system is mechanical. When a door is open, the door actuator is mechanically locked in its extended position.
If the electric pump of the yellow hydraulic system fails, the system can be powered by using a hand pump, located on the hydraulic maintenance panel.
The FWD and AFT cargo doors open only from the outside.
A red light fitted in the compartment of the locking handle indicates a residual cabin pressure.
The door open indicator light confirms that the door is locked in the open position for a safe cargo loading operation.
Ten flag indicators inform the operator that the door is fully locked. A pop-up flag indicator warns of an open loop (the door is not fully locked).

Note: *When the electric pump operates the FWD or AFT cargo door, the remaining yellow system device that operates is the engine 2 thrust reverser. The leak measurement valves of yellow system close, and an SFCC inhibition prevents any flap movement.*

FWD AND AFT CARGO DOORS

Ident.: DSC-52-10-40-00017385.0003001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The FWD and AFT cargo doors open outward and upward. The doors are hydraulically operated by the yellow hydraulic system. The door locking system is mechanical. When a door is open, the door actuator is mechanically locked in its extended position.
If the electric pump of the yellow hydraulic system fails, the system can be powered by using a hand pump, located on the hydraulic maintenance panel.
The FWD and AFT cargo doors open only from the outside.
A red light fitted in the locking handle’s compartment indicates a residual cabin pressure.
The door open indicates light confirms that the door is locked in the open position for a safe cargo loading operation.
Ten flag indicators inform the operator that the door is fully locked. A pop-up flag indicator warns of an open loop (the door is not fully locked).

Note: *When the electric pump operates the FWD or AFT cargo door, no other yellow system device remains operative. The leak measurement valves of yellow system close, and an SFCC inhibition prevents any flap movement.*

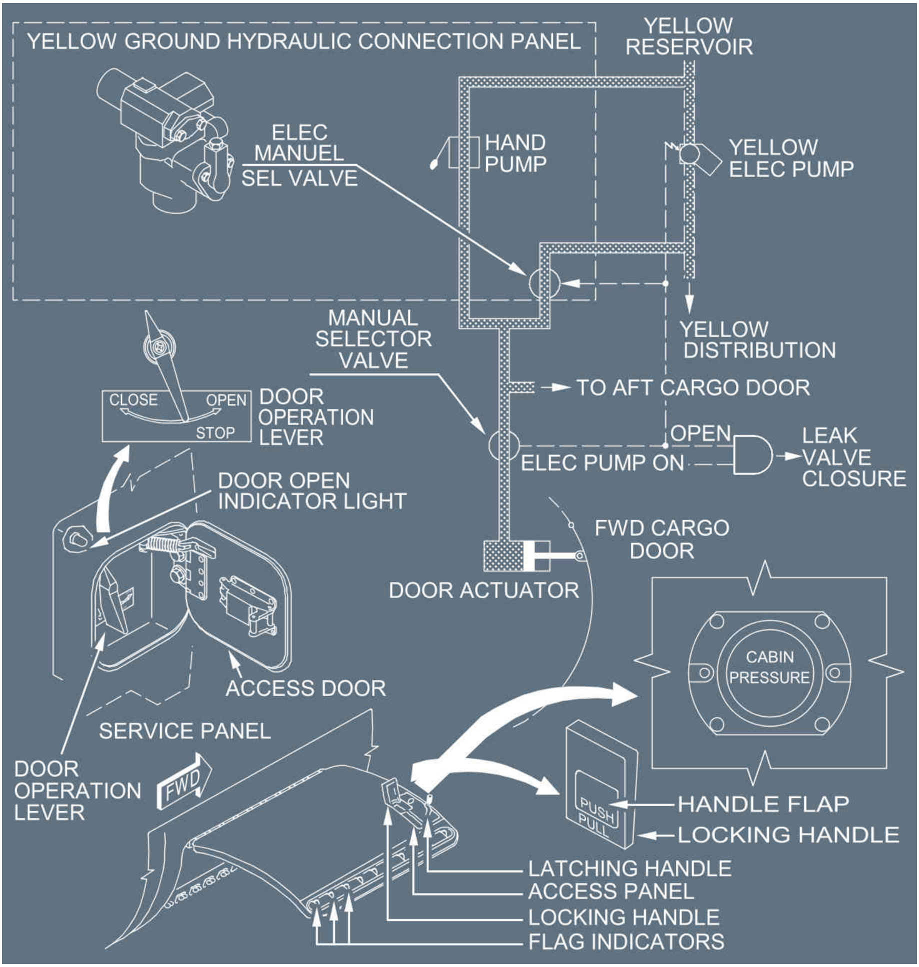
BULK CARGO DOOR

Ident.: DSC-52-10-40-00017384.0001001 / 21 MAR 16
Applicable to: ALL

The bulk cargo door is a plug-type door that is mechanically locked and manually operated. The bulk cargo door opens inward and upward.
The bulk cargo door can be opened either from inside or from the outside.

CARGO DOORS

Ident.: DSC-52-10-40-00017383.0002001 / 21 MAR 16
Applicable to: ALL


YELLOW GROUND HYDRAULIC CONNECTION PANEL
YELLOW RESERVOIR
ELEC MANUEL SEL VALVE
HAND PUMP
YELLOW ELEC PUMP
MANUAL SELECTOR VALVE
YELLOW DISTRIBUTION
CLOSE
OPEN
STOP
DOOR OPERATION LEVER
TO AFT CARGO DOOR
OPEN
ELEC PUMP ON
LEAK VALVE CLOSURE
DOOR OPEN INDICATOR LIGHT
FWD CARGO DOOR
DOOR ACTUATOR
CABIN PRESSURE
ACCESS DOOR
SERVICE PANEL
DOOR OPERATION LEVER
FWD
PUSH
PULL
HANDLE FLAP
LOCKING HANDLE
LATCHING HANDLE
ACCESS PANEL
LOCKING HANDLE
FLAG INDICATORS

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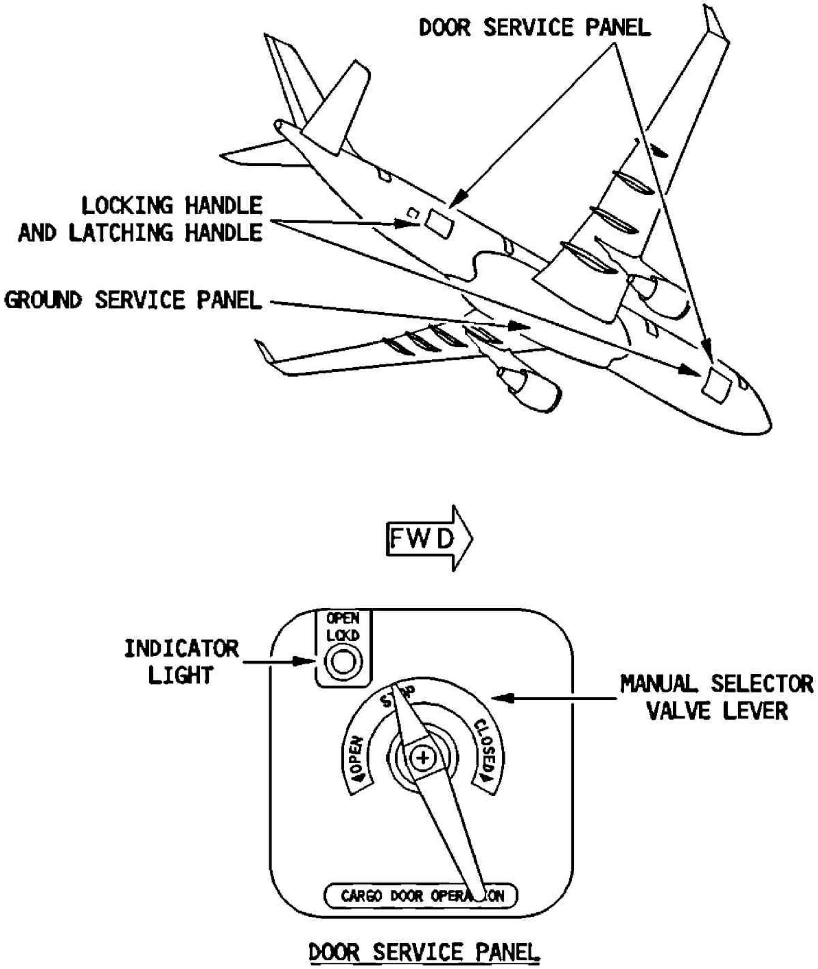
LOCATION OF THE SERVICE PANELS

Ident.: DSC-52-10-42-00020504.0001001 / 17 MAR 17
Applicable to: ALL


DOOR SERVICE PANEL
LOCKING HANDLE
AND LATCHING HANDLE
GROUND SERVICE PANEL
FWD
INDICATOR
LIGHT
OPEN
LCKD
MANUAL SELECTOR
VALVE LEVER
STOP
OPEN
CLOSED
CARGO DOOR OPERATION
DOOR SERVICE PANEL

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AVIONICS COMPARTMENT ACCESS DOOR

Ident.: DSC-52-10-50-00018091.0001001 / 21 MAR 16
Applicable to: ALL

The avionics compartment access door enables an external access to the avionics compartment.
The door is a manually operated hinged door and opens inwards. This door is located on the lower fuselage, forward of the nose landing gear bay. An avionics compartment access ladder ◁* is stowed inside the compartment, adjacent to this door which may either be operated from the interior or exterior.
The avionics compartment is also accessible from the cockpit, via a hatch in the floor behind the captain’s seat. A ladder is fixed in the avionics compartment for access from the cockpit.

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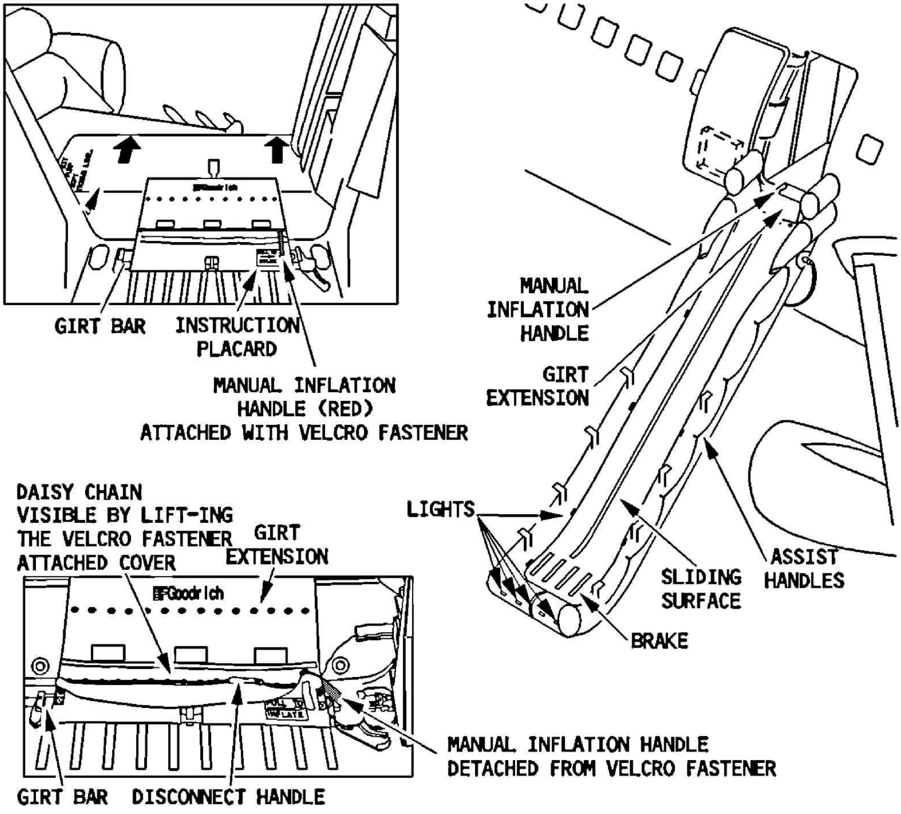
CABIN DOOR SLIDES/RAFTS

Ident.: DSC-52-10-70-00001096.0001001 / 14 FEB 11
Applicable to: ALL


GIRT BAR
INSTRUCTION PLACARD
MANUAL INFLATION HANDLE (RED) ATTACHED WITH VELCRO FASTENER
BFGoodrich
MANUAL INFLATION HANDLE
GIRT EXTENSION
LIGHTS
SLIDING SURFACE
ASSIST HANDLES
BRAKE
DAISY CHAIN VISIBLE BY LIFT-ING THE VELCRO FASTENER ATTACHED COVER
GIRT EXTENSION
BFGoodrich
PULL TO INFLATE
MANUAL INFLATION HANDLE DETACHED FROM VELCRO FASTENER
GIRT BAR
DISCONNECT HANDLE

SLIDE MODE

Automatic operation : Normally automatic inflation when slide is armed and door opens

Manual operation : If the slide falls down from the door but does not inflate, inflation can be started manually by pulling the handle which is attached at the girt extension of the slide/raft.

RAFT MODE

To disconnect the slide from the aircraft, pull the disconnect handle. The slide raft is moored to the aircraft by means of the ditching line which has to be cut to completly free the slide/raft from the aircraft.

EMERGENCY EXIT SLIDES

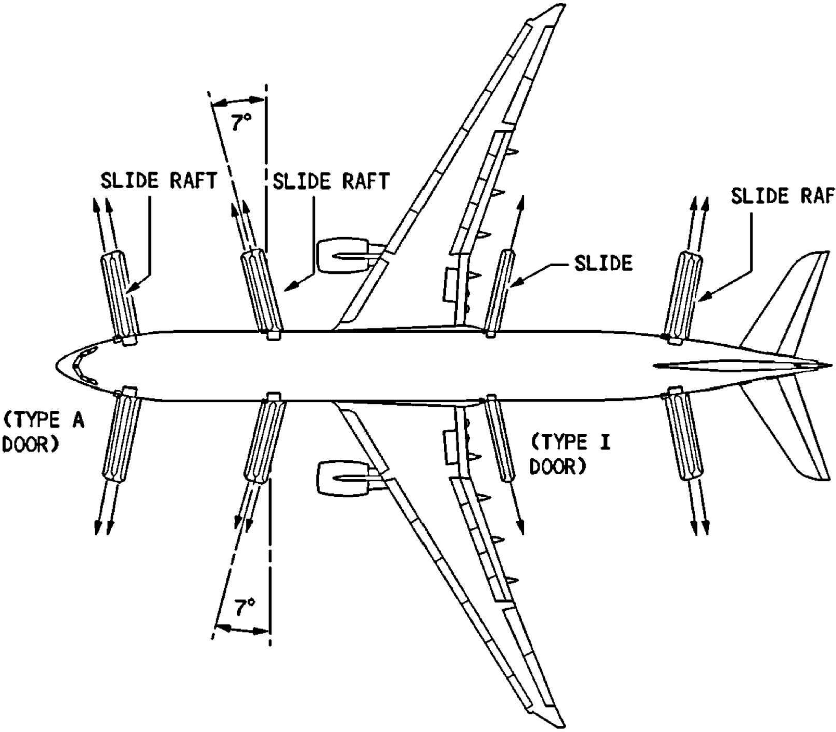
Ident.: DSC-52-10-70-00001104.0001001 / 21 MAR 16
Applicable to: ALL

Operation is identical to passenger door slides/rafts operation. Only the slide mode is available.

ESCAPE SLIDE ARRANGEMENT

Ident.: DSC-52-10-70-00018095.0001001 / 21 MAR 16
Applicable to: ALL

Each passenger door has a dual lane escape slide raft, and each emergency exit has a single lane escape slide.


7°
SLIDE RAFT
SLIDE RAFT
SLIDE RAFT
SLIDE
(TYPE A DOOR)
(TYPE I DOOR)
7°

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GENERAL

Ident.: DSC-52-10-80-00018096.0001001 / 21 MAR 16
Applicable to: ALL

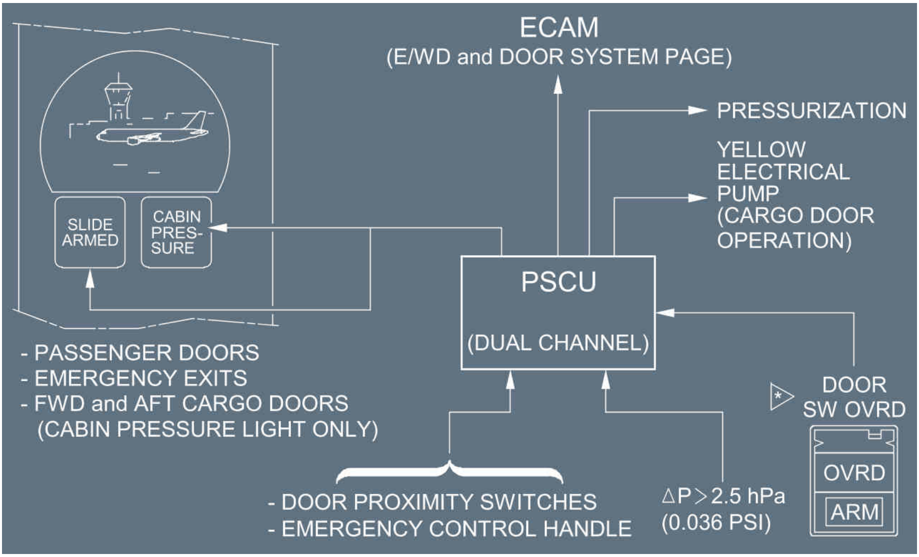
The Doors and Slides Control System (DSCS) consists of:
- Proximity switches, installed on each door
- The Proximity Switch Control Unit (PSCU)
- A pressure switch (ΔP of the cabin)
- An autonomous standby power supply.

The Doors and Slide Control system performs the following functions:
- Door warning system: Indicates the state (LOCKED/UNLOCKED) of each door on the ECAM
- Escape slide warning system: Indicates the state (ARMED/DISARMED) of the slide, on the ECAM and on the slide warning light. In addition to the white light, a warning horn ◁✳ sounds to avoid an inadvertent escape slide extension, during normal door opening
- Overpressure warning system: Indicates an excessive residual differential cabin pressure to the passenger doors, the emergency exits, and the FWD and AFT cargo doors
- Electrical control of the FWD and AFT cargo doors.

When a door (CAB, CARGO, BULK) is not fully closed and locked, or a sensor is faulty, the DSCS prevents aircraft pressurization with one engine running. In such a case, the DSCS signals the cabin pressure system to keep the outflow valves open, and signals the zone controller to close the pack flow control valves.
If one proximity switch fails, the faulty switch can be overridden by using the DOOR SW OVRD pb ◁✳ , as per the MMEL procedure.

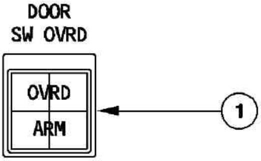
ARCHITECTURE

Ident.: DSC-52-10-80-00018097.0001001 / 21 MAR 16
Applicable to: ALL


ECAM
(E/WD and DOOR SYSTEM PAGE)
PRESSURIZATION
YELLOW ELECTRICAL PUMP (CARGO DOOR OPERATION)
SLIDE ARMED
CABIN PRES-SURE
PSCU
(DUAL CHANNEL)
- PASSENGER DOORS
- EMERGENCY EXITS
- FWD and AFT CARGO DOORS
(CABIN PRESSURE LIGHT ONLY)
DOOR SW OVRD
OVRD
ARM
- DOOR PROXIMITY SWITCHES
- EMERGENCY CONTROL HANDLE
ΔP>2.5 hPa
(0.036 PSI)

OVERHEAD MAINTENANCE PANEL ⊲

Ident.: DSC-52-10-80-00018098.0001001 / 21 MAR 16
Applicable to: ALL


DOOR
SW OVRD
OVRD
ARM
1

(1) DOOR SW OVRD (guarded) switch :

ARM light : Comes on in white, when the pushbutton is pressed once. Initiates the override procedure.

OVRD light :	Comes on in blue, when the pushbutton is pressed once again, after the affected door has been locked and checked locked. The override procedure is successful.

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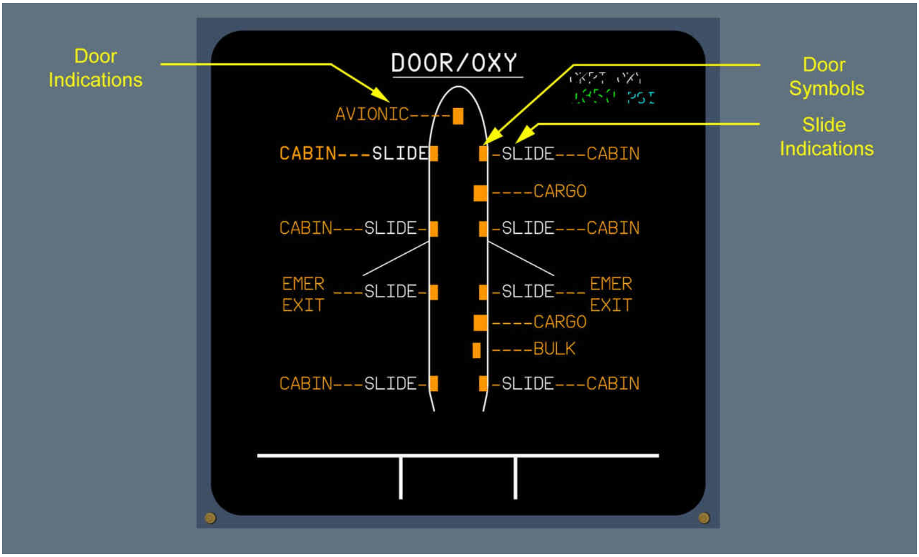
ECAM DOOR/OXY PAGE

Ident.: DSC-52-20-00018099.0001001 / 28 MAY 20
Applicable to: ALL


Door Indications
DOOR/OXY
CKPT OXY
1850 PSI
Door Symbols
Slide Indications
AVIONIC-----
CABIN---SLIDE
-SLIDE---CABIN
----CARGO
CABIN---SLIDE-
-SLIDE---CABIN
EMER EXIT ---SLIDE-
-SLIDE--- EMER EXIT
----CARGO
----BULK
CABIN---SLIDE-
-SLIDE---CABIN

DOOR SYMBOLS

☐	The door is closed and locked.
■	The door is not locked.
X	The information is not valid.

DOOR INDICATIONS

AVIONIC-----	The door is not locked.
AVIONIC-----	The information is not valid.

SLIDE INDICATIONS

SLIDE	The slide is armed.

COCKPIT DOOR DESCRIPTION

Ident.: DSC-52-30-10-00017227.0009001 / 20 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

A forward-opening hinge door separates the cockpit from the passenger compartment. It has an electric-locking latch, controlled by the flight crew. In normal conditions, when the door is closed, it remains locked. When there is a request to enter the cockpit, the flight crew can authorize entry by unlocking the door, that remains closed until it is pushed open.

When the flight crew does not respond to requests for entry, the door can also be unlocked by the cabin crew, by entering a two to seven-digit code (programmed by the airline) on the keypad, installed on the door post. The door is bulletproof and fully compliant with rapid decompression requirements.

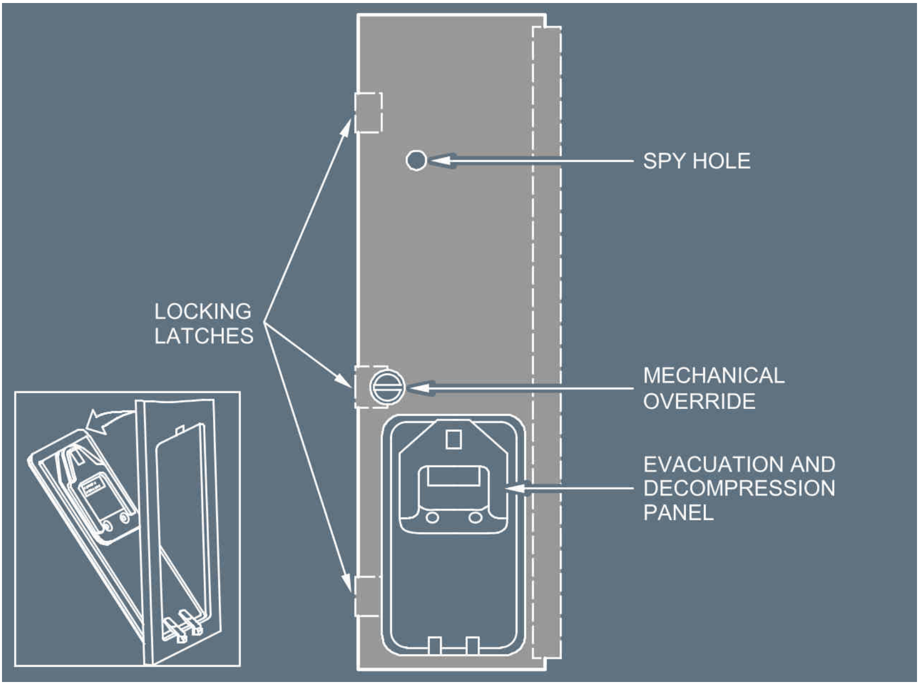
A mechanical override enables the flight crew to open the door from the cockpit side.

The evacuation and decompression panel enables the flight crew to evacuate the cockpit, in case of an emergency, when the door is jammed or stuck.

This panel can only be removed from the cockpit side by kicking it open.

The panel also automatically falls open, in case of rapid cabin decompression (in case of rapid decompression in the cockpit, the CDLS automatically unlocks the door).

In case of an electrical supply failure, the door is automatically unlocked, but remains closed.



A deadbolt ◁ located near the center latch area of the cockpit door, enables to bolt the door from the cockpit side, in the event that more than one locking latch strike fails, or in the case of a total CDLS failure.
A Circuit Breaker (C/B) box, is installed on the left-hand side of the door frame.
This C/B box has three C/Bs. Each C/B is connected to one cockpit door electrical latch.

COCKPIT DOOR DESCRIPTION

Ident.: DSC-52-30-10-00017227.0010001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

A forward-opening hinge door separates the cockpit from the passenger compartment. It has an electric-locking latch, controlled by the flight crew. In normal conditions, when the door is closed, it remains locked. When there is a request to enter the cockpit, the flight crew can authorize entry by unlocking the door, that remains closed until it is pushed open.
When the flight crew does not respond to requests for entry, the door can also be unlocked by the cabin crew, by entering a two to seven-digit code (programmed by the airline) on the keypad,

installed on the door post. The door is bulletproof and fully compliant with rapid decompression requirements.

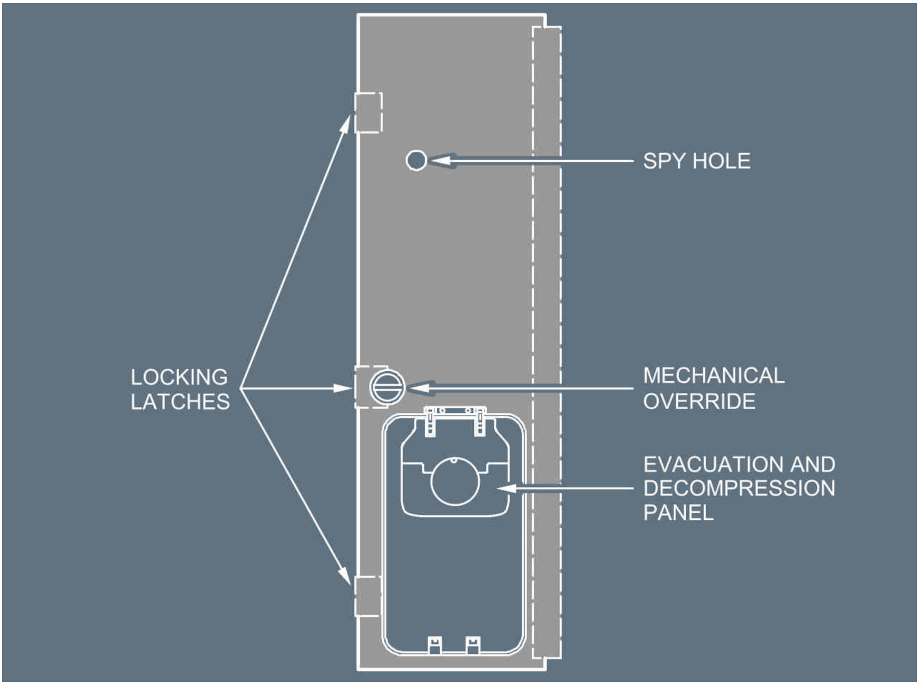
A mechanical override enables the flight crew to open the door from the cockpit side.

The evacuation and decompression panel enables the flight crew to evacuate the cockpit, in case of an emergency, when the door is jammed or stuck.

This panel can only be removed from the cockpit side by kicking it open.

The panel also automatically falls open, in case of rapid cabin decompression (in case of rapid decompression in the cockpit, the CDLS automatically unlocks the door).

In case of an electrical supply failure, the door is automatically unlocked, but remains closed.



A deadbolt ◁ located near the center latch, enables to bolt the door from the cockpit side, in the event that more than one locking latch strike fails, or in the case of a total CDLS failure.

A Circuit Breaker (C/B) box, is installed on the left-hand side of the door frame.

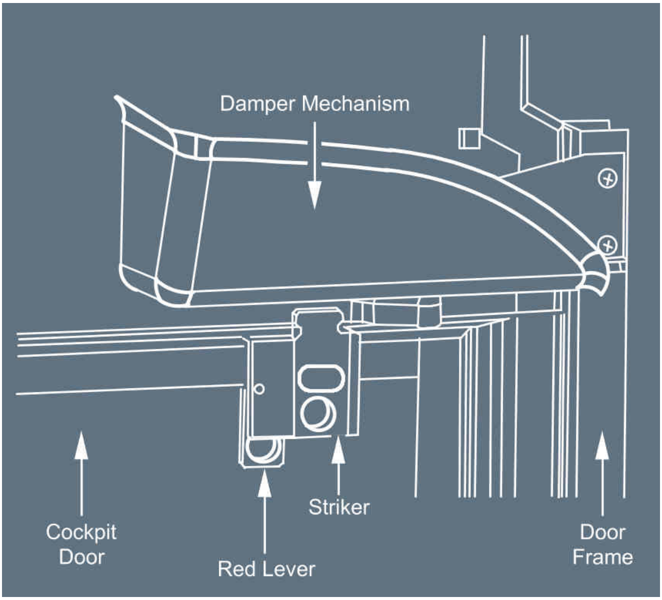
This C/B box has three C/Bs. Each C/B is connected to one cockpit door electrical latch.

COCKPIT DOOR DAMPER

Ident.: DSC-52-30-10-00014315.0001001 / 11 MAY 12
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

The cockpit door has a noise damper installed on its top right corner, on the cockpit side.
The damper slows down the door during closing.

In the case of a damper blockage, to disengage the damper, the flight crew has to:
- rotate the red lever up
- pull the striker down until it aligns with the door edge, and
- rotate the red lever back down to lock the striker in the down position.



DESCRIPTION

Ident.: DSC-52-30-20-00019042.0005001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The Cockpit Door Locking System (CDLS) provides a means of electrically locking and unlocking the cockpit door. This system is mainly composed of:

- A keypad, located in the forward cabin, near the cockpit door,
- A toggle switch, located on the center pedestal's Cockpit Door panel,
- A control unit and its CKPT DOOR CONT normal panel, located on the overhead panel,
- A backup control unit, identical to the first one, and its CKPT DOOR CONT backup panel, located on the overhead panel,
- An additional CKPT DOOR BKUP panel, which is composed of a LKG SYS switch and a OPEN/FAULT control pushbutton,
- A buzzer.

The keypad enables the cabin crew to request access to the cockpit. There are two different access request types: “Routine” and “Emergency” access request.
The toggle switch enables the flight crew to lock or unlock the cockpit door, following an access request, thereby allowing or denying entry into the cockpit.

The cockpit door control unit is the system controller, in charge of:

- Locking or unlocking the door latches, upon flight crew action.
- Unlocking the door, in case of cockpit decompression (the door then opens towards the cockpit under differential pressure).
- Indicating system failures of electrical latches and pressure sensors.
- Activating the access request buzzer and turning on the keypad LEDs.

The CDLS backup control unit is a backup for locking/unlocking the door by flight crew action, and for unlocking the door in case of decompression. The backup control has to be used only when the normal control unit has failed, or when the two pressure sensors have failed.

When operating the CDLS with the backup control unit, both the toggle switch and the keypad are inoperative. In this condition:

- The cabin crew has to use the interphone to perform any cockpit access request, and
- The flight crew has to use the OPEN/FAULT CTL P/B located on the CKPT DOOR BKUP overhead panel, to unlock the door when access to the cockpit is authorized.
- No emergency access from the cabin to the cockpit is available.

By using the CKPT DOOR BKUP LKG SYS selector, it is possible to operate the CDLS in normal condition, in backup condition, or to deactivate the system to facilitate maintenance tasks and ground operations.

The buzzer sounds in the cockpit for 1 to 9 s to indicate that a routine access request has been made, or sounds continuously if an emergency access procedure has been initiated.

DESCRIPTION

Ident.: DSC-52-30-20-00019042.0001001 / 20 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

The Cockpit Door Locking System (CDLS) provides a means of electrically locking and unlocking the cockpit door. This system is mainly composed of :
- A keypad, located in the forward cabin, near the cockpit door,
- A toggle switch, located on the center pedestal's Cockpit Door panel,
- A control unit and its CKPT DOOR CONT normal panel, located on the overhead panel,
- A buzzer.
- A CKPT DOOR LKG SYS sw ◁✱ located on the overhead panel.

The keypad enables the cabin crew to request access to the cockpit. There are two different access request types : “Routine” and “Emergency” access request.
The toggle switch enables the flight crew to lock or unlock the cockpit door, following an access request, thereby allowing or denying entry into the cockpit.

The cockpit door control unit is the system controller, in charge of :
- Locking or unlocking the door latches, upon flight crew action.
- Unlocking the door, in case of cockpit decompression (the door then opens towards the cockpit under differential pressure).
- Indicating system failures of electrical latches and pressure sensors.
- Activating the access request buzzer and turning on the keypad LEDs.

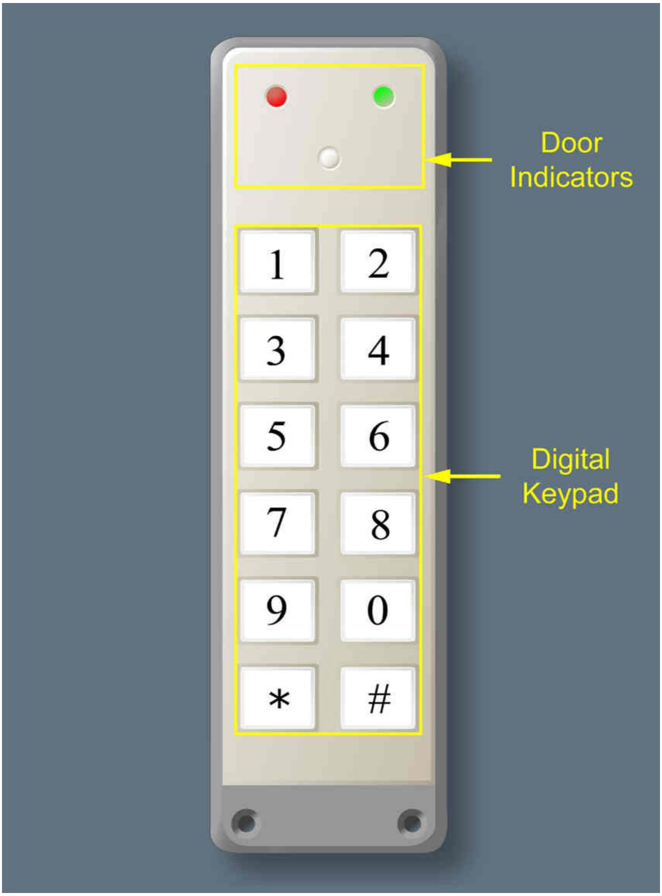
The buzzer sounds in the cockpit for 1 to 9 s to indicate that a routine access request has been made, or sounds continuously if an emergency access procedure has been initiated.
The CKPT DOOR LKG SYS sw enables the CDLS to be switched off, to facilitate maintenance tasks and ground operations.

CONTROLS

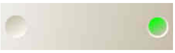
Ident.: DSC-52-30-20-10-00000145.0002001 / 03 MAY 23
Applicable to: ALL

KEYPAD

The keypad is used by the cabin crew to request flight crew to open the door.



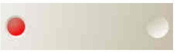
DOOR INDICATORS



Green LED Steady: The door unlocks after 2 s, and can be opened.

Note: *The flight crew sets the CKPT DOOR sw to UNLOCK, or the cockpit door unlocks automatically for 5 s after an emergency access request.*

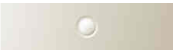
Green LED Flashing: A crewmember entered the emergency access code on the keypad.



Red LED Steady: The door is locked, and cannot be opened. The keypad is inhibited for a predefined period of time.

Note: *The flight crew sets the CKPT DOOR sw to LOCK.*

The Operator defines the inhibition time (between 5 min and 20 min).



White LED ⊲✱ On: When any key is pressed.

DIGITAL KEYPAD

The keypad is used to sound the buzzer in the cockpit for one to nine seconds (3 s by default), by entering a zero to seven-digit code, as programmed by the airline, followed by the '#' key.
It is also used to enter the two to seven-digit emergency code, followed by the '#' key, when the flight crew does not respond.

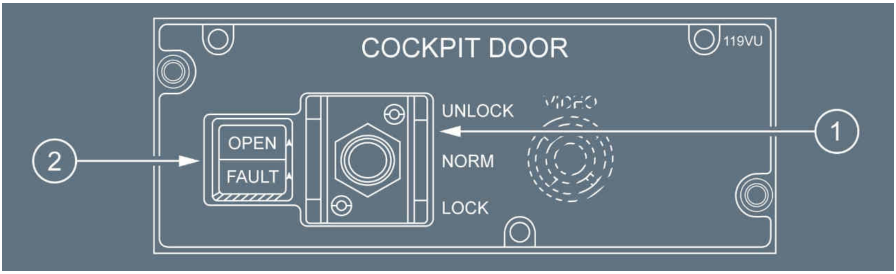
Note: *During the test performed by the cockpit door control unit, the CDLS keypad remains operational, and the CDLS operates as follows:*

The control unit will store access codes that are entered, and the LOCKED/UNLOCKED DOOR INDICATOR (RED/GREEN LEDs) of the keypad will remain on, as long as the test is running:
- *If the correct access code is entered on the keypad, the buzzer will not sound, until the test is completed*
- *If the emergency access code is entered, the door will unlock. The cockpit buzzer and the LOCKED/UNLOCKED DOOR INDICATOR will be inoperative.*

Ident.: DSC-52-30-20-10-00000150.0001001 / 20 MAR 17
Applicable to: ALL

CENTRAL PEDESTAL COCKPIT DOOR PANEL

The secured cockpit door opening is controlled by a toggle switch, located on the central pedestal.



(1) COCKPIT DOOR sw

UNLOCK position	:	This position is used to enable the cabin crewmember to open the door. The switch must be pulled and maintained in the unlock position until the door is pushed open.
NORM position	:	All latches are locked, and EMERGENCY access is possible for the cabin crew.
LOCK position	:	Once the switch has been moved to this position, the door is locked; emergency access, the buzzer, and the keypad are inhibited for a preselected time (5 to 20 min).

Note:
1. *If the LOCK position has not been used by the pilot, for at least 5 to 20 min, the cabin crew is able to request emergency access to open the cockpit door.*
2. *The UNLOCK position overrides and resets any previous selection.*
3. *In case of an electrical supply failure, the cockpit door is automatically unlocked, but remains closed.*

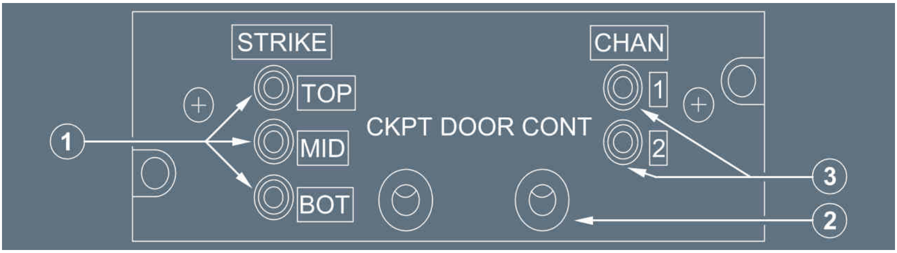
(2) COCKPIT DOOR Fault Open

OPEN light ON	:	The door is not closed.
OPEN light flashes	:	The cabin crew has started an emergency access procedure. If there is no reaction from the flight crew, the door will unlock at the end of the adjustable time delay (15 to 120 s).
FAULT	:	This light comes on when a system failure has been identified (Example: Latch, pressure sensors, control unit). The inoperative item can be identified by checking the strike and pressure sensor status lights on the CKPT DOOR CONT panel.

Ident.: DSC-52-30-20-10-00000155.0001001 / 09 OCT 12
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

OVERHEAD CONTROL PANEL

The cockpit door locking system's control panel is located on the overhead panel.



(1) Strikes' status lights

Off : The corresponding (upper, mid, or lower) locking latch is operative.

On : The corresponding (upper, mid, or lower) locking latch is faulty.

(2) Pressure sensor

Two redundant differential pressure sensors enable rapid pressure variation in the cockpit to be detected, in order to command simultaneous opening of all latches when a defined pressure drop is detected.

(3) Pressure sensor status lights

Off : The corresponding (1 or 2) pressure sensor is operative.

On : The corresponding (1 or 2) pressure sensor is faulty.

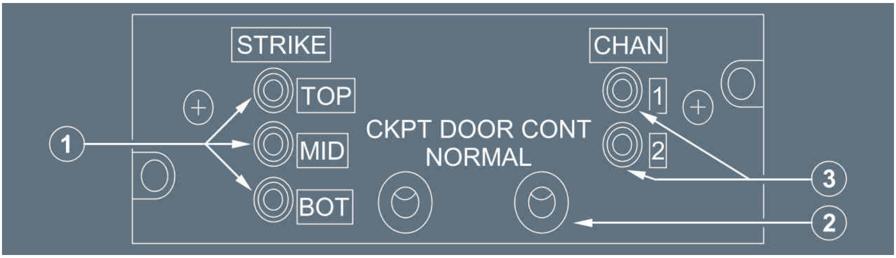
Note: These indicators enable the crew to identify the faulty item, when the Central Pedestal Fault indicator light is ON.

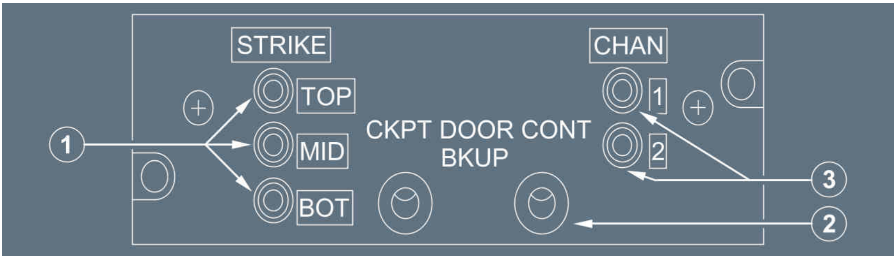
Ident.: DSC-52-30-20-10-00000155.0002001 / 09 OCT 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

OVERHEAD CONTROL PANEL

The CDLS consists of two separate but identical control units and, therefore, there are two CKPT DOOR CONT panels (normal and backup). The normal control panel is located on the overhead left-hand side, whereas the backup is located on the right-hand side.





(1) Strikes' status lights

Off : The corresponding (upper, mid, or lower) locking latch is operative.

On : The corresponding (upper, mid, or lower) locking latch is faulty.

(2) Pressure sensor

Two redundant differential pressure sensors enable rapid pressure variation in the cockpit to be detected, in order to command simultaneous opening of all latches when a defined pressure drop is detected.

(3) Pressure sensor status lights

Off : The corresponding (1 or 2) pressure sensor is operative.

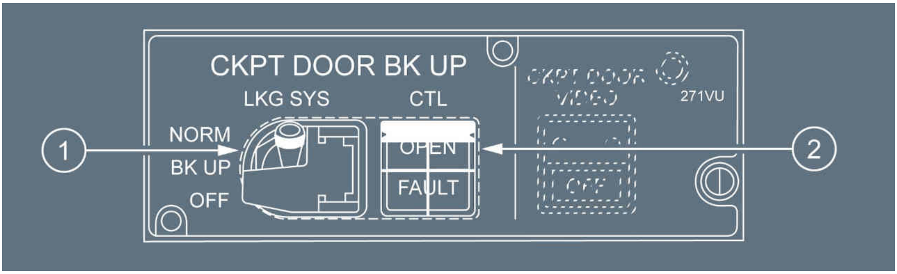
On : The corresponding (1 or 2) pressure sensor is faulty.

Note: *These indicators enable the crew to identify the faulty item, when the CDLS Fault indicator light is ON, (either for the normal or backup system).*

Ident.: DSC-52-30-20-10-00019214.0007001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

COCKPIT DOOR BACKUP

The Cockpit Door Backup control panel has a guarded, three-position switch, and a CTL pushbutton with a dual visual indicator.



(1) LKG SYS selector

NORM : The basic system has no failure; the normal control is operative.

BK UP : Normal control is deactivated, and Backup control is activated.

OFF : The Cockpit Door Locking System is deactivated. Both normal and backup controls are inoperative. Therefore, the door is unlocked. It can be pushed open from the cabin side.

(2) CTL guarded pushbutton, OPEN/FAULT indicator

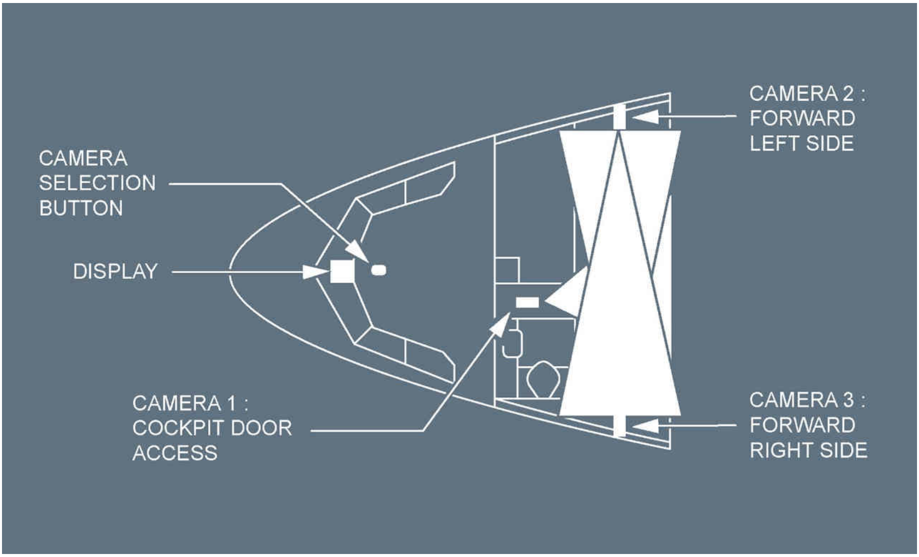
OPEN P/B	Pressing this pushbutton unlocks the door. Keep the pushbutton pressed, until the door is pushed open.
OPEN light ON	The door is not closed.
FAULT ON	This light comes on, when a backup system failure has been identified. The inoperative item can be identified by checking the strike and pressure sensor status lights on the CKPT DOOR CONT backup panel.

DESCRIPTION

Ident.: DSC-52-30-30-00019217.0002001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

The Cockpit Door Surveillance System (CDSS) consists of three video cameras. Video cameras enable the flight crew to identify persons prior to authorizing their entry into the cockpit. The lower ECAM display displays various camera views.

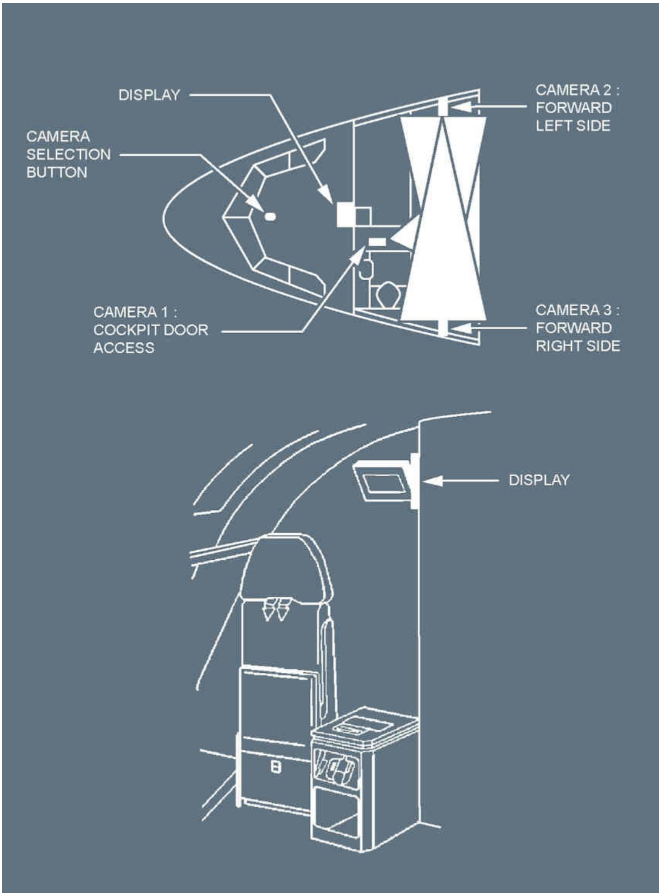
A control panel located on the central pedestal enables:
- Selection of CDSS display on the SD
- Change of different camera views.


CAMERA SELECTION BUTTON
DISPLAY
CAMERA 1 : COCKPIT DOOR ACCESS
CAMERA 2 : FORWARD LEFT SIDE
CAMERA 3 : FORWARD RIGHT SIDE

DESCRIPTION

Ident.: DSC-52-30-30-00019217.0001001 / 20 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

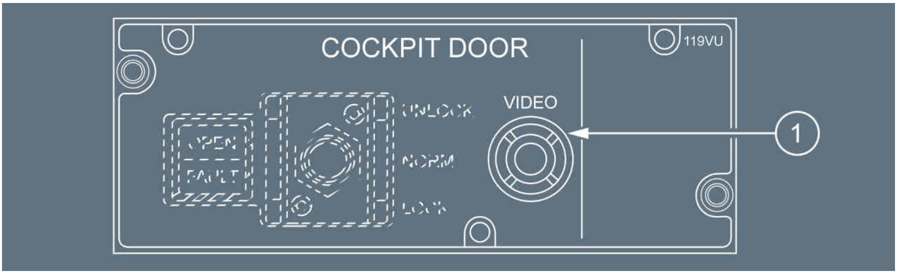
The Cockpit Door Surveillance System (CDSS) consists of three video cameras. Video cameras enable the flight crew to identify persons prior to authorizing their entry into the cockpit. A display (LCD), located in the rear part of the cockpit, displays the various camera views. The display has automatic brightness adjustment and is activated by the Cockpit Door Video pb.


DISPLAY
CAMERA SELECTION BUTTON
CAMERA 2 : FORWARD LEFT SIDE
CAMERA 1 : COCKPIT DOOR ACCESS
CAMERA 3 : FORWARD RIGHT SIDE
DISPLAY

CONTROLS

Ident.: DSC-52-30-30-10-00019218.0020001 / 20 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

CENTRAL PEDESTAL

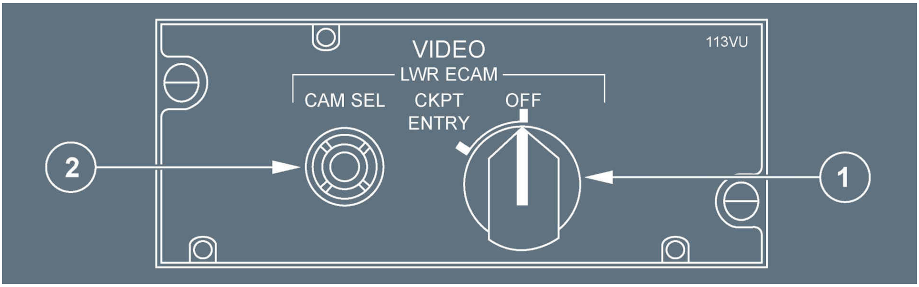


(1) Video pb
Selects the various camera image displays:

Camera 1 image	:	Displayed by pressing the pushbutton when the screen is on standby, or after Camera 2 and 3 images have been displayed. Automatically displayed, after an entry request is performed on the keypad.
Camera 2 and 3 images	:	Displayed on a split screen, when the pushbutton is pressed after Camera 1's image has been displayed.
Standby	:	If no action has been taken for 5 min, the screen goes blank and remains on standby.

Note: An entry request, performed on the keypad within 30 s following an earlier entry request, will not lead to the automatic selection of Camera 1, since the flight crew is given authority to select any desired camera image via the cockpit door video pushbutton. After these 30 s, the system reverts to its normal operation.

Ident.: DSC-52-30-30-10-00019218.0004001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO



(1) LWR ECAM knob

CKPT ENTRY	:	The lower ECAM display displays the camera 1 image.

The camera images are not displayed on the Lower ECAM display in the case of:
- A subsequent automatic system page call following a warning, caution or advisory, or
- A subsequent manual selection of a system page on the ECAM Control Panel (ECP), or
- A SD failure, or
- An E/WD failure.

OFF	:	The lower ECAM display operates normally.

(2) LWR ECAM CAM SEL pushbutton

Selects various camera image displays, when the LWR ECAM knob is set to the CKPT ENTRY position.

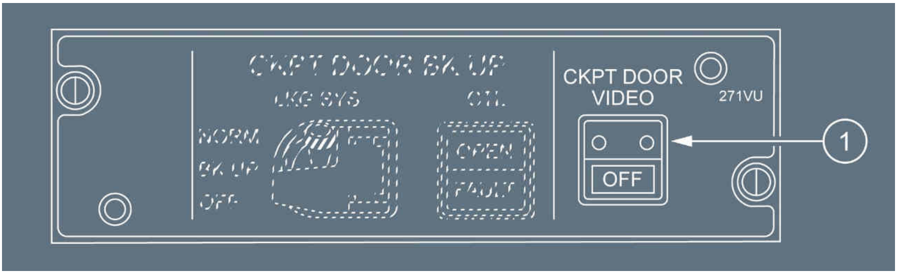
The image from camera 1 appears:
- Automatically, when the LWR ECAM knob is set to the CKPT ENTRY position
- When images from cameras 2 and 3 are displayed, and after the flight crew presses the LWR ECAM CAM SEL pushbutton
- Automatically, when images from cameras 2 and 3 are displayed, and after a crew member uses the cabin keypad to make an entry request at least 30 s after a previous entry request.

Images from cameras 2 and 3 are displayed simultaneously on a split screen, when the image from camera 1 is displayed, and after the flight crew presses the LWR ECAM CAM SEL pushbutton.

Note: *1. The message “PLEASE WAIT” is displayed during the transition between two video images when the flight crew requests an image change.*
2. The message “VIDEO NOT AVAIL” is displayed when the flight crew selects a video image change and no video image can be displayed.

Ident.: DSC-52-30-30-10-00000169.0001001 / 20 MAR 17
Applicable to: ALL

OVERHEAD PANEL


CKPT DOOR SW UP
LKG SYS
CTL
NORM
SW UP
OFF
OPEN
FAULT
CKPT DOOR VIDEO
271VU
OFF
1

(1) Cockpit Door Video pushbutton

OFF: The Cockpit Door Surveillance System is manually de-energized.

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HOW TO OPERATE THE COCKPIT DOOR

Ident.: DSC-52-40-00020452.0001001 / 17 MAR 17
Applicable to: ALL

The secured cockpit door operation is controlled by a toggle sw that is located on the COCKPIT DOOR panel (central pedestral).

DOOR OPENING FROM THE COCKPIT

To enable access to the cockpit, set and maintain the COCKPIT DOOR sw to the UNLOCK position until the door is fully opened. When the door is fully opened, the COCKPIT DOOR sw can be released to the NORM position.

DOOR CLOSING FROM THE COCKPIT

Close the door and check that the OPEN indicator goes off. If the COCKPIT DOOR sw is in the NORM position, the door is locked and emergency access is possible from the cabin. When the door is fully closed, if the cockpit door FAULT light is ON, *Refer to PRO-ABN-DOOR [QRH] COCKPIT DOOR FAULT*

Note: *If the OPEN indicator is ON when the door is closed, the door may be unlocked. Repeat the above-mentioned opening/closing procedure.*

When the COCKPIT DOOR sw is in the LOCK position the door is locked. In this position, the emergency access, the buzzer, and the keypad are inhibited for a preselected time (5 to 20 min).

ROUTINE ACCESS TO THE COCKPIT FROM THE CABIN (I.E. NORMAL ACCESS)

To request access to the cockpit from the cabin, use the keypad to enter the code and validate with the "#" key.

L2 The Operator defines this code (between 0 and 7 digits).

L1 The buzzer sounds in the cockpit for 1 to 9 s (3 s by default).
After identification of the person (using the Cockpit Door Surveillance System ◁) that requests access, set the COCKPIT DOOR sw to UNLOCK position to unlock the door. A steady green light on the keypad comes on, that indicates that the door is unlocked.
If the flight crew refuses access to the cockpit by setting the COCKPIT DOOR sw to LOCK position, a steady red light on the keypad comes on, that indicates that the door is locked. The keypad and the buzzer are inhibited for a defined period of time.
If the flight crew does not respond, the door remains locked. If the flight crew does not take any action after a routine cabin request, the cabin crew will be able to open the door with the emergency access procedure.

EMERGENCY ACCESS FROM CABIN TO THE COCKPIT

To request emergency access to the cockpit, use the keypad to enter the emergency code and validate with the "#" key.

L2 The Operator defines this emergency code (between 2 and 7 digits).

L1 The buzzer continuously sounds in the cockpit and the OPEN light flashes on the COCKPIT DOOR panel (central pedestal). In the cabin, the green light on the keypad flashes until the flight crew uses the COCKPIT DOOR sw to either lock or unlock the cockpit door.
After identification of the person (via the Cockpit Door Surveillance system) that requests access, use the COCKPIT DOOR sw to unlock the door.
If the flight crew refuses access by setting the COCKPIT DOOR sw to LOCK position, the keypad and the buzzer are inhibited for a defined period of time.
If the flight crew does not respond, after a preselected time between 15 and 120 s, the door automatically unlocks for 5 s and a steady green light on the keypad comes. The buzzer stops and indicates that the door is unlocked.

EVACUATION THROUGH THE DECOMPRESSION AND EVACUATION PANEL

Pull the quick-release pins of the escape panel towards the center of the flap. Kick the escape panel toward the cabin and evacuate the cockpit.

HOW TO OPERATE THE FWD AND AFT CARGO DOOR

Ident.: DSC-52-40-00020423.0001001 / 28 MAY 20
Applicable to: ALL

NORMAL OPERATION

OPENING

On the cargo door, push the handle flap inward to release the door handle from the catch of the door structure. Then, pull the door handle away and upward from the LOCKED to the UNLOCKED position.

Note: *All indicator flags at the lower section of the door move out from the door contour. These flags provide a visual indication that the cargo door is unlocked.*

Check the differential pressure before the operation of the latching handle.

WARNING	Before operating the latching handle, check the differential pressure. If the red indicator light flashes, do not open the cargo door as an overpressure may exist in the cargo hold.

To unlatch the cargo door, first press the pushbutton on the latching handle, then pull the handle down to the UNLATCHED position.
Open the access door of the door service panel to get access to the selector valve lever. Set the selector valve lever to the OPEN position and maintain the lever in this position until the green indicator light comes on. The green indicator light indicates that the door is fully open and locked.

Note: *The yellow hydraulic system is pressurized (the YELLOW ELEC PUMP is energized). The operation of the flight controls is inhibited.*

When the cargo door is fully open, release the selector valve lever. When released, the lever returns to the neutral (STOP) position and shuts down the electrical pump after 10 s.

CAUTION	Check that the lever is in the neutral position and the pump operation has stopped. Continuous operation of the electrical pump leads to overheat.

CLOSING

To close the cargo door, set the selector valve lever to the CLOSE position and maintain the lever in this position until the green indicator light goes off. This indicates that the door is fully closed and locked.

Note: *At first the selector valve lever locks in an intermediate position, maintaining a preset pressurization to prevent the door from dropping open.*

When the door is fully closed, release the selector valve lever. The lever returns to the neutral position and shuts down the yellow hydraulic electrical pump.

Note: *Release the lever within 1 min after door closure.*

On the cargo door, push the latching handle back into its cavity. Push the door locking handle downward to the LOCKED position.
When the door is locked, the CARGO door indication on the ECAM goes off, and the handle flap mechanism locks the operating handle.
Close the access door of the door service panel.

HOW TO OPERATE THE FWD AND AFT CARGO DOORS (AUXILIARY OPERATION)

Ident.: DSC-52-40-00020425.0002001 / 17 MAR 17
Applicable to: ALL

AUXILIARY OPERATION

In case of an electrical failure or if the yellow hydraulic electric pump fails, the operator can open or close the forward and the aft cargo doors by using the hand pump which is accessible via the ground service panel.

Note: *Two persons are necessary for this operation.*

MANUAL OPENING

To open the cargo door by using the hand pump, unlock the cargo door by using the operating handle as for normal operation.
Open the yellow hydraulic ground service panel that is located in the belly fairing area. Ensure that the selector valve lever is in the CLOSE position.

Open the access door of the door service panel. Set the selector valve lever to the OPEN position and maintain the lever in this position during the operation of the hand pump.
Operate the hand pump until the cargo door is in the fully open position.
When the cargo door is fully open the green light on the door service panel comes on, or the operation of the hand pump suddenly becomes difficult.
Release the selector valve lever of the door service panel. Then, set the selector valve lever (of the ground service panel) to the OPEN position.

MANUAL CLOSING

To close the cargo door, set the selector valve lever (on the door service panel) to the CLOSE position and maintain the lever in this position.
Operate the hand pump until the cargo door is in the fully closed position.
When the cargo door is fully closed, release the lever of the manual selector valve of the door service panel.
Lock the cargo door by using the operating handle as for normal operation.
Close the access door of the door service panel and of the ground service panel.

HOW TO OPERATE THE BI-FOLDING LAVATORY DOOR IN EMERGENCY OPERATION

Ident.: DSC-52-40-00020454.0001001 / 05 JAN 21
Applicable to: ALL

Refer to CCOM/03-080-50-30 How to Open and Remove a Bi-folding Door from the Outside when Locked

HOW TO LEAVE THE AIRCRAFT VIA THE ACCESS DOOR IN THE AVIONICS BAY

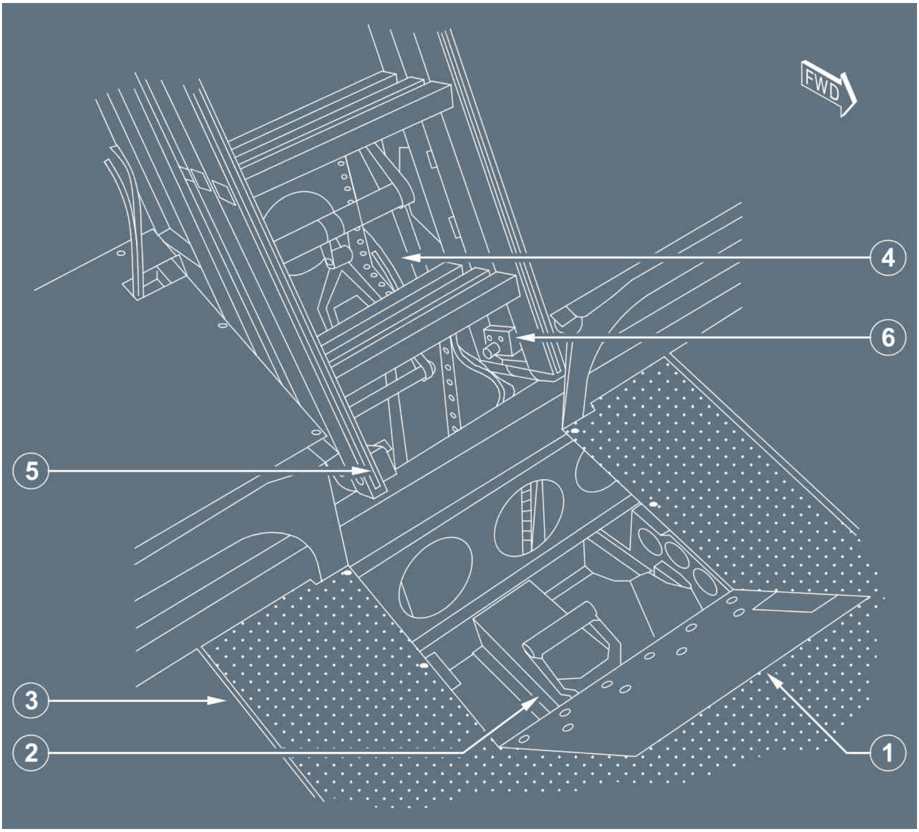
Ident.: DSC-52-40-00020453.0001001 / 17 MAR 17
Applicable to: ALL

In order to open the floor hatch to get access to the avionics bay, move entirely forward the captain seat. Then, descend into the avionics bay and take a position on the right side of the access door that is located in the avionics bay.

Note: *Do not try to open the access door while standing on it.*

When inside the avionics bay, open the floor panel (1) which covers the avionics bay access door handle (2), located at the aft, center part of the access door (coin may be needed to open the lock).
In order to open the access door (3), lift the handle (2) and pull the door completely into the bay until it is latched in its upper stop (LH).
Then, remove the strap which fixes the ladder assembly against motion. Lift the lever (4), located on the right side aft of the lower rung of the aft ladder element, to unlock the ladder assembly and swing it simultaneously towards the opening.

Release the lower locking device on the right inner side of the first ladder element (5) by pulling the orange handle forward (indicated on a placard next to the locking device). Then lower the element until it latches.
Repeat the above steps with the second ladder element (locking device (6) is at the left inner side).
If the ladder does not touch the ground yet, the last element is lowered by pulling forward its orange handle at the lower end on the left outer side.
If the ladder touches the ground leave the aircraft via the extended ladder.



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ERRONEOUS ACTIVATION OF THE CABIN PRESSURE WARNING LIGHTS WITHOUT RESIDUAL DIFFERENTIAL PRESSURE

Ident.: DSC-52-100-00023965.0001001 / 02 DEC 19
Applicable to: ALL

DESCRIPTION

At touchdown, the CPCS automatically operates the opening of the OFV to reduce the differential pressure to a safe level, even when both packs are operating.
However the differential pressure sensor may have a defect. The CABIN PRESSURE WARNING lights may temporarily come on without residual differential pressure. In that case, the CAB PR EXCESS RESIDUAL PR alert may not trigger.
This erroneous activation of the CABIN PRESSURE WARNING lights can last up to 30 min.

OPERATIONAL RECOMMENDATION

Before the cabin crew opens the cabin door, the flight crew must confirm the absence of residual differential pressure. The flight crew must wait for CABIN PRESSURE WARNING lights to stop flashing, or perform both of the following actions:

- Check that both air conditioning packs are set to OFF, and
- Open one of the cockpit sliding windows.

If the flight crew cannot open one of the cockpit sliding windows, it means that residual pressure remains. Therefore the cabin doors MUST NOT BE OPENED. In this case, the flight crew may regularly try to open the cockpit sliding window, to confirm the absence of residual pressure.
If the flight crew can open one of the sliding windows, the flight crew can consider the CABIN PRESSURE WARNING lights as spurious. The flight crew can therefore order the cabin crew to open the cabin doors.

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AIRCRAFT SYSTEMS

COCKPIT WINDOWS

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DSC-56-10 General

General....................A

DSC-56-20 Fixed Windows

Fixed Windows....................A

DSC-56-30 Sliding Windows

Sliding Windows....................A

DSC-56-40 Description

Description....................A

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GENERAL

Ident.: DSC-56-10-00000109.0001001 / 17 MAR 17
Applicable to: ALL

The cockpit has fixed and sliding windows.

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FIXED WINDOWS

Ident.: DSC-56-20-00000116.0001001 / 17 MAR 17
Applicable to: ALL

There are four fixed windows :
- two windshields
- two fixed side windows

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SLIDING WINDOWS

Ident.: DSC-56-30-00000122.0001001 / 09 OCT 12
Applicable to: ALL

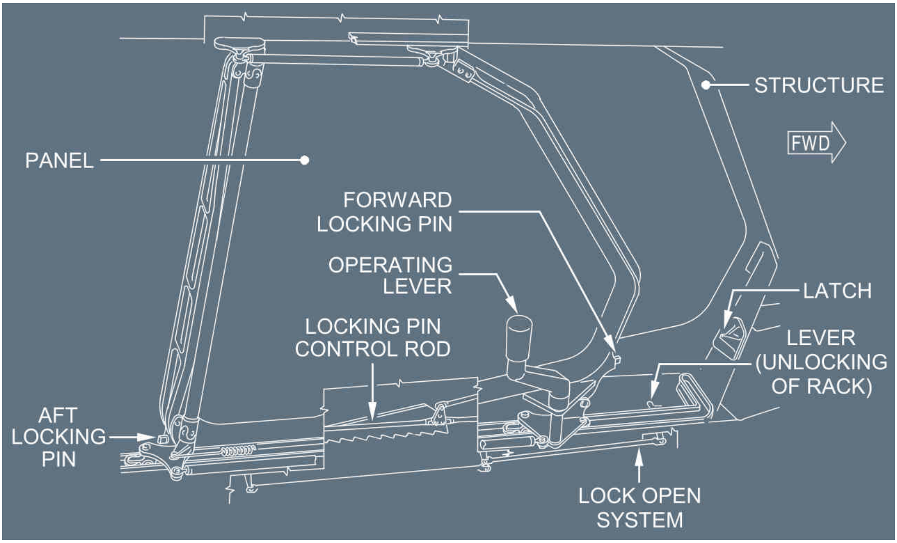
The flight crew can use the sliding window as emergency exits. Therefore they are not permitted to stow any object so that it protrudes into the window area from the side console.
Each sliding window includes a panel which as an anti-icing and defogging system, and the opening and closing mechanism.

OPENING MECHANISM

Fully press the operating lever to disengage the locking pins from their latches.
Rotate aft the operating lever to free the window panel from its fixed structure.
At the end of the operating lever travel, pull backwards to slide the window panel aft.
Move control lever forward lock the window.

CLOSING MECHANISM

Move control lever aft unlock the window.
Push operating lever forward until the panel is in position opposite its fixed frame.
Rotate the operating lever forward to move the panel into its frame and engage the locking pins in their latches.


STRUCTURE
FWD
PANEL
FORWARD LOCKING PIN
OPERATING LEVER
LATCH
LOCKING PIN CONTROL ROD
LEVER (UNLOCKING OF RACK)
AFT LOCKING PIN
LOCK OPEN SYSTEM

Intentionally left blank

DESCRIPTION

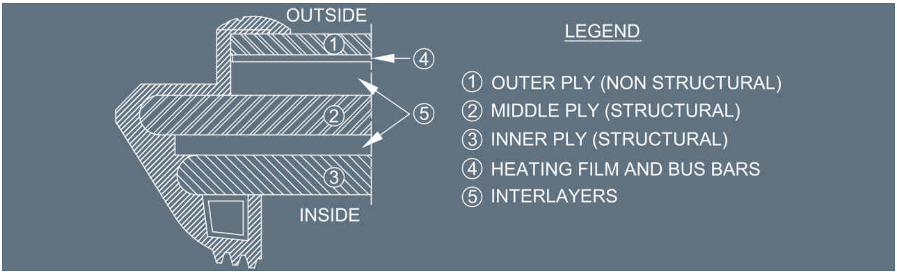
Ident.: DSC-56-40-00013842.0001001 / 17 MAR 17
Applicable to: ALL

COCKPIT WINDSHIELD AND WINDOWS DESCRIPTION

All cockpit windows are fail-safe design.
The windows are made of:

- A non structural ply, the Outer ply (1), which is only a protective layer
- Two structural plies, the Middle ply (2) and the Inner ply (3)
  Each structural ply is able to sustain individually the pressurization loads
- A heating film (4) to defog and/or de-ice the windshield/window
- Two interlayers (5).

Typical Structure Of A Cockpit Window (Cut View)


OUTSIDE
①
④
②
⑤
③
INSIDE
LEGEND
① OUTER PLY (NON STRUCTURAL)
② MIDDLE PLY (STRUCTURAL)
③ INNER PLY (STRUCTURAL)
④ HEATING FILM AND BUS BARS
⑤ INTERLAYERS

For information on cockpit window damage procedure, description and evaluation method, *Refer to FCTM/PR-AEP-MISC Cockpit Windshield/Window Cracked*.

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AIRCRAFT SYSTEMS

ENGINES

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DSC-70-05 Overview

Overview.......... A

DSC-70-10 System Description

DSC-70-10-10 Engine

Engine.......... A

DSC-70-20 FADEC

General.......... A
Schematic.......... B
Functions.......... C

DSC-70-30 Thrust Control System (CFM, GE, TRENT-7000)

DSC-70-30-10 General

General.......... A

DSC-70-30-30 Thrust Levers

General.......... A
Manual Mode.......... B
Thrust Bump.......... C
Engagement-Disengagement.......... D
Activation-Deactivation.......... E

DSC-70-30-40 Thrust Rating Limit

General.......... A
Automatic Mode.......... B

DSC-70-35 Thrust Control System (PW, TRENT-500, TRENT-700)

DSC-70-35-10 General

General.......... A

DSC-70-35-20 Engine Power Setting

General.......... A
EPR Mode.......... B
N1 Mode.......... C
EPR Recovery Logic.......... D

DSC-70-35-30 Thrust Levers

Thrust Levers.......... A

DSC-70-35-40 Thrust Rating Limit

Thrust Rating Limit.......... A

Continued on the following page

Continued from the previous page

DSC-70-35-50 Thrust Control

Manual Mode.......A
Automatic Mode.......B

DSC-70-40 Fuel System

DSC-70-40-10 General

General.......A

DSC-70-40-20 Fuel Pump Unit / Main Engine Pump

Main Engine Pump.......A
Fuel Pump Unit.......B

DSC-70-40-30 Shutoff Valves

Shutoff Valves.......A

DSC-70-40-40 Hydromechanical Unit / Fuel Metering Unit

General.......A
Fuel Flow.......B
Overspeed Protection.......C
Idle Control.......D
Fuel Hydraulic Signals.......E

DSC-70-40-50 IDG Oil Cooling System

General.......A

DSC-70-50 Oil System

General.......A

DSC-70-60 Airbleed System

General.......A
Cooling.......B
Engine Stability.......C

DSC-70-70 Thrust Reverser System

General.......A
Actuation Logic.......B
Protection.......C
Schematic.......D

Continued on the following page

Continued from the previous page

DSC-70-80 Ignition and Starting

DSC-70-80-10 General

General....A
Architecture....B

DSC-70-80-20 Ignition System

General....A
Ignition for Starting....B
Continuous Ignition....C
Windmilling Quick Relight Function....D

DSC-70-80-30 Engine Starting System

General....A
Automatic Starting....B
Automatic Starting Sequence....C
Manual Starting....D
Engine Ventilation (Dry Cranking)....E

DSC-70-80-40 Alternate Start/Ignition Information

Alternate Start/Ignition Information....A

DSC-70-90 Controls and Indicators

DSC-70-90-10 Overhead Panel

ENG N1 MODE Panel....A
ENG MAN START Panel....B

DSC-70-90-20 Pedestal

ENG START Selector and ENG MASTER Levers....A
Thrust Levers....B

DSC-70-90-30 Maintenance Panel

ENG FADEC GND PWR Panel....A

DSC-70-90-40 Engine Display

Engine/Warning Display....A
ENG SD Page....B

DSC-70-100 Temporary Abnormal Behaviors

Erroneous engine fuel leak detection....A

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OVERVIEW

Ident.: DSC-70-05-10-00018999.0005001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

The aircraft has two Rolls-Royce Trent 700 engines that supply power to the aircraft.

Ident.: DSC-70-05-10-00018999.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

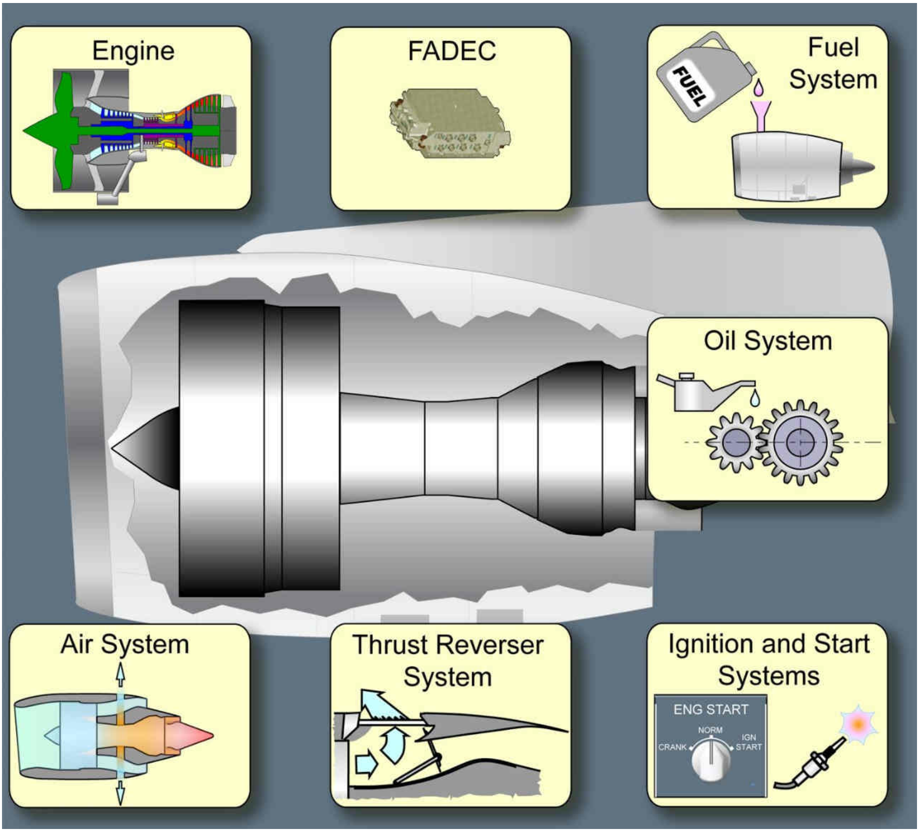
The aircraft has two General Electric CF6-80E1 engines that supply power to the aircraft.

Ident.: DSC-70-05-10-00019000.0001001 / 21 MAR 16
Applicable to: ALL

The engines are turbofan engines that have:

- A high bypass ratio,
- A Full Authority Digital Engine Control (FADEC),
- A fuel system,
- An oil system,
- An air system,
- A thrust reverser system,
- An ignition system and a start system.

Overview


Engine
FADEC
FUEL
Fuel System
Oil System
Air System
Thrust Reverser System
Ignition and Start Systems
ENG START
NORM
CRANK
IGN START

ENGINE

Ident.: DSC-70-10-10-10-00019001.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

The engine has:

- Three compressor turbine assemblies:
  - The Low Pressure (LP) compressor turbine assembly,
  - The Intermediate Pressure (IP) compressor turbine assembly,
  - The High Pressure (HP) compressor turbine assembly.

L2 Each turbine operates its associated compressor via a shaft.

L1
- One accessory gearbox,
- One combustion chamber.

The engine operates as follows:

1. The LP compressor, referred to as the fan, compresses the air.
2. Then, the air is divided into two flows:
   - Most of the air flows out of the core engine, and provides most of the engine thrust,
   - The remaining air enters the core engine.
3. The IP and the HP compressors compress the air that enters the core engine.
4. The fuel is added to and mixed with the compressed air of the core engine. The mixture is ignited in the combustion chamber.
5. The gas that results from combustion drives the HP, the IP, and the LP turbines.

The rotation speed of the fan provides the N1 engine parameter.
The rotation speed of the IP rotor provides the N2 engine parameter.
The rotation speed of the HP rotor provides the N3 engine parameter.
The N1 and N3 engine parameters appear on the Engine/Warning Display (E/WD).
The N2 engine parameter appears on the ENG SD page.
L2 The N1, N2 and N3 engine parameters are current rotation speeds displayed in percentage.
L1 The FADEC uses:

- The N1 engine parameter to compute the applicable engine thrust,
- The N1, N2 and N3 engine parameters for engine control and monitoring.

Ident.: DSC-70-10-10-10-00019001.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The engine has:

- Two compressor turbine assemblies:
  - The Low Pressure (LP) compressor turbine assembly,
  - The High Pressure (HP) compressor turbine assembly.

L2 Each turbine operates its associated compressor via a shaft.

L1
- One accessory gearbox,
- One combustion chamber.

The engine operates as follows:

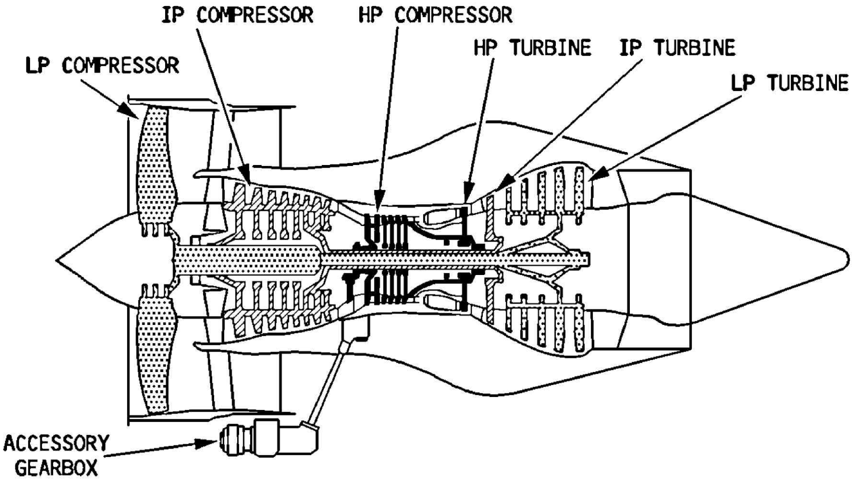
1. The LP compressor compresses the air
2. Then, the air is divided into two flows:
   - Most of the air flows out of the core engine, and provides most of the engine thrust,
   - The remaining air enters the core engine.
3. The HP compressor compresses the air that enters the core engine.
4. The fuel is added to and mixed with the compressed air of the core engine. The mixture is ignited in the combustion chamber.
5. The gas that results from combustion drives the HP and the LP turbines.

The rotation speed of the fan provides the N1 engine parameter.
The rotation speed of the HP rotor provides the N2 engine parameter.
The N1 and N2 engine parameters appear on the Engine/Warning Display (E/WD).
L2 The N1 and N2 engine parameters are current rotation speeds displayed in percentage.
L1 The FADEC uses:

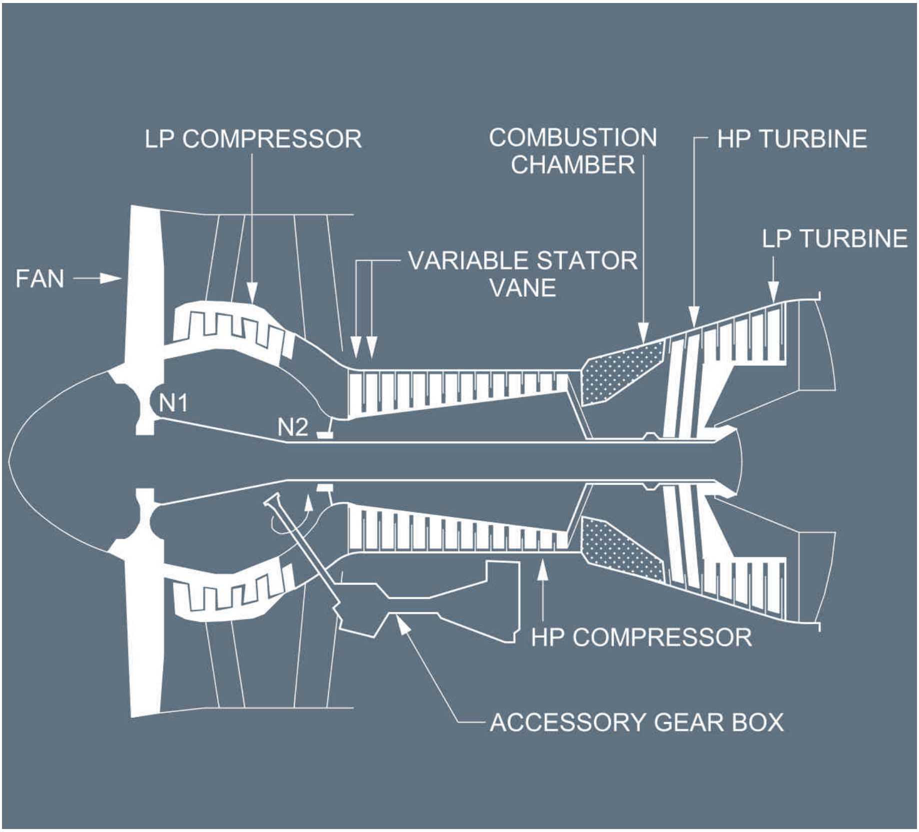
- The N1 engine parameter to compute the applicable engine thrust,
- The N1 and N2 engine parameters for engine control and monitoring.

Ident.: DSC-70-10-10-10-00019003.0005001 / 21 MAR 16

Applicable to: LV-KHT, LV-KHU


IP COMPRESSOR
HP COMPRESSOR
HP TURBINE
IP TURBINE
LP COMPRESSOR
LP TURBINE
ACCESSORY GEARBOX

Ident.: DSC-70-10-10-10-00019003.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


LP COMPRESSOR
COMBUSTION CHAMBER
HP TURBINE
LP TURBINE
FAN
VARIABLE STATOR VANE
N1
N2
HP COMPRESSOR
ACCESSORY GEAR BOX

Ident.: DSC-70-10-10-10-00019004.0005001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

LP COMPRESSOR TURBINE ASSEMBLY

The LP compressor turbine assembly has:

- One LP compressor, referred to as the fan,
- L2 One LP shaft,
- L1 One LP turbine.

L2 The LP shaft connects the fan to the LP turbine.

L3 The LP compressor (fan) has a single stage, and the LP turbine has 4 stages.

Ident.: DSC-70-10-10-10-00019004.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

LP COMPRESSOR TURBINE ASSEMBLY

The LP compressor turbine assembly has:

- One LP compressor,
- L2 One LP shaft,
- L1 One LP turbine.

L2 The LP shaft connects the LP compressor to the LP turbine.
L3 The LP compressor has a fan and 4 stages, and the LP turbine has 5 stages.

Ident.: DSC-70-10-10-10-00019005.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

IP COMPRESSOR TURBINE ASSEMBLY

The IP compressor turbine assembly has:

- One IP compressor,
- L2 One IP shaft,
- L1 One IP turbine.

L2 The IP shaft connects the IP compressor to the IP turbine.
L3 The IP compressor has 8 stages, and the IP turbine has a single stage.
To optimize and protect the operation of the engine at all power settings and in all flight conditions, the Variable Inlet Guide Vanes (VIGVs) and the Variable Stator Vanes (VSVs) regulate the quantity of air that flows through the IP compressor.

Ident.: DSC-70-10-10-10-00019006.0004001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

HP COMPRESSOR TURBINE ASSEMBLY

The HP compressor turbine assembly has:

- One HP compressor,
- L2 One HP shaft,
- L1 One HP turbine.

L2 The HP shaft connects the HP compressor to the HP turbine.
L3 The HP compressor has 6 stages, and the HP turbine has a single stage.

Ident.: DSC-70-10-10-10-00019006.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

HP COMPRESSOR TURBINE ASSEMBLY

The HP compressor turbine assembly has:

- One HP compressor,
- L2 One HP shaft,
- L1 One HP turbine.

L2 The HP shaft connects the HP compressor to the HP turbine.
L3 The HP compressor has 14 stages, and the HP turbine has two stages.

Ident.: DSC-70-10-10-10-00019007.0001001 / 21 MAR 16
Applicable to: ALL

COMBUSTION CHAMBER

The combustion chamber burns a mixture of fuel and HP air.
The FADEC controls the fuel/air mixture in accordance with the position of the thrust lever and the aircraft operating conditions.
L3 The combustion chamber is an annular assembly with fuel nozzles and two igniters. The combustion chamber is between the HP compressor and the HP turbine.

Ident.: DSC-70-10-10-10-00019008.0001001 / 21 MAR 16
Applicable to: ALL

ACCESSORY GEARBOX

The accessory gearbox drives various accessories with mechanical power via the HP shaft for the operation of the engine and the aircraft systems.
L2 The accessory gearbox of each engine operates:

- The oil feed pump that provides the oil system with oil.
- The main engine fuel pump that provides the combustion chamber with fuel.
- The engine-driven hydraulic pumps that pressurize the GREEN, the BLUE and the YELLOW hydraulic systems.
- The engine-driven generators that are the primary source of electrical power.
- The FADEC alternator that provides the FADEC with electrical power.
- The pneumatic starter that enables the engine start.

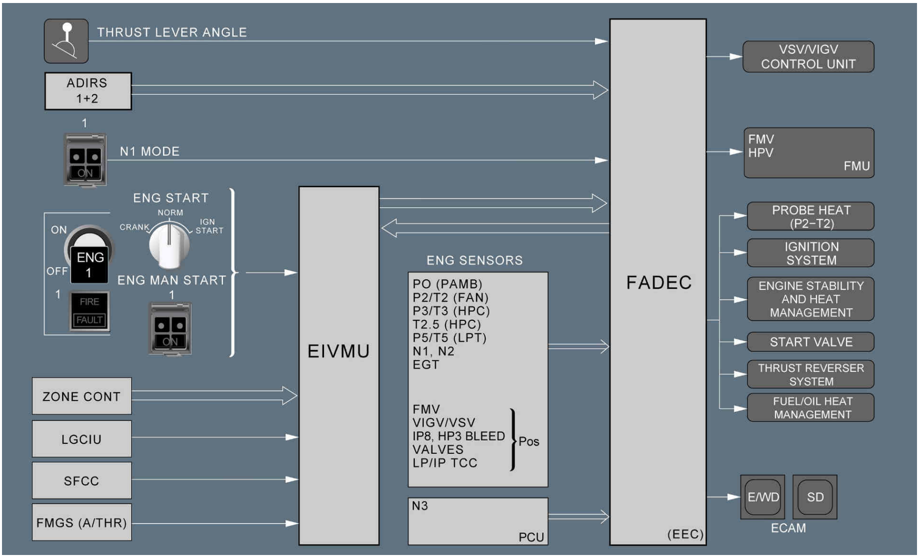
GENERAL

Ident.: DSC-70-20-00020632.0001001 / 17 MAR 17
Applicable to: ALL

Each powerplant has a FADEC (Full Authority Digital Engine Control) system.
FADEC is a digital control system that performs complete engine management.
FADEC has two-channel redundancy, with one channel active and one standby.
If one channel fails, the other automatically takes control.
The system has a magnetic alternator for an internal power source.
FADEC is mounted on the fan case.
The Engine Interface Unit (EIVMU/EIU) transmits the data it uses for engine management to the FADEC.

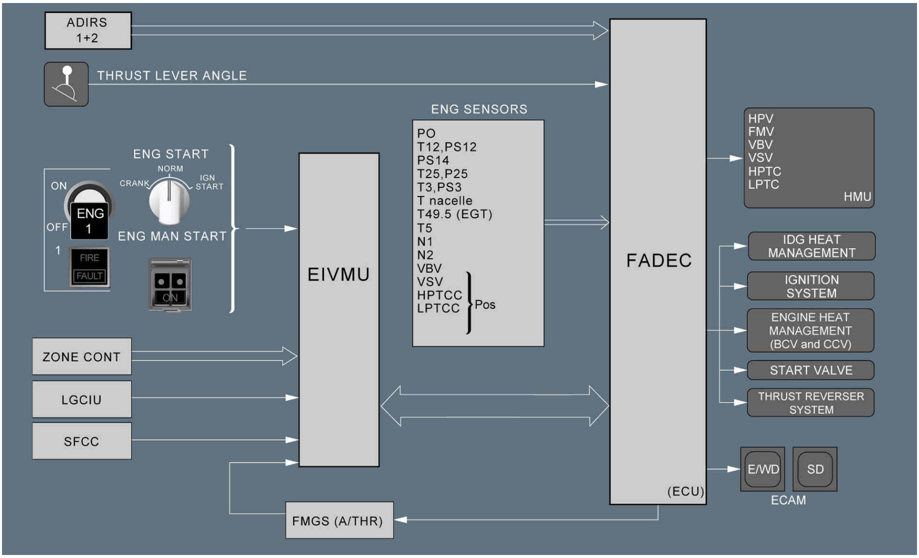
SCHEMATIC

Ident.: DSC-70-20-00020633.0004001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU


THRUST LEVER ANGLE
ADIRS 1+2
1
N1 MODE
ON
ENG START
NORM
CRANK
IGN START
ON
OFF
ENG 1
1
FIRE
FAULT
ENG MAN START
1
ON
ZONE CONT
LGCIU
SFCC
FMGS (A/THR)
EIVMU
ENG SENSORS
PO (PAMB)
P2/T2 (FAN)
P3/T3 (HPC)
T2.5 (HPC)
P5/T5 (LPT)
N1, N2
EGT
FMV
VIGV/VSV
IP8, HP3 BLEED
VALVES
LP/IP TCC
Pos
N3
PCU
FADEC
(EEC)
VSV/VIGV CONTROL UNIT
FMV
HPV
FMU
PROBE HEAT (P2–T2)
IGNITION SYSTEM
ENGINE STABILITY AND HEAT MANAGEMENT
START VALVE
THRUST REVERSER SYSTEM
FUEL/OIL HEAT MANAGEMENT
E/WD
SD
ECAM

SCHEMATIC

Ident.: DSC-70-20-00020633.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


ADIRS 1+2
THRUST LEVER ANGLE
ENG SENSORS
PO
T12,PS12
PS14
T25,P25
T3,PS3
T nacelle
T49.5 (EGT)
T5
N1
N2
VBV
VSV
HPTCC
LPTCC
Pos
ENG START
NORM
CRANK
IGN START
ON
OFF
ENG 1
1
FIRE
FAULT
ENG MAN START
ON
EIVMU
FADEC
(ECU)
HPV
FMV
VBV
VSV
HPTC
LPTC
HMU
IDG HEAT MANAGEMENT
IGNITION SYSTEM
ENGINE HEAT MANAGEMENT (BCV and CCV)
START VALVE
THRUST REVERSER SYSTEM
E/WD
SD
ECAM
ZONE CONT
LGCIU
SFCC
FMGS (A/THR)

FUNCTIONS

Ident.: DSC-70-20-00020634.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The FADEC system performs the following functions:

Control of gas generation

- Control of fuel flow
- Acceleration and deceleration schedules
- Variable bleed valve and variable stator vane schedules
- Control of turbine clearance
- Idle setting

Protection against engine exceeding limits

- Protection against N1 and N2 overspeed
- Monitoring of EGT during engine start

Power management

- Automatic control of engine thrust rating
- Computation of thrust parameter limits
- Manual management of power, based on thrust lever position
- Automatic power management (A/THR demand)

Automatic engine starting sequence

- Control of the:
  - Start valve
  - HP fuel valve
  - Fuel flow
  - Ignition
- Monitoring of N1, N2, FF and EGT
- Initiation of abort and recycle (on ground only)

Manual engine starting sequence

- Passive monitoring of the engine
- Active protection (on ground only) against high EGT and for starter reengagement speed
- Control of the:
  - Start valve
  - HP fuel valve
  - Ignition

Thrust reverser control

- Actuation of the blocker cowls
- Engine setting during reverser operation

Transmission of engine parameters and engine monitoring information to cockpit indicators

- The primary engine parameters
- The starting system status
- The thrust reverser system status
- The FADEC system status
- Secondary engine parameters (oil temperature, nacelle temperature, oil filter clog and fuel filter clogging)

Fuel used Computation

Fuel flow integration

Management of engine heat

Control of the core compartment cooling valve

Management of IDG heat

Control of the IDG air/oil heat exchanger air valve

Failure detection, isolation and recording

FUNCTIONS

Ident.: DSC-70-20-00020634.0010001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

The FADEC system performs the following functions:

Control of gas generation

- Control of fuel flow
- Acceleration and deceleration schedules
- Variable stator vanes variable inlet guide vanes, and IP/HP bleed valve schedules
- Control of turbine clearance
- Idle setting.

Protection against engine exceeding limits

- Protection against N1 and N2 overspeed (controlled by the overspeed protection unit)
- Turbine overspeed
- Monitoring of EGT during engine start on ground.

Power management

- Automatic control of engine thrust rating
- Automatic reversion to N1 mode
- Computation of thrust parameter limits
- Manual management of power, based on thrust lever position
- Automatic management of power (A/THR demand).

Automatic engine starting sequence

- Control of:
  - The start valve
  - The HP fuel valve
  - The fuel flow
  - The ignition
- Monitoring of N1, N3, FF and EGT
- Initiation of abort and recycle (on ground only)
- Auto relight and quick relight functions.

Manual engine starting sequence

- Passive monitoring of the engine
- Control of:
  - The start valve
  - The HP fuel valve
  - The ignition.

Thrust reverser control

- Actuation of the blocker cowls
- Engine setting during reverser operation.

Transmission of engine parameters and engine monitoring information to cockpit indicators

- The primary engine parameters
- The starting system status
- The thrust reverser system status
- The FADEC system status
- Secondary engine parameters (oil temperature, nacelle temperature, oil filter clog and fuel filter clogging).

Computation of fuel used

Integration of fuel flow.

Management of engine heat

Control of turbine case, bearing and gearbox cooling.

Cooling of FADEC

Detection, isolation and recording of failures

Protection against fan stall

- Modified Engine Acceleration Schedule for Take Off (MEASTO): A logic that ensures a progressive thrust is automatically set during the takeoff roll. Engine acceleration is controlled with an “EPR/second” rate in EPR mode
- Stall recovery logic: When a fan stall is detected, a recovery logic is triggered which consists of a fuel flow reduction and Variable Stator Vanes repositioning. The protection is active until the thrust lever is moved as per ECAM procedure.

Keep out zone logic

To prevent fan instability, this logic avoids stabilized engine operation between the 1.16 to 1.28 EPR range (in N1 rated mode, the keep-out zone depends on the ambient conditions), when on ground with an aircraft speed below 80 kt.

Protection against Intermediate Pressure Turbine overspeed

In the case of an Intermediate Pressure Turbine overspeed, the Intermediate Pressure Turbine Overspeed System (IPTOS) either automatically limits the engine thrust to 30 % of the maximum takeoff thrust, or automatically shuts down the affected engine. This is to protect the system integrity of the Intermediate Pressure Turbine. The IPTOS protection remains active on the affected engine for the remainder of the flight. In the case of one engine inoperative in flight, the IPTOS protection is automatically inhibited on the remaining engine (when the thrust lever is set to, or above, MCT for at least 4 s).

GENERAL

Ident.: DSC-70-30-10-00020655.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

A FADEC dedicated to each engine controls the thrust.
The pilot uses the thrust levers to set the thrust in manual mode, and the FMGS sets the thrust in automatic mode.
The FADEC prevents the thrust from exceeding the limit for the thrust lever position in both manual and automatic modes.

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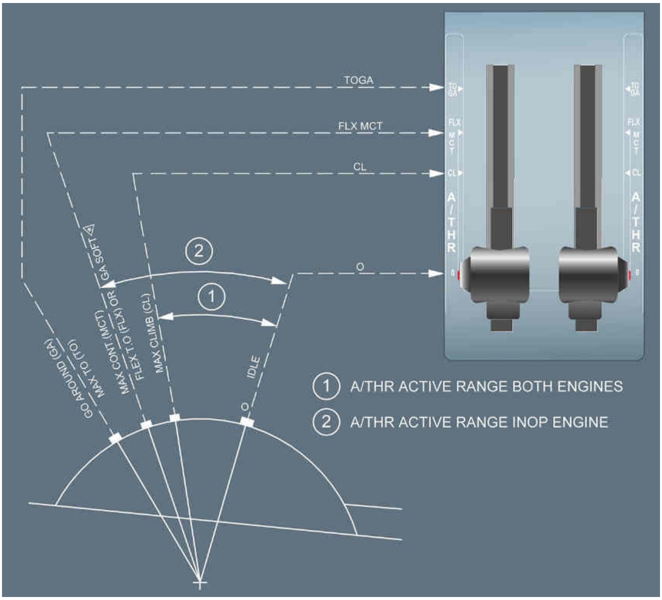
GENERAL

Ident.: DSC-70-30-30-00020636.0002001 / 12 JUL 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


TOGA
FLX MCT
CL
O
TO GA
FLX
MCT
CL
A/THR
GA SOFT
GO AROUND (GA)
MAX TO (TO)
MAX CONT (MCT) OR FLEX T.O (FLX)
MAX CLIMB (CL)
IDLE
O
2
1
1 A/THR ACTIVE RANGE BOTH ENGINES
2 A/THR ACTIVE RANGE INOP ENGINE

The thrust levers can only be moved manually.
The range of movement is divided into 3 operating segments.
The sector has 4 positions defined by detents or stops.
Thrust lever position is transmitted to the FADEC which computes and displays the thrust rating limit and the N1 TLA.

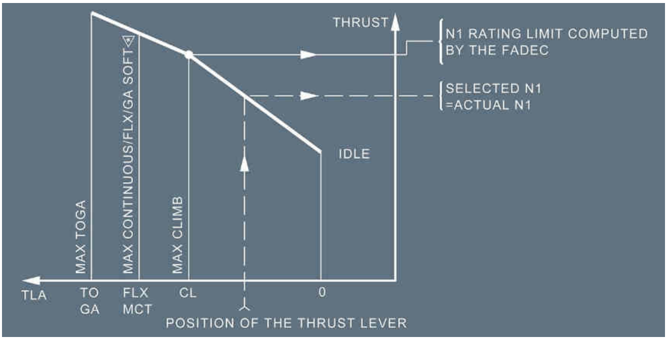
MANUAL MODE

Ident.: DSC-70-30-30-00004787.0001001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The engines are in the manual mode provided the A/THR function is:
- not armed or
- armed and not active (thrust lever not in the A/THR operating range and no alpha floor).

In these conditions, each engine is controlled by the position of its thrust lever.
The flight crew controls the thrust by moving the thrust lever from IDLE to TOGA positions. Each position of the thrust lever within these limits corresponds to an N1.

When the thrust lever is in a detent, the corresponding N1 is equal to the N1 rating limit computed by the FADEC for this engine.


THRUST
N1 RATING LIMIT COMPUTED BY THE FADEC
SELECTED N1 =ACTUAL N1
IDLE
MAX TOGA
MAX CONTINUOUS/FLX/GA SOFT
MAX CLIMB
TLA
TO GA
FLX MCT
CL
0
POSITION OF THE THRUST LEVER

When the thrust lever is in the MCT/FLX detent :

- **On the ground :**
  The engine runs at the flex takeoff thrust rating if the MCDU has selected a flex takeoff temperature that is higher than the current total air temperature (TAT). Otherwise the engine produces maximum continuous thrust (MCT).

  Note: *A change of FLEX TEMP during the takeoff has no effect on the thrust.*

- **After take-off :**
  The flight crew can change from FLX to MCT by moving the thrust lever to TOGA or CL, then back to MCT. After that, the flight crew cannot use the FLX rating.

  Note: *Setting the thrust lever out of MCT/FLX detent without reaching TOGA or CL detent has no effect.*

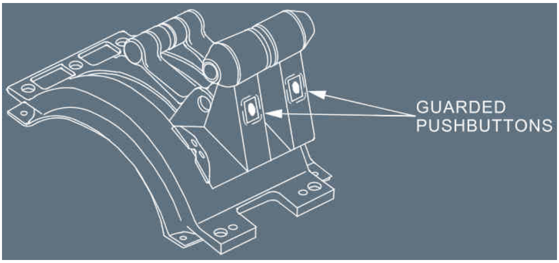
The flight crew can always get MAX TO thrust by pushing the thrust lever all the way forward.
In go-around, the A/THR controls the thrust in accordance with the following thrust lever position:

- At the TOGA detent, the thrust target is the TOGA thrust,
- At the MCT/FLX detent, when TOGA was previously set in the case of soft go-around, the thrust target is one of the following:
  - The thrust to target a vertical speed of approximately 2 000 ft/min, or
  - The maximum thrust (TOGA) if the 2 000 ft/min cannot be reached.

THRUST BUMP

Ident.: DSC-70-30-30-00020643.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

- The thrust bump can be used to obtain an additional thrust capability during takeoff.
- Maximum thrust increase is obtained with the TLA at TOGA position.
- Thrust power is increased by up to 2.5 % (corresponding to an N1 increase up to 1.7 %).
- It is activated by two guarded pushbuttons, that are located on each thrust lever.



- It remains active, in case of one engine failure.

ENGAGEMENT-DISENGAGEMENT

Ident.: DSC-70-30-30-00020790.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

- The thrust bump is engaged by the FADEC, when the following conditions are met:
  - The engines are running (N2 > 50 %)
  - TRA is in the forward thrust region
  - One of the two thrust bump pushbuttons has been pressed.
  - The A/C has been on ground for more than 30 s.
- Disengagement is effective:
  - On ground, by reducing the thrust levers to, or below, MCT
  - On ground, by pressing one of the two bump pushbuttons, if the thrust levers are not at above MCT
  - At engine shutdown.

ACTIVATION-DEACTIVATION

Ident.: DSC-70-30-30-00020791.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

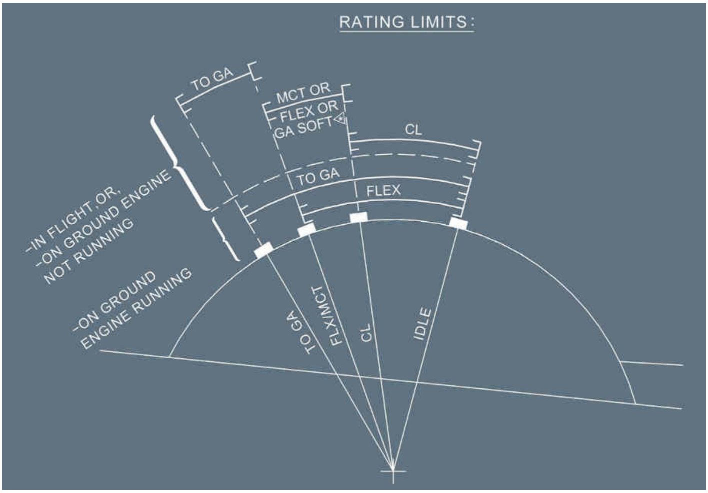
- The thrust bump is activated, when the following condition is met:
  - FLEX takeoff or derated takeoff have not been selected.
- Deactivation occurs:
  - After takeoff, when the thrust lever is at, or below, CLB.

Note:
- *A “B” will appear in green on the right side of the N1 indication, when the bump has been engaged.*
- *The thrust bump is not available, in case of a go-around or touch-and-go.*
- *On ground, once selected, the bump function is engaged for takeoff, when the thrust levers are above MCT. The FADEC will deselect the bump after takeoff, when the thrust lever is at, or below, CLB.*
- *In case of EIVMU failure, after bump engagement, bump condition is maintained in the FADEC.*

GENERAL

Ident.: DSC-70-30-40-00004788.0001001 / 12 JUL 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

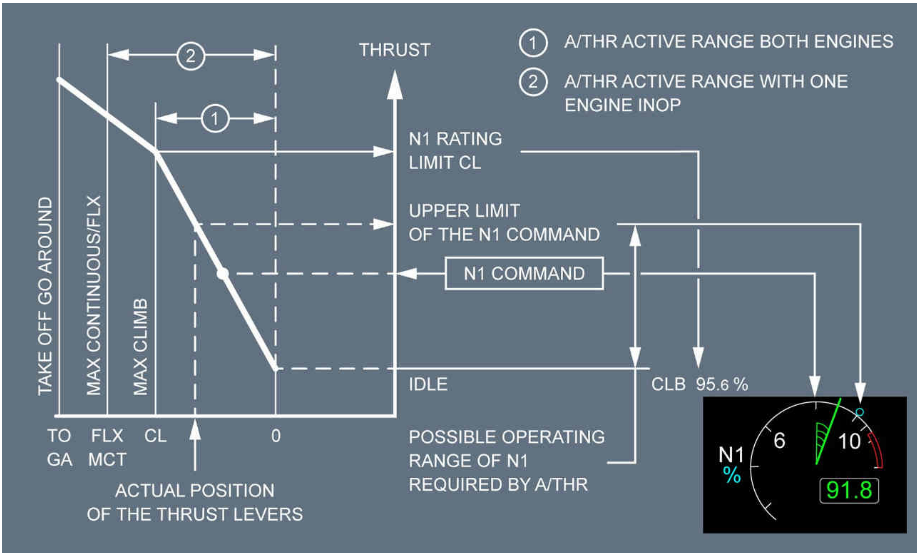
The FADEC computes the thrust rating limit for each thrust lever position, as shown below. If the thrust lever is set in a detent, the FADEC selects the rating limit corresponding to this detent.
If the thrust lever is set between two detents, the FADEC selects the rating limit corresponding to the higher detent.


RATING LIMITS:
TO GA
MCT OR
FLEX OR
GA SOFT ✱
CL
TO GA
FLEX
-IN FLIGHT, OR,
-ON GROUND ENGINE
NOT RUNNING
-ON GROUND
ENGINE RUNNING
TO GA
FLX/MCT
CL
IDLE

AUTOMATIC MODE

Ident.: DSC-70-30-40-00020649.0002001 / 18 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

In the autothrust mode (A/THR function active), the FMGC computes the thrust, which is limited to the value corresponding to the thrust lever position (unless the alpha-floor mode is activated).


① A/THR ACTIVE RANGE BOTH ENGINES
② A/THR ACTIVE RANGE WITH ONE ENGINE INOP
THRUST
N1 RATING LIMIT CL
UPPER LIMIT OF THE N1 COMMAND
N1 COMMAND
IDLE
CLB 95.6 %
TAKE OFF GO AROUND
MAX CONTINUOUS/FLX
MAX CLIMB
TO GA
FLX MCT
CL
0
ACTUAL POSITION OF THE THRUST LEVERS
POSSIBLE OPERATING RANGE OF N1 REQUIRED BY A/THR
N1 %
6
10
91.8

INDICATIONS ON FMA

The FADECs monitor the positions of the thrust levers, and trigger appropriate indications on the FMA (*Refer to DSC-22_30-80-20 FMA Display*).

GENERAL

Ident.: DSC-70-35-10-00020792.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

A FADEC dedicated to each engine controls thrust.

The pilot uses the thrust levers to set the thrust in manual mode, and the FMGS sets the thrust in automatic mode.

The FADEC prevents the thrust from exceeding the limit for the thrust lever position in both manual and automatic modes.

The engine thrust setting is made through control of the Engine Pressure Ratio (EPR).

EPR = low pressure turbine exhaust pressure / Engine air inlet air pressure.

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GENERAL

Ident.: DSC-70-35-20-00020793.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The FADEC has two modes of power setting, EPR and N1 modes.

EPR MODE

Ident.: DSC-70-35-20-00020803.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

EPR mode is the normal mode to control the thrust.
The required EPR is set by controlling the fuel flow.

The FADEC computes the command EPR as a function of:
- Thrust Lever Angle (TLA)
- Altitude
- Mach number
- Air data (static pressure/temperature, total air pressure/temperature)
- Service bleed.

Note: *During reverse operation, the thrust is controlled as a function of N1.*

N1 MODE

Ident.: DSC-70-35-20-00020804.0005001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

In the event of no EPR available the affected FADEC will automatically revert to N1 mode.
At the reversion to N1 mode, an equivalent thrust to that achieved in EPR mode is provided, until a thrust lever position change.
In case of dispatch in N1 mode, flex take-off is not available.
Depending on the failure case leading to EPR mode loss, the FADEC will revert to either rated or degraded N1 mode.
Autothrust control disengages. However it can be re-engaged if no more than one engine is in degraded N1 mode. ALPHA FLOOR protection remains available if one engine is in degraded N1 mode.

RATED N1 MODE

An automatic reversion to rated N1 mode occurs, when:
- Engine P2 (Engine Inlet Total Pressure) and/or P5 (Engine Low Pressure Turbine Outlet Pressure) are not available, or
- Engine P2 is lower than ADIRS Pt.

The FADEC will compute an EPR COMMAND, depending on the TLA, then convert it into a N1 COMMAND as a function of Mach.
The rated N1 mode can also be manually-selected through the ENG N1 MODE pb-sw on the overhead panel.

DEGRADED N1 MODE

An automatic reversion to degraded N1 mode occurs, when:
- Engine P2 (Engine Inlet Total Pressure) and ADIRS 1 + 2 Pt are not available, or
- Engine T2 (Engine Inlet Total Temperature) and ADIRS 1 + 2 Tt are not available, or
- Engine P0 (Engine Inlet Static Pressure) and ADIRS 1 + 2 Ps are not available.

The N1 is defined as a function of TLA and altitude and is limited by the FADEC to either the smaller of N1 max or N1 redline (if T2 is available), or N1 redline (if T2 is not available).
The N1 DEGRADED MODE is an unrated N1 mode.
The N1 rating limit, N1 TLA, and N1 max indications on ECAM E/WD are lost.
In electrical emergency configuration, the EPR mode is lost on both engines, and each FADEC reverts to an degraded N1 mode.

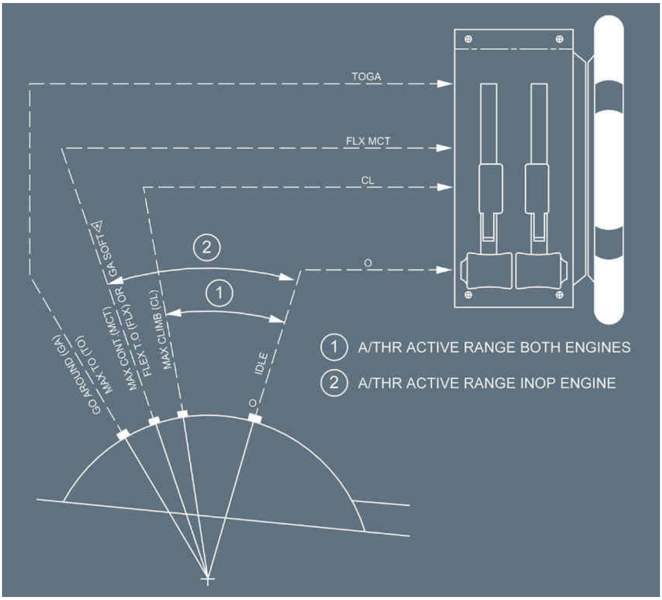
EPR RECOVERY LOGIC

Ident.: DSC-70-35-20-00004771.0002001 / 25 FEB 14
Applicable to: LV-KHT, LV-KHU

With the FADEC in either rated or degraded N1 mode, switching OFF the ENG N1 MODE pushbutton on the overhead panel will permit to return to the EPR mode, if the failure has disappeared and the aircraft is on ground.

THRUST LEVERS

Ident.: DSC-70-35-30-00020638.0001001 / 12 JUL 18
Applicable to: LV-KHT, LV-KHU


TOGA
FLX MCT
CL
O
②
①
GA SOFT
GO AROUND (GA)
MAX TO (TO)
MAX CONT (MCT) OR
FLEX T.O (FLX)
MAX CLIMB (CL)
IDLE
O
① A/THR ACTIVE RANGE BOTH ENGINES
② A/THR ACTIVE RANGE INOP ENGINE

The thrust levers can only be moved manually.
The range of movement is divided into 3 operating segments.
The sector has 4 positions defined by detents or stops.
Thrust lever position is transmitted to the FADEC which computes and displays the thrust rating limit and the EPR TLA.

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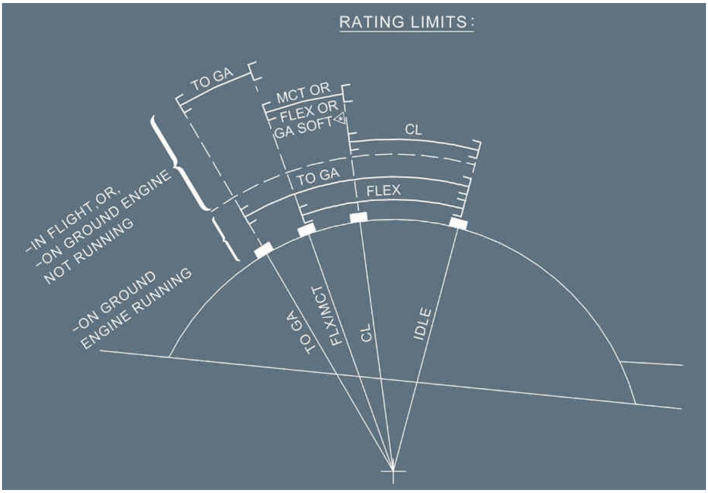
THRUST RATING LIMIT

Ident.: DSC-70-35-40-00001128.0001001 / 12 JUL 18
Applicable to: LV-KHT, LV-KHU

The FADEC computes the thrust rating limit for each thrust lever position, as shown below.
If the thrust lever is set in a detent, the FADEC selects the rating limit corresponding to this detent.
If the thrust lever is set between two detents, the FADEC will select the rating limit corresponding to the higher detent.


RATING LIMITS:
TO GA
MCT OR
FLEX OR
GA SOFT
CL
TO GA
FLEX
-IN FLIGHT, OR,
-ON GROUND ENGINE
NOT RUNNING
-ON GROUND
ENGINE RUNNING
TO GA
FLX/MCT
CL
IDLE

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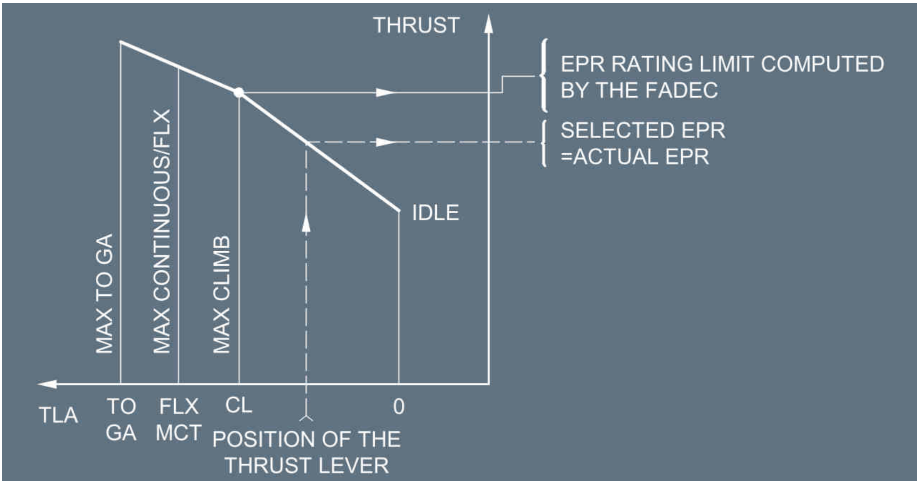
MANUAL MODE

Ident.: DSC-70-35-50-00001129.0001001 / 03 NOV 21
Applicable to: LV-KHT, LV-KHU

The engines are in the manual mode, provided the A/THR function is:
- Not armed, or
- Armed and inactive (thrust lever not in the A/THR operating range and no alpha floor).

In these conditions, each engine is controlled by its thrust lever position.
The flight crew controls thrust by moving the thrust lever from IDLE to TOGA positions. Each thrust lever position within these limits corresponds to an EPR.
When the thrust lever is in a detent, the corresponding EPR is equal to the EPR rating limit, computed by the FADEC for this engine.


THRUST
EPR RATING LIMIT COMPUTED BY THE FADEC
SELECTED EPR =ACTUAL EPR
IDLE
MAX TO GA
MAX CONTINUOUS/FLX
MAX CLIMB
TLA
TO GA
FLX MCT
CL
0
POSITION OF THE THRUST LEVER

When the thrust lever is set in FLX MCT detent :

- **On the ground :**
  The engine runs at the flex takeoff thrust rating, if the MCDU has selected a flex takeoff temperature that is higher than the current total air temperature (TAT).
  Otherwise, the engine produces maximum continuous thrust (MCT).

  Note: A FLEX TEMP change during takeoff has no effect on thrust.

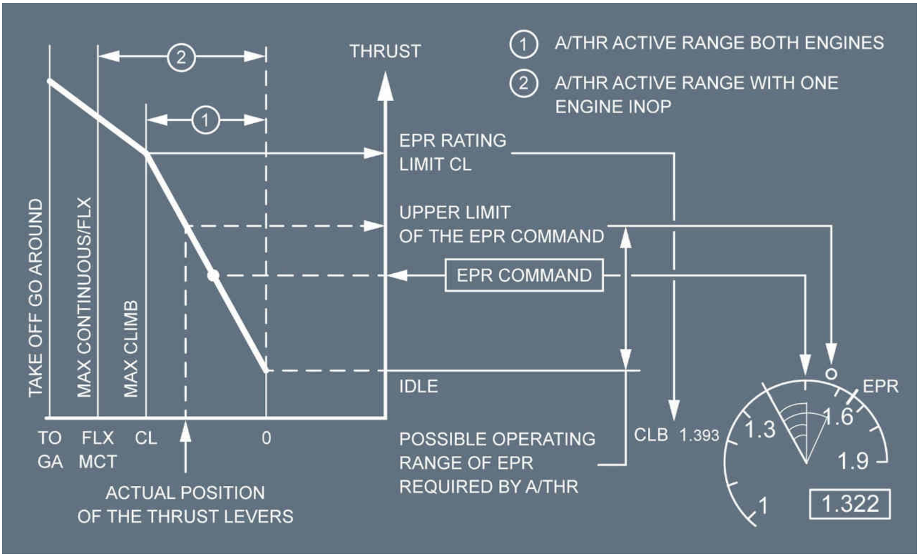
- **After takeoff :**
  The flight crew can change from FLX to MCT by moving the thrust lever to TOGA or CL, then back to MCT. After that, the flight crew cannot use the FLX rating.
  The flight crew can always get MAX TO thrust by pushing the thrust lever all the way forward.

  Note: Setting the thrust lever out of the MCT/FLX detent, without reaching TOGA or CL detent, has no effect.

AUTOMATIC MODE

Ident.: DSC-70-35-50-00020652.0001001 / 18 MAY 22
Applicable to: LV-KHT, LV-KHU

In the autothrust mode (A/THR function active), the thrust is computed by the FMGC and is limited to the value corresponding to the thrust lever position (except if the alpha-floor mode is activated).


THRUST
① A/THR ACTIVE RANGE BOTH ENGINES
② A/THR ACTIVE RANGE WITH ONE ENGINE INOP
②
①
EPR RATING LIMIT CL
UPPER LIMIT OF THE EPR COMMAND
EPR COMMAND
IDLE
TAKE OFF GO AROUND
MAX CONTINUOUS/FLX
MAX CLIMB
TO GA
FLX MCT
CL
0
ACTUAL POSITION OF THE THRUST LEVERS
POSSIBLE OPERATING RANGE OF EPR REQUIRED BY A/THR
CLB 1.393
EPR
1.3
1.6
1.9
1
1.322

INDICATIONS ON FMA

The FADECs monitor the positions of the thrust levers, and trigger appropriate indications on the FMA (*Refer to DSC-22_30-80-20 FMA Display*).

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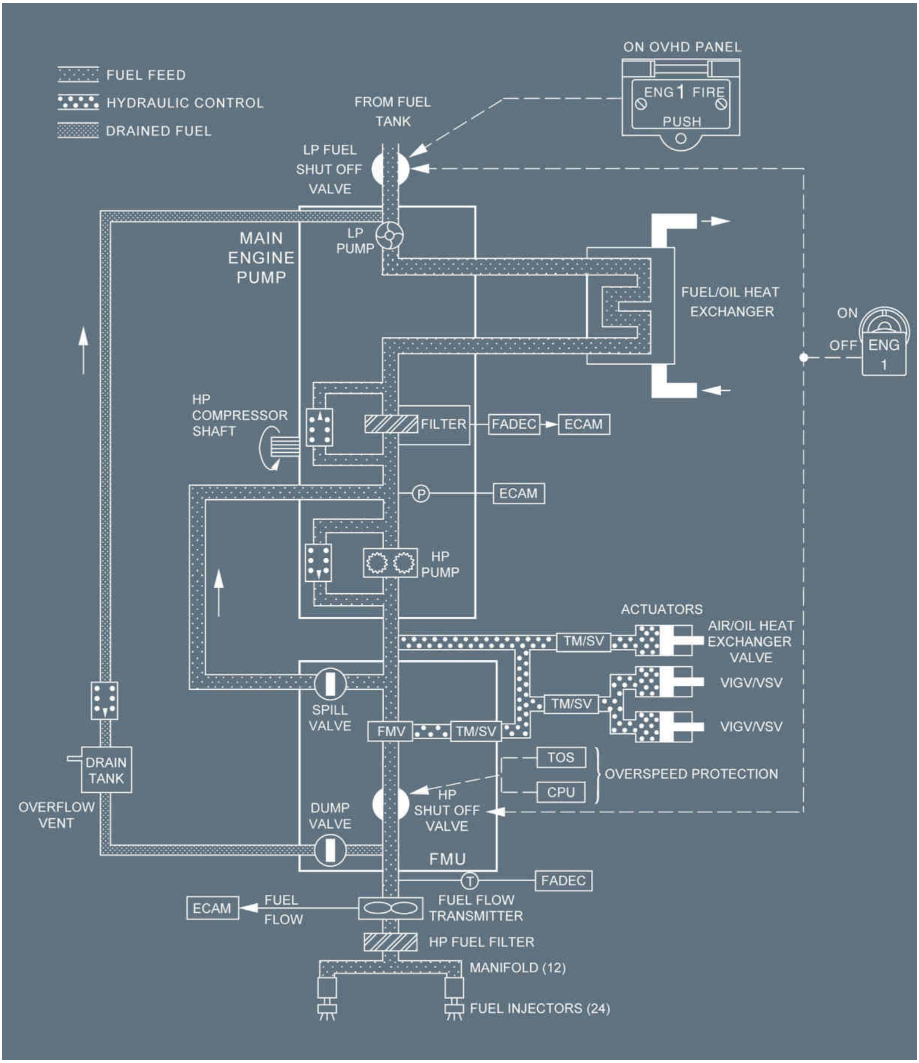
GENERAL

Ident.: DSC-70-40-10-00020631.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The fuel system supplies fuel to the combustion chamber at the required flow rate, pressure, and temperature.
The fuel flows from the tank, via the Main Engine Pump and the fuel/oil heat exchanger, to the Fuel Metering Unit (FMU) and to the fuel nozzles.
Control of fuel supply is made by the FADEC via the FMU. High pressure fuel is also used to provide pressure for some engine component actuators.

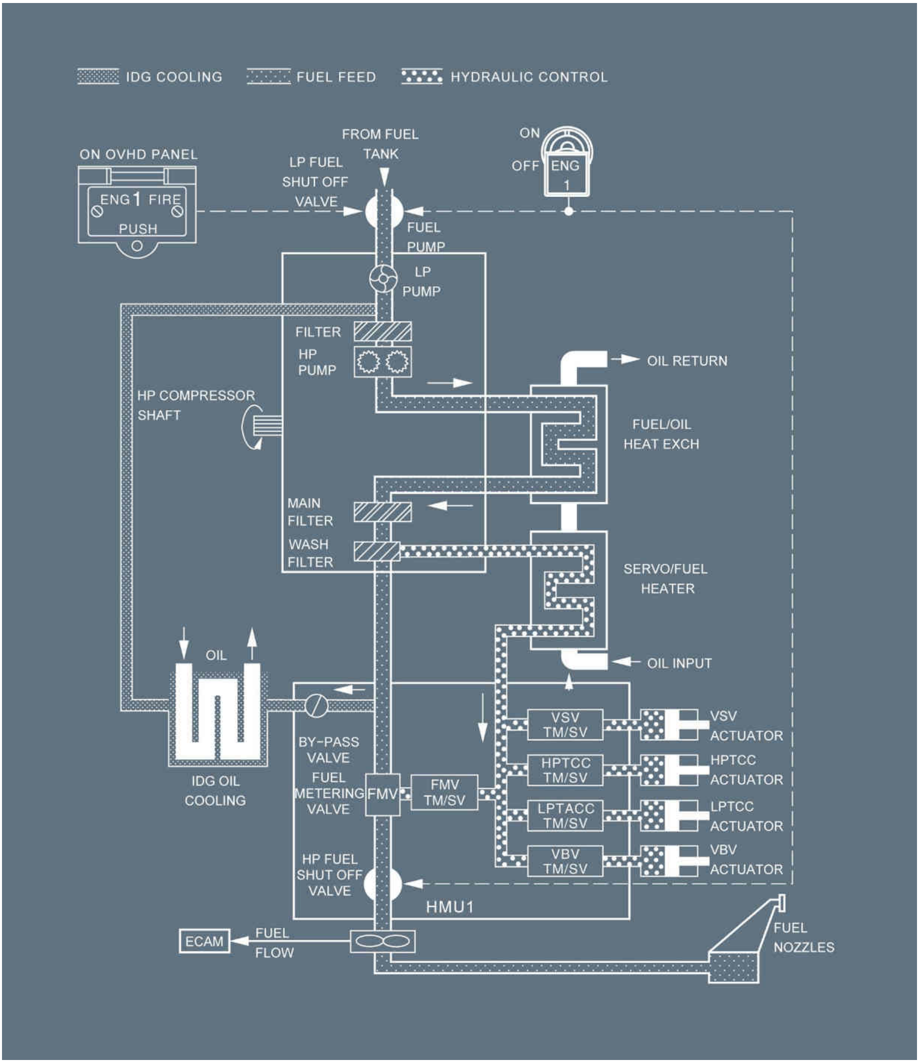
FUEL SYSTEM - GENERAL


FUEL FEED
HYDRAULIC CONTROL
DRAINED FUEL
ON OVHD PANEL
ENG 1 FIRE
PUSH
FROM FUEL TANK
LP FUEL SHUT OFF VALVE
MAIN ENGINE PUMP
LP PUMP
FUEL/OIL HEAT EXCHANGER
ON
OFF
ENG 1
HP COMPRESSOR SHAFT
FILTER
FADEC
ECAM
P
ECAM
HP PUMP
ACTUATORS
TM/SV
AIR/OIL HEAT EXCHANGER VALVE
TM/SV
VIGV/VSV
VIGV/VSV
SPILL VALVE
FMV
TM/SV
DRAIN TANK
OVERFLOW VENT
TOS
CPU
OVERSPEED PROTECTION
HP SHUT OFF VALVE
DUMP VALVE
FMU
T
FADEC
ECAM
FUEL FLOW
FUEL FLOW TRANSMITTER
HP FUEL FILTER
MANIFOLD (12)
FUEL INJECTORS (24)

GENERAL

Ident.: DSC-70-40-10-00020631.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The fuel system supplies fuel to the combustion chamber at the required flow rate, pressure, and temperature.
The fuel flows from the tank, via the fuel pump unit and the fuel/oil heat exchanger, to the Hydromechanical Unit (HMU) and to the fuel nozzles.


IDG COOLING
FUEL FEED
HYDRAULIC CONTROL
ON OVHD PANEL
ENG 1 FIRE
PUSH
FROM FUEL TANK
LP FUEL SHUT OFF VALVE
ON
OFF
ENG 1
FUEL PUMP
LP PUMP
FILTER
HP PUMP
OIL RETURN
HP COMPRESSOR SHAFT
FUEL/OIL HEAT EXCH
MAIN FILTER
WASH FILTER
SERVO/FUEL HEATER
OIL
OIL INPUT
VSV TM/SV
VSV ACTUATOR
HPTCC TM/SV
HPTCC ACTUATOR
IDG OIL COOLING
BY-PASS VALVE
FUEL METERING VALVE
FMV
FMV TM/SV
LPTACC TM/SV
LPTACC ACTUATOR
VBV TM/SV
VBV ACTUATOR
HP FUEL SHUT OFF VALVE
HMU1
FUEL NOZZLES
ECAM
FUEL FLOW

MAIN ENGINE PUMP

Ident.: DSC-70-40-20-00001136.0008001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

The HP compressor shaft drives the HP fuel pump assembly. Fuel flows through the LP pump, then through the fuel/oil heat exchanger, a filter, and the HP pump. Fuel then divides into two flows, one for the servovalve actuators, and one for the FMU’s metering valve.

FUEL PUMP UNIT

Ident.: DSC-70-40-20-00001136.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The HP compressor shaft drives the HP fuel pump assembly. Fuel flows through the LP pump, a filter (debris screen), and the HP pump (gear pump), then through the fuel/oil heat exchanger and the main filter. Fuel then divides into two filtered flows, one for the servo-fuel heater and servo-valves of the HMU, and one for the HMU's metering valve.

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SHUTOFF VALVES

Ident.: DSC-70-40-30-00020640.0005001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

Setting the ENG MASTER lever to OFF directly commands the closing of the LP and HP fuel shutoff valves for that engine's fuel system.
Upon closure of the HP fuel shutoff valve, the dump valve opens, which enables any remaining fuel from the burners to the drain tank to be purged. During engine start, fuel from the tank is returned to the LP fuel pump.

SHUTOFF VALVES

Ident.: DSC-70-40-30-00020640.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Setting the ENG MASTER lever to OFF directly commands the closing of the LP and HP fuel shutoff valves for that engine's fuel system.

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GENERAL

Ident.: DSC-70-40-40-00020641.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The FMU is controlled by the FADEC, and performs :
- Control of the fuel flow to the engine combustion chamber through the Fuel Metering Valve (FMV)
- Overspeed protection by closing the HP shutoff valve
- Actuation of the HP shutoff valve to start, or stop, the engine.

GENERAL

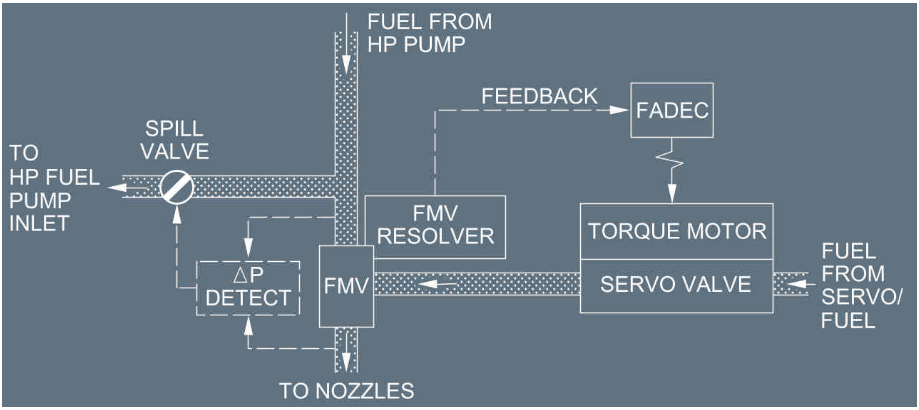
Ident.: DSC-70-40-40-00020641.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The HMU is controlled by the FADEC, and performs :
- Control of the fuel flow to the engine combustion chamber through the Fuel Metering Valve (FMV)
- Overspeed protection for N2 by opening the fuel bypass valve
- Control of the fuel hydraulic signals to actuators.

FUEL FLOW

Ident.: DSC-70-40-40-00001139.0003001 / 09 FEB 18
Applicable to: LV-KHT, LV-KHU

L3 The Fuel Metering Valve (FMV) transforms FADEC orders through a torque motor and servovalve into fuel flow to the engine fuel nozzles.
The FMV resolver generates a feedback signal proportional to the FMV position.
The bypass valve maintains a constant pressure drop across the FMV to ensure that the metered fuel flow is proportional to the FMV position.

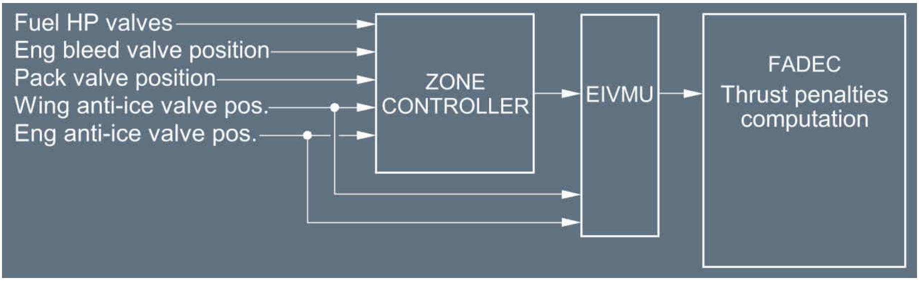

FUEL FROM HP PUMP
FEEDBACK
FADEC
SPILL VALVE
TO HP FUEL PUMP INLET
FMV RESOLVER
TORQUE MOTOR
ΔP DETECT
FMV
SERVO VALVE
FUEL FROM SERVO/ FUEL
TO NOZZLES

L1 The FADEC computes the fuel flow that will maintain the target EPR.

As the FADEC maintains this EPR, it allows N3 to vary while remaining between N3 minimum and N3 maximum. The FADEC also controls the engine parameters to :

- Limit acceleration and deceleration ;
- Avoid engine stall or flameout ;
- Limit max EPR, N1, N2 and N3 ;
- Maintain the air bleed pressure requirement.

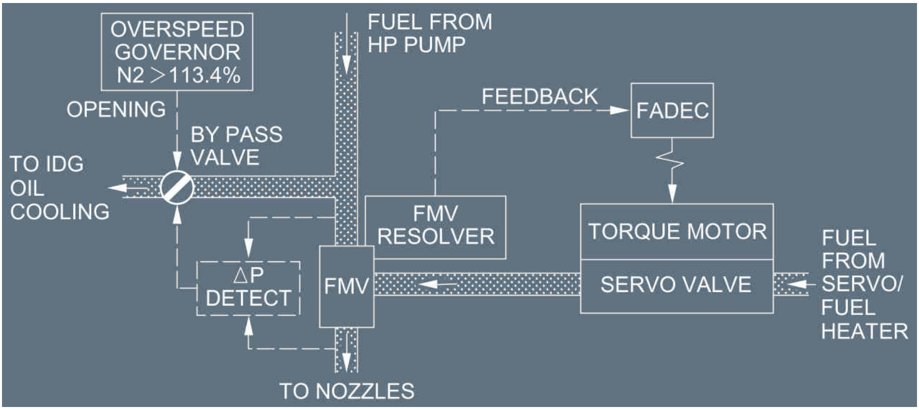
The FADEC computes N3 correction, according to the bleed configuration.


Fuel HP valves
Eng bleed valve position
Pack valve position
Wing anti-ice valve pos.
Eng anti-ice valve pos.
ZONE CONTROLLER
EIVMU
FADEC Thrust penalties computation

FUEL FLOW

Ident.: DSC-70-40-40-00001139.0004001 / 09 FEB 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

L3 The Fuel Metering Valve (FMV) transforms FADEC orders through a torque motor and servovalve into fuel flow to the engine fuel nozzles.
The FMV resolver generates a feedback signal proportional to the FMV position.
The bypass valve maintains a constant pressure drop across the FMV to ensure that the metered fuel flow is proportional to the FMV position.

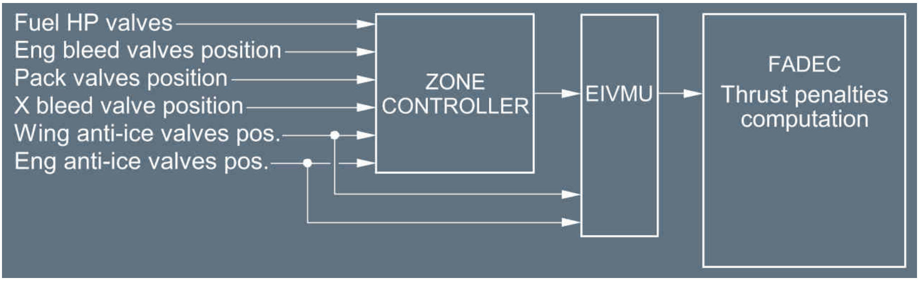

OVERSPEED
GOVERNOR
N2 >113.4%
OPENING
BY PASS
VALVE
TO IDG
OIL
COOLING
FUEL FROM
HP PUMP
FEEDBACK
FADEC
FMV
RESOLVER
TORQUE MOTOR
SERVO VALVE
ΔP
DETECT
FMV
FUEL
FROM
SERVO/
FUEL
HEATER
TO NOZZLES

L1 The FADEC computes the fuel flow that will maintain the target N1.

As the FADEC maintains this N1, it allows N2 to vary while remaining between N2 minimum and N2 maximum. The FADEC also controls the engine parameters to :

- Limit acceleration and deceleration ;
- Avoid engine stall or flameout ;
- Limit max N1 and N2 ;
- Maintain the air bleed pressure requirement.

The FADEC computes the N2 correction according to the bleed configuration.


Fuel HP valves
Eng bleed valves position
Pack valves position
X bleed valve position
Wing anti-ice valves pos.
Eng anti-ice valves pos.
ZONE
CONTROLLER
EIVMU
FADEC
Thrust penalties
computation

OVERSPEED PROTECTION

Ident.: DSC-70-40-40-00020651.0003001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

TURBINE OVERSPEED PROTECTION (TOS)

The FADEC provides protection against LP turbine overspeed, due to LP shaft breakage between compressor and turbine. If it occurs, the engine is shut down by closing the HP shut-off valve.

OVERSPEED PROTECTION UNIT (OPU)

Independent of the FADEC, the engine is fitted with the N1/N2 overspeed protection unit. In the event of overspeed condition detected by the OPU, which occurs when N1 reaches 110 % or N2 reaches 117 % , the OPU controls the engine shutdown by closing the HP shut-off valve.

OVERSPEED PROTECTION

Ident.: DSC-70-40-40-00020651.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Independent of the FADEC, the overspeed governor limits the N2 by opening the fuel bypass valve, in the event of a malfunction that could lead to an overspeed condition.

IDLE CONTROL

Ident.: DSC-70-40-40-00001144.0001001 / 21 MAR 16
Applicable to: ALL

The FADEC has the following three idle modes :

Modulated idle

- Is regulated according to :
  - Bleed system demand
  - Oil temperature
  - Mach number.
- Is selected :
  - In flight, when the flaps are retracted and the gear is up.
  - On ground, provided reverse is not selected.

Approach idle

- Is regulated according to aircraft altitude, regardless of bleed system demand.
- Selected in flight, when the FLAPS are extended to FLAP 2, FLAP 3, or FULL, or when the landing gear is down.
- Allows the engine to rapidly accelerate from idle to go-around thrust.

Reverse idle

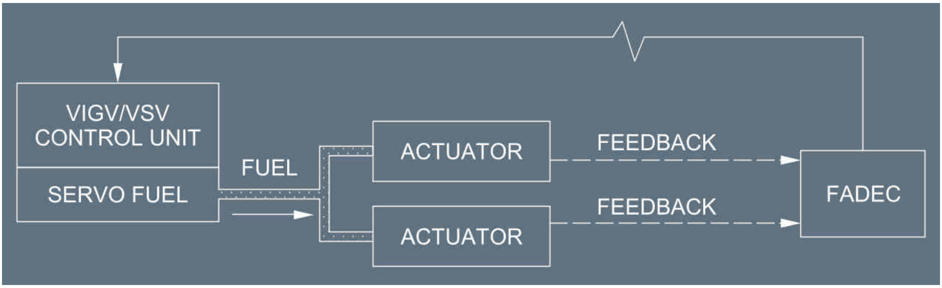
- Selected on ground, when reverse idle thrust is selected.
- Slightly higher than forward idle thrust.

FUEL HYDRAULIC SIGNALS

Ident.: DSC-70-40-40-00001145.0005001 / 09 OCT 12
Applicable to: LV-KHT, LV-KHU

L3 Fuel hydraulic signals are sent to :

- **Air/Oil heat Exchanger Control Valve**
- **Variable Stator Vanes (VSVs) and Variable Inlet Guide Vanes (VIGVs)**
  The FADEC controls the VSV/VIGV system which positions the compressor variable vanes to provide optimum intermediate pressure and high pressure compressor efficiency to prevent surge during transient engine operations.
  VSVs/VIGVs are fully closed at low engine power, and are fully open at high power.
  VIGVs are controlled closed, if the FADEC detects an intermediate pressure or low pressure turbine overspeed.



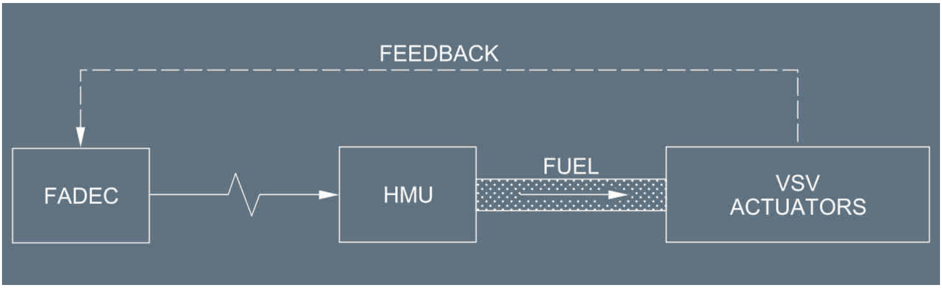
FUEL HYDRAULIC SIGNALS

Ident.: DSC-70-40-40-00001145.0002001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

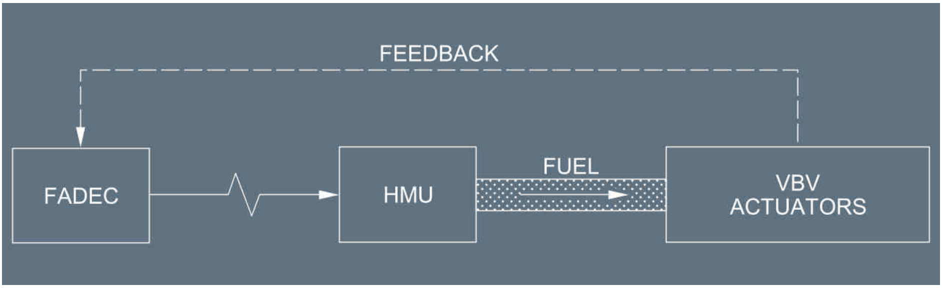
L3 Fuel hydraulic signals go to :

- **Low Pressure Turbine Clearance Control (LPTCC) valves.**
  Refer to DSC-70-60 Cooling
- **High Pressure Turbine Clearance Control (HPTCC) valves.**
  Refer to DSC-70-60 Cooling

- **Variable Stator Vanes (VSV s)**
  The VSVs system positions the compressor variable vanes.
  The FADEC maintains optimum compressor efficiency at a steady state and an adequate stall margin for transient engine operation.
  VSVs are fully closed at low engine power, and are fully open at high thrust.



- **Variable Bleed Valves (VBV s)**
  The FADEC controls the VBVs, upstream of the HP compressor. Their setting depends on compressor inlet temperature and on N2. It varies between full open (start, low thrust, and during fast deceleration) and full closed (high thrust) positions.



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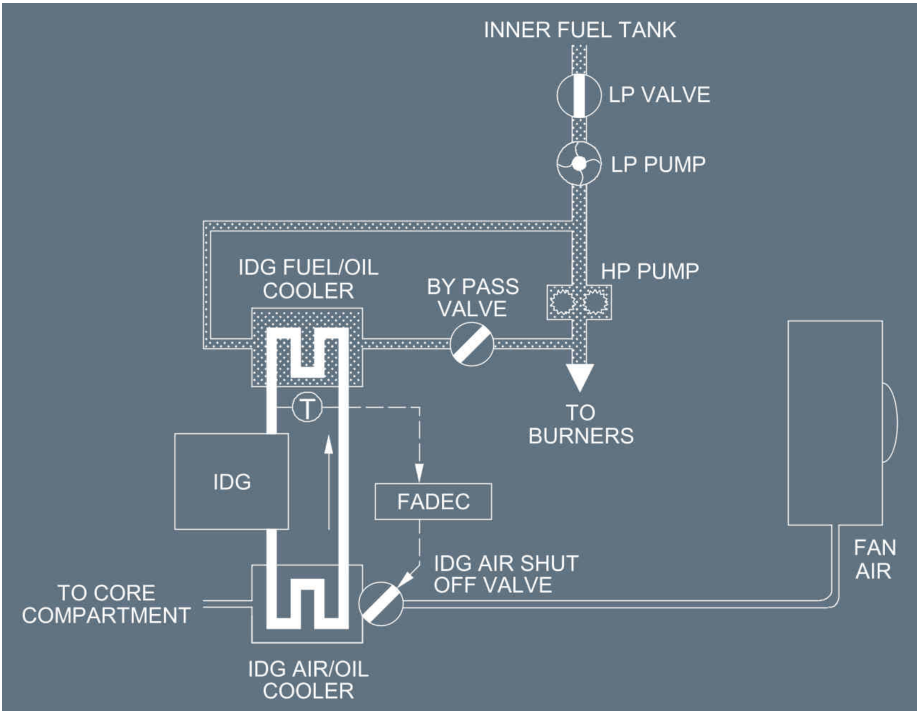
GENERAL

Ident.: DSC-70-40-50-00001146.0002001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

IDG oil cooling is ensured by the IDG fuel/oil heat exchanger using fuel flow from the HMU.
At low fuel flows the IDG oil is cooled with fan discharge air thru an air/oil cooler.
The air is extracted from the fan by opening the air/oil cooler valve controlled by the FADEC.


INNER FUEL TANK
LP VALVE
LP PUMP
IDG FUEL/OIL COOLER
BY PASS VALVE
HP PUMP
TO BURNERS
T
IDG
FADEC
IDG AIR SHUT OFF VALVE
FAN AIR
TO CORE COMPARTMENT
IDG AIR/OIL COOLER

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GENERAL

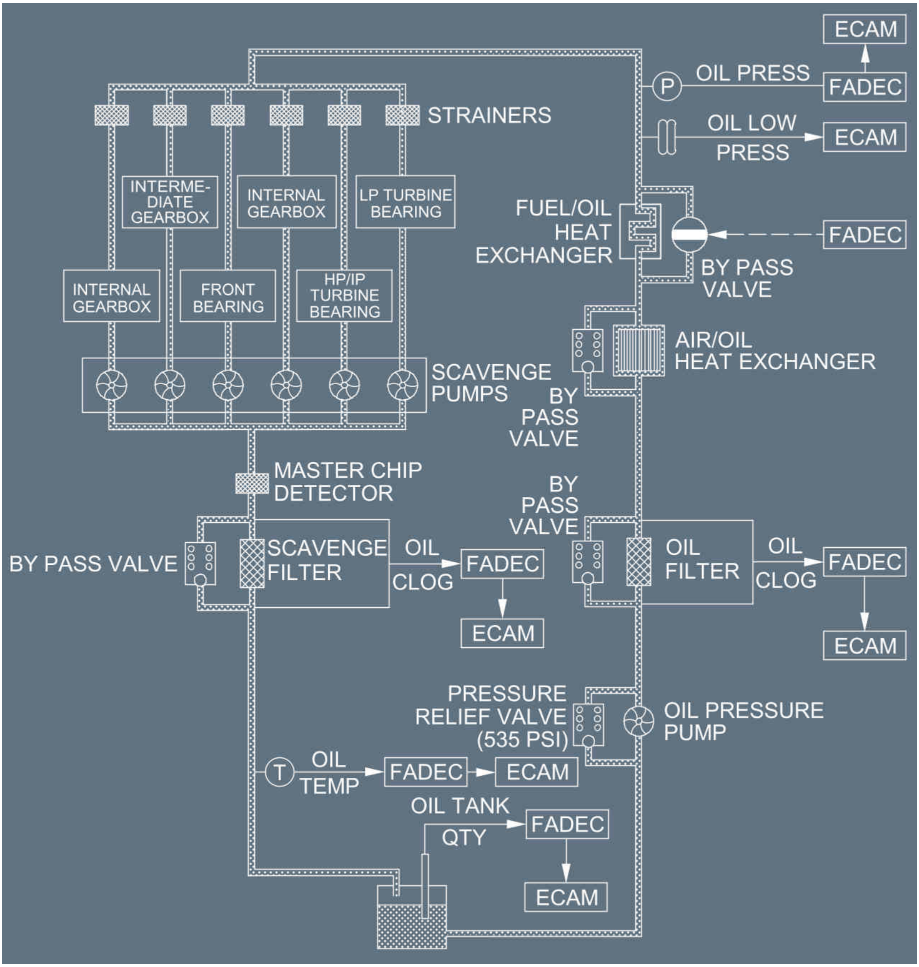
Ident.: DSC-70-50-10-00020653.0001001 / 17 MAR 17
Applicable to: ALL

The oil system lubricates the engine components.

It contains the :
- Oil tank
- Lube and scavenge pump modules
- Fuel/oil and/or air/oil heat exchanger
- Filters, pressure relief and bypass valves.

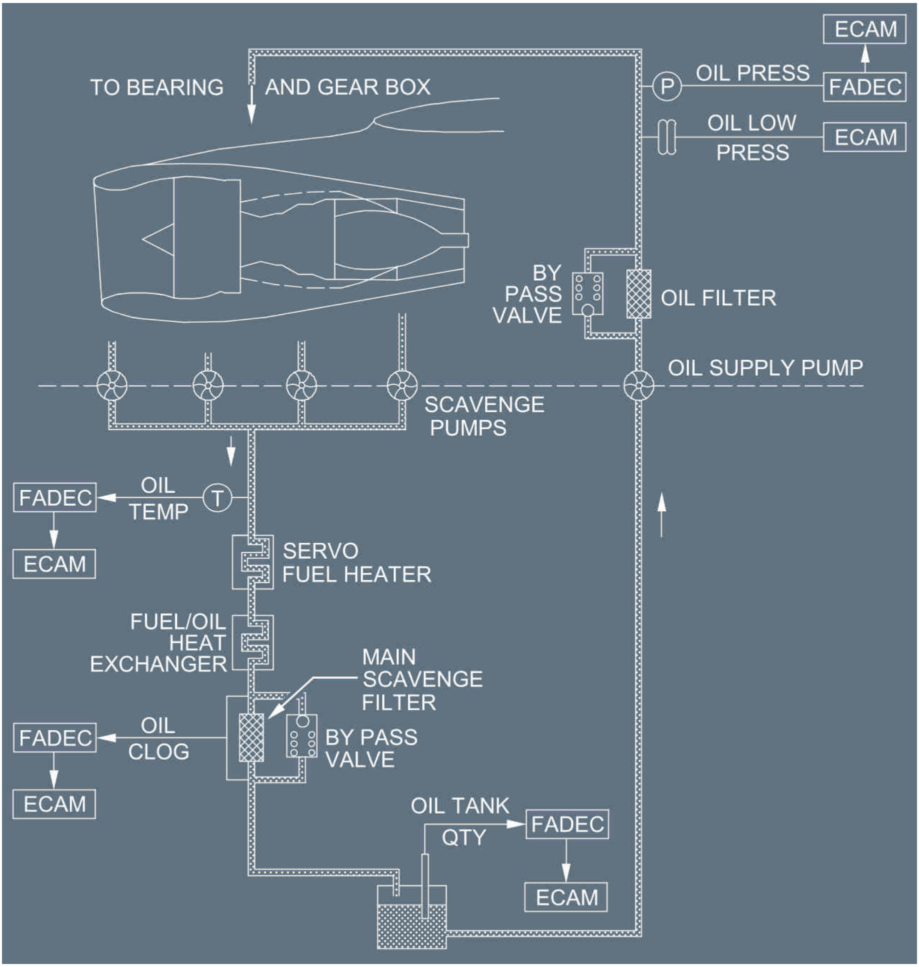
Ident.: DSC-70-50-10-00020654.0004001 / 17 MAR 17

Applicable to: LV-KHT, LV-KHU


ECAM
OIL PRESS
P
FADEC
STRAINERS
OIL LOW
PRESS
ECAM
INTERME-
DIATE
GEARBOX
INTERNAL
GEARBOX
LP TURBINE
BEARING
FUEL/OIL
HEAT
EXCHANGER
FADEC
BY PASS
VALVE
INTERNAL
GEARBOX
FRONT
BEARING
HP/IP
TURBINE
BEARING
AIR/OIL
HEAT EXCHANGER
SCAVENGE
PUMPS
BY
PASS
VALVE
MASTER CHIP
DETECTOR
BY
PASS
VALVE
BY PASS VALVE
SCAVENGE
FILTER
OIL
CLOG
FADEC
ECAM
OIL
FILTER
OIL
CLOG
FADEC
ECAM
PRESSURE
RELIEF VALVE
(535 PSI)
OIL PRESSURE
PUMP
T
OIL
TEMP
FADEC
ECAM
OIL TANK
QTY
FADEC
ECAM

Ident.: DSC-70-50-10-00020654.0002001 / 17 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


TO BEARING
AND GEAR BOX
ECAM
OIL PRESS
P
FADEC
OIL LOW
PRESS
ECAM
BY
PASS
VALVE
OIL FILTER
OIL SUPPLY PUMP
SCAVENGE
PUMPS
FADEC
OIL
TEMP
T
ECAM
SERVO
FUEL HEATER
FUEL/OIL
HEAT
EXCHANGER
MAIN
SCAVENGE
FILTER
FADEC
OIL
CLOG
BY PASS
VALVE
ECAM
OIL TANK
QTY
FADEC
ECAM

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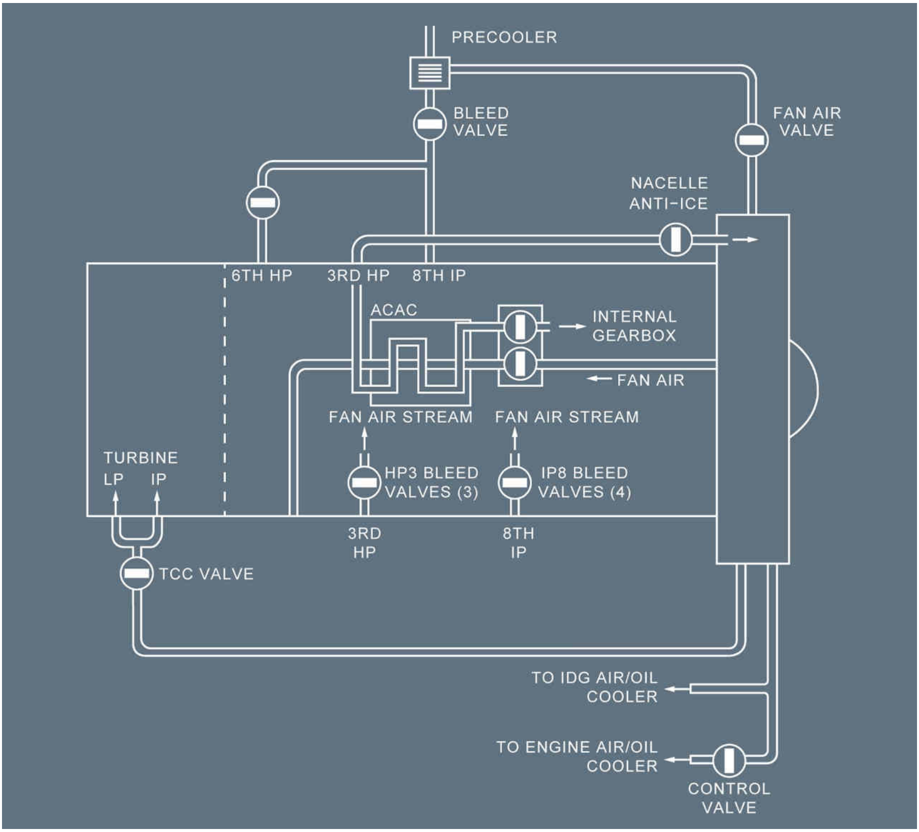
GENERAL

Ident.: DSC-70-60-00020664.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

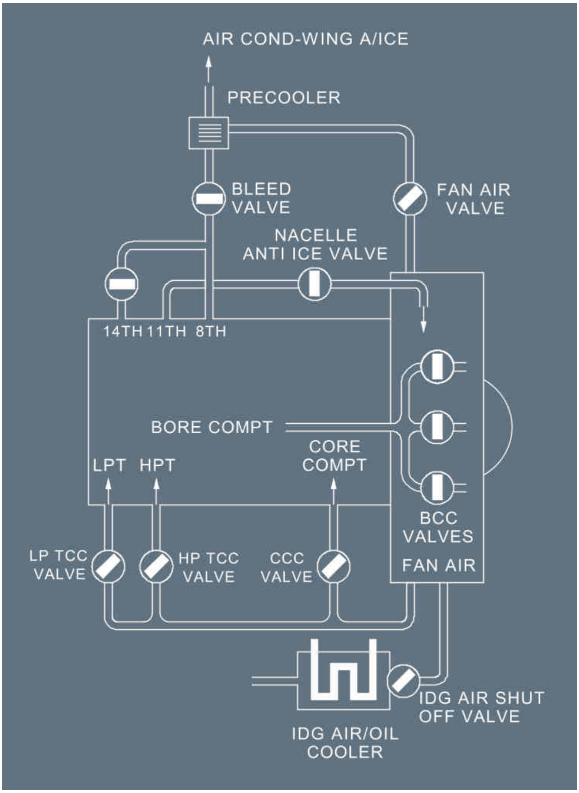
The air bleed system is used for :
- The pneumatic system (*Refer to DSC-36-10-10 General*).
- Cooling the engine compartment and the turbine.
- Cooling the engine and IDG oil
- Engine stability.


PRECOOLER
BLEED VALVE
FAN AIR VALVE
NACELLE ANTI-ICE
6TH HP
3RD HP
8TH IP
ACAC
INTERNAL GEARBOX
FAN AIR
FAN AIR STREAM
FAN AIR STREAM
TURBINE
LP
IP
HP3 BLEED VALVES (3)
IP8 BLEED VALVES (4)
3RD HP
8TH IP
TCC VALVE
TO IDG AIR/OIL COOLER
TO ENGINE AIR/OIL COOLER
CONTROL VALVE

GENERAL

Ident.: DSC-70-60-00020664.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The air bleed system is used for :
- The pneumatic system (*Refer to DSC-36-10-10 General*).
- Cooling the engine compartment and the turbine.
- Cooling the IDG oil.


AIR COND-WING A/ICE
PRECOOLER
BLEED VALVE
FAN AIR VALVE
NACELLE ANTI ICE VALVE
14TH 11TH 8TH
BORE COMPT
CORE COMPT
LPT HPT
BCC VALVES
FAN AIR
LP TCC VALVE
HP TCC VALVE
CCC VALVE
IDG AIR SHUT OFF VALVE
IDG AIR/OIL COOLER

COOLING

Ident.: DSC-70-60-00001153.0007001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

HP TURBINE CLEARANCE CONTROL (HPTCC) SYSTEM

The HPTCC system is controlled by the FADEC, through the HMU, and controls the high pressure turbine clearance. The FADEC modulates the fan air flow for the high pressure turbine case cooling.
It provides optimization of high pressure turbine performance and EGT reduction.

LP TURBINE CLEARANCE CONTROL (LPTCC) SYSTEM

The LPTCC system is controlled by the FADEC, through the HMU, and controls low pressure turbine clearance.
The FADEC modulates the fan bleed air flow for the low pressure turbine case cooling.

CORE COMPARTMENT COOLING (CCC) SYSTEM

The CCC system is controlled by the FADEC. The core compartment is cooled and ventilated by fan air thru the CCC valve pneumatically actuated.
The FADEC controls the valve to a low flow position during cruise at normal cruise power settings.

BORE COMPARTMENT COOLING (BCC) SYSTEM

The BCC system is controlled by the FADEC. The bore compartment is cooled and ventilated by fan air thru the three BCC solenoid valves.
FADEC reduces the cooling during cruise.

COOLING

Ident.: DSC-70-60-00001153.0004001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

TURBINE CASE COOLING (TCC)

The TCC system is controlled by the FADEC to improve engine performance by controlling the intermediate pressure turbine blade tip clearance, and cooling intermediate pressure and low pressure turbine cases.
The TCC valve is controlled by the FADEC to modulate air flow depending on flight conditions.
The valve is fully open in cruise for optimal engine performance.

INTERNAL GEARBOX COOLING

The internal gearbox cooling system is controlled by the FADEC to regulate air pressure and temperature within the engine center bearing. The HP 3 air to gearbox is cooled in the Air Cooled

Air Cooler (ACAC) using fan air and modulated by a dual valve controlled by the FADEC. The valve is fully open during hot day take-off and climb conditions.

IDG COOLING

Fan air is used to cool the IDG oil through the air/oil cooler. A bypass valve opens when oil is too cold and cannot flow easily through the cooler.

ENGINE STABILITY

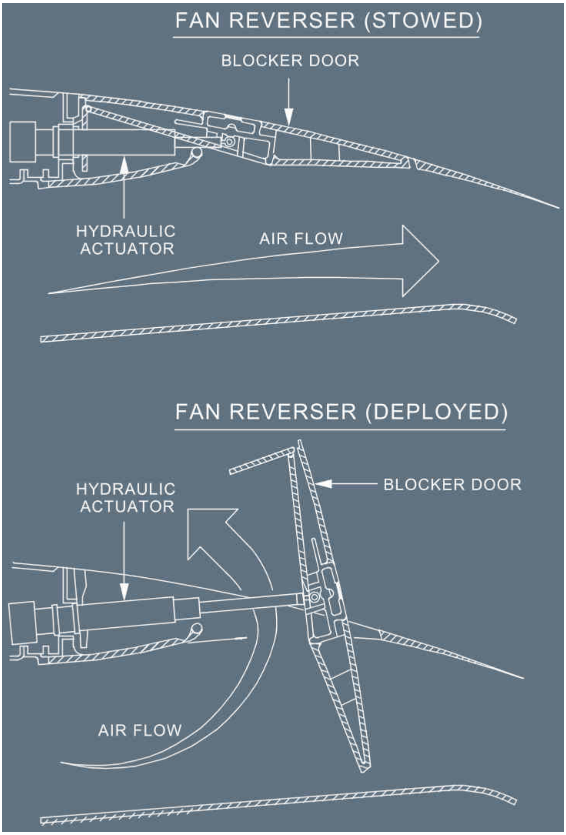
Ident.: DSC-70-60-00001154.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

Two air bleed systems provide greater compressor stability in different flight phases. The volume of airflow through the intermediate pressure and low pressure compressors is regulated by four intermediate pressure stage 8, and three high pressure stage 3, bleed valves controlled by the FADEC. At low engine speed, the bleed valves are open to prevent engine stall.

GENERAL

Ident.: DSC-70-70-00020761.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The aircraft performs engine reverse thrust via four pivoting blocker doors on each engine to create a deflected fan airstream.


FAN REVERSER (STOWED)
BLOCKER DOOR
HYDRAULIC ACTUATOR
AIR FLOW
FAN REVERSER (DEPLOYED)
HYDRAULIC ACTUATOR
BLOCKER DOOR
AIR FLOW

A hydraulic door jack positions each door.
- The blue circuit powers the doors on engine 1
- The yellow circuit powers the doors on engine 2.

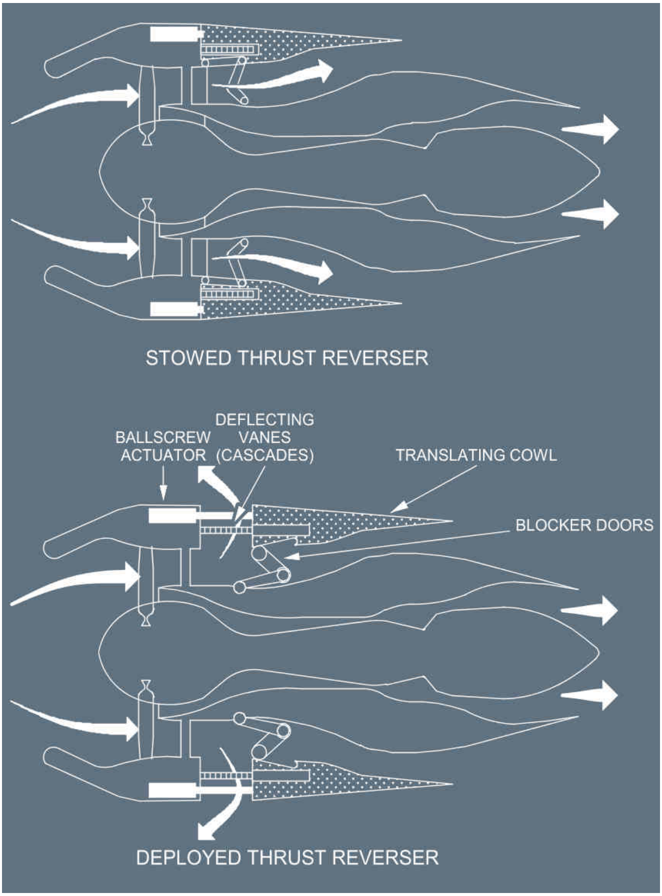
The thrust reverser system is independently controlled for each engine by the associated FADEC. This system is controlled and monitored by each FADEC channel. The translating cowls are hydraulically actuated. The thrust reverser system for each engine includes all of the following:

- Four pivoting blocker doors each activated by an hydraulic actuator
- A hydraulic isolation valve controlled by the FADEC
- A directional control valve, which directs hydraulic pressure to 4 hydraulic locks and to the deploy or stow line
- Four independent electrical locks controlled by the FADEC
- Four stow proximity switches and four lock proximity switches to monitor if the translating cowls are deployed or stowed and locked
- Four tertiary locks (one for each of the pivoting doors) that enable the reverse to be maintained in the locked position via a door pin. During engine reverse thrust, a solenoid enables the door pin to be released.

GENERAL

Ident.: DSC-70-70-00020761.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Reverse thrust is obtained by deflecting the fan airstream. This is done when the translating cowls are fully-deployed backward. This action therefore enables the pivoting blocker doors to divert the fan flow forward through the cascades.


STOWED THRUST REVERSER
BALLSCREW ACTUATOR
DEFLECTING VANES (CASCADES)
TRANSLATING COWL
BLOCKER DOORS
DEPLOYED THRUST REVERSER

The thrust reverser system is independently controlled for each engine by the associated FADEC. This system is controlled and monitored by each FADEC channel. The translating cowls are pneumatically actuated. The thrust reverser system for each engine includes all of the following:

- Two translating cowls, each activated by three ballscrews operated by a single pneumatic motor actuator
- An air supply valve that automatically selects one of the air pneumatic source depending on delivered pressure
- A pressure regulator and shutoff valve to regulate downstream pressure to 90 PSI maximum
- A directional control valve that actuates the pneumatic motor in the deployed/stowed position

- Two stow switches (one per cowl) and two deploy switches (one per cowl) to monitor if the translating cowls are deployed or stowed
- One thrust reverser brake that is spring loaded in the lock position. During engine reverse thrust operation, a solenoid enables the spring to be unloaded.

ACTUATION LOGIC

Ident.: DSC-70-70-00020764.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

Deployment requires :
- TLA reverse signals from FADEC and from the flight control primary computer (PRIM 1 or PRIM 3)
- One FADEC channel that operates with its associated throttle reverse signal
- Aircraft on ground signal from at least one LGCIU.

During deployment, engine reverse thrust is limited to idle, until the reversers are deployed by more than 70 %. Then, FADEC will command full reverse thrust to be available when reversers position are more than 90 % deployed.

ACTUATION LOGIC

Ident.: DSC-70-70-00020764.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Deployment requires :
- One FADEC channel that operates with its associated throttle reverse signal
- Aircraft on ground signal from at least one LGCIU
- TLA reverse signal from the flight control primary computer 1 or 3 (PRIM 1 or PRIM 3).

Before the transit completion of the blocker doors, the FADEC sets reverse idle thrust.

PROTECTION

Ident.: DSC-70-70-00020765.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

AUTO RESTOW FUNCTION AND IDLE PROTECTION

The FADEC will automatically command the engine to idle and the reverser to stow if at least one door is unstowed by more than 5 % and reverse thrust is not selected while engine is running. The affected reverser will remain pressurized after affected door is locked back.
If the door is still detected unstowed, the engine will remain at idle for the remainder of the flight.

PROTECTION

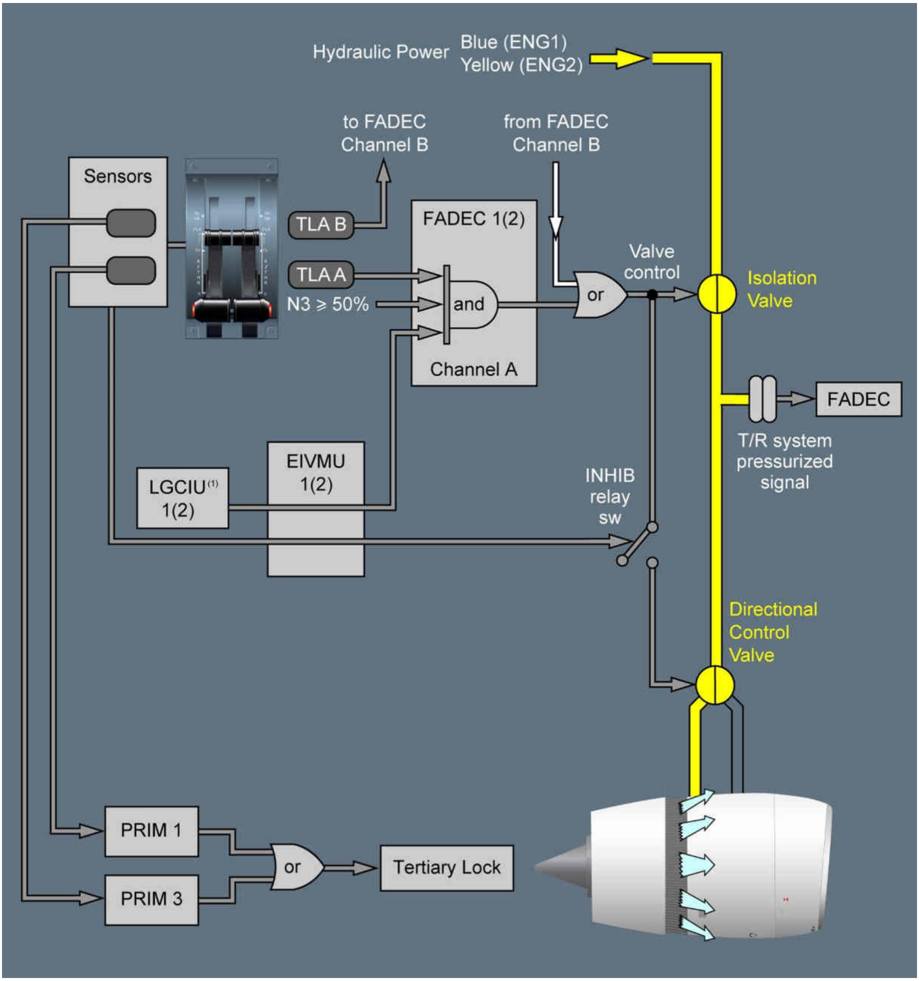
Ident.: DSC-70-70-00020765.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

AUTO RESTOW FUNCTION AND IDLE PROTECTION

The FADEC will automatically command the reverser to stow if at least one door is unstowed and reverse thrust is not selected while engine is running.
The FADEC will automatically select idle thrust if the reverse thrust is not selected and one translating cowl is unstowed by more than 30 % or both cowls are unstowed by more than 15 %.

SCHEMATIC

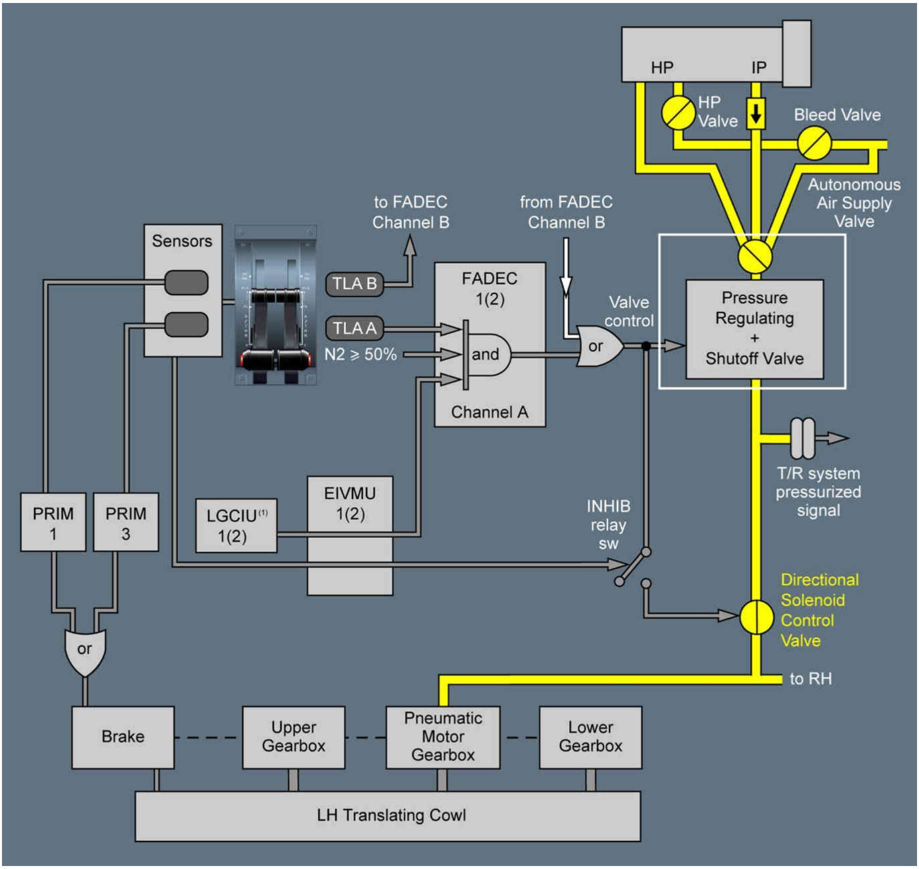
Ident.: DSC-70-70-00020663.0003001 / 14 NOV 22
Applicable to: LV-KHT, LV-KHU


Hydraulic Power
Blue (ENG1)
Yellow (ENG2)
to FADEC
Channel B
from FADEC
Channel B
Sensors
TLA B
TLA A
N3 ≥ 50%
FADEC 1(2)
and
Channel A
or
Valve
control
Isolation
Valve
FADEC
T/R system
pressurized
signal
EIVMU
1(2)
LGCIU(1)
1(2)
INHIB
relay
sw
Directional
Control
Valve
PRIM 1
PRIM 3
or
Tertiary Lock

(1) LGCIU 1 is preferred if valid.

SCHEMATIC

Ident.: DSC-70-70-00020663.0001001 / 14 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


HP
IP
HP Valve
Bleed Valve
Autonomous Air Supply Valve
to FADEC Channel B
from FADEC Channel B
Sensors
TLA B
TLA A
N2 ≥ 50%
FADEC 1(2)
and
Channel A
Valve control
or
Pressure Regulating + Shutoff Valve
T/R system pressurized signal
PRIM 1
PRIM 3
LGCIU(1) 1(2)
EIVMU 1(2)
INHIB relay sw
Directional Solenoid Control Valve
to RH
or
Brake
Upper Gearbox
Pneumatic Motor Gearbox
Lower Gearbox
LH Translating Cowl

(1) LGCIU 1 is preferred if valid.

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GENERAL

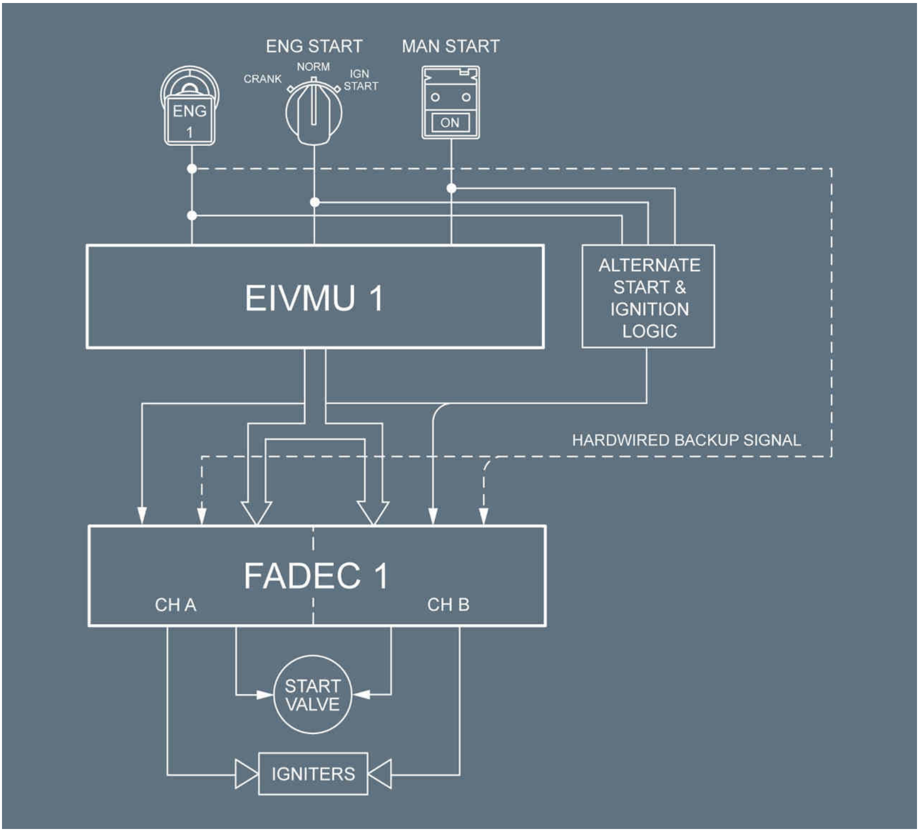
Ident.: DSC-70-80-10-00020602.0001001 / 28 MAY 20
Applicable to: ALL

The FADEC controls and monitors the ignition and starting system, according to the:
- ENG START selector position
- ENG MASTER lever position
- ENG MAN START pushbutton position
- Flight/ground aircraft condition.

In normal operation, the FADEC receives its inputs from the EIVMU/EIU.
In the event of an EIVMU/EIU signal loss, all the functions, except manual start and wet crank, will remain available by using both a backup signal from the ENG MASTER lever, and the alternate start/ignition signal.

ARCHITECTURE

Ident.: DSC-70-80-10-00020603.0001001 / 17 MAR 17
Applicable to: ALL

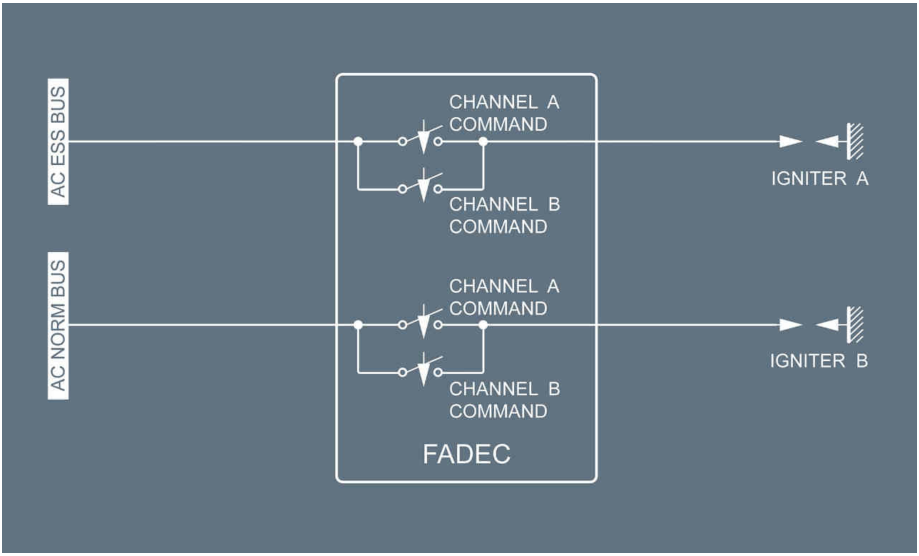

ENG START
MAN START
CRANK
NORM
IGN START
ENG 1
ON
EIVMU 1
ALTERNATE START & IGNITION LOGIC
HARDWIRED BACKUP SIGNAL
FADEC 1
CH A
CH B
START VALVE
IGNITERS

GENERAL

Ident.: DSC-70-80-20-00020604.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The ignition system ensures:
- Engine start on ground (automatic and manual engine starts)
- Engine relight in flight
- Flameout prevention.

It consists of two identical independent circuits for each engine, normally controlled by the FADEC's channel A, with channel B on standby. Each FADEC channel can control both igniters.

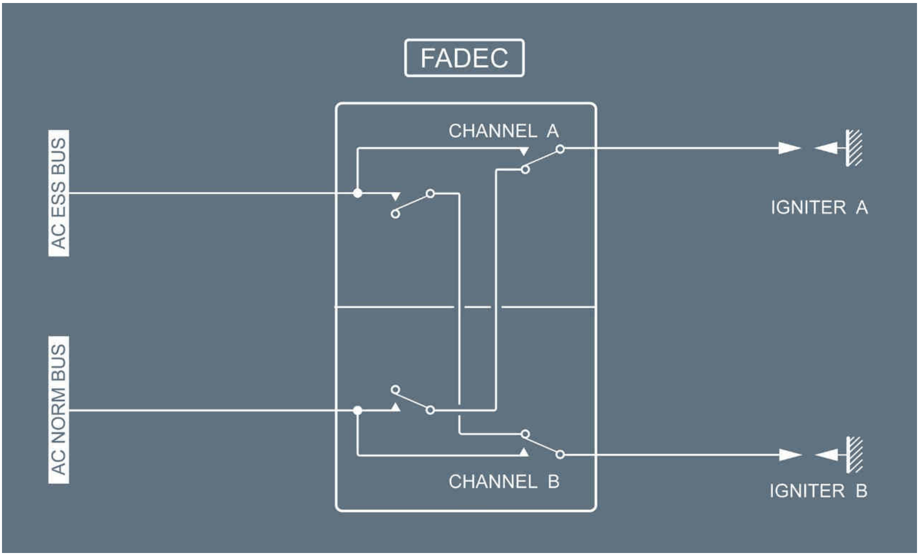

AC ESS BUS
CHANNEL A COMMAND
CHANNEL B COMMAND
IGNITER A
AC NORM BUS
CHANNEL A COMMAND
CHANNEL B COMMAND
IGNITER B
FADEC

GENERAL

Ident.: DSC-70-80-20-00020604.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

The ignition system ensures:
- Engine start on ground (automatic and manual engine starts)
- Engine relight in flight
- Flameout prevention.

It consists of two identical independent circuits for each engine, normally controlled by the FADEC's channel A, with channel B on standby. Each FADEC channel can control both igniters.



IGNITION FOR STARTING

Ident.: DSC-70-80-20-00020605.0002001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ON GROUND

During a first automatic start attempt only one igniter is supplied. The FADEC automatically alternates the igniters and/or channels used in successive start sequences.
The ignition comes on automatically when N2 reaches 10 %.
The ignition is automatically cut off when N2 reaches 54 %.
If the automatic start fails the FADEC energizes both igniters at the same time during the second attempt at an engine start.
During a manual start both igniters are supplied, when the ENG MASTER lever is ON. Both igniters cut off when N2 reaches 54 %.

IN FLIGHT

In case of start attempt in flight, when the ENG MASTER lever is ON, both igniters are supplied.

IGNITION FOR STARTING

Ident.: DSC-70-80-20-00020605.0006001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU

ON GROUND

During a first automatic start attempt only one igniter is supplied. The FADEC automatically alternates the igniters used in successive start sequences.
When residual EGT is above 100 °C, the engine is cranked until the EGT goes below 100 °C.

Note: 1. *In the case of a second automatic start attempt after the failure of one igniter to light up, both igniters are supplied when the EGT goes below 150 °C.*
2. *In the case of an automatic restart attempt after an automatic start abort, the start sequence starts again from the beginning, and therefore only one igniter is supplied.*

During a manual start both igniters are supplied, when the ENG MASTER lever is ON.

IN FLIGHT

In case of start attempt in flight, when the ENG MASTER lever is ON, both igniters are supplied.

CONTINUOUS IGNITION

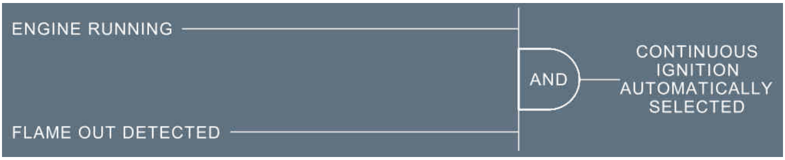
Ident.: DSC-70-80-20-00020606.0004001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Continuous ignition is either selected manually or automatically to protect engine combustion.

MANUAL SELECTION

In flight, continuous ignition is selected, when the ENG START selector is on IGN/START, provided the assigned engine is running.
On ground, after starting, since ignition is automatically cut off, to select continuous ignition, turn the ENG START selector to NORM, then back to IGN/START.

AUTOMATIC SELECTION



CONTINUOUS IGNITION

Ident.: DSC-70-80-20-00020606.0003001 / 09 FEB 18
Applicable to: LV-KHT, LV-KHU

Continuous ignition is either selected manually or automatically to protect engine combustion.

MANUAL SELECTION

In flight, continuous ignition is selected, when the ENG START selector is on IGN/START, provided the assigned engine is running.
Only one igniter is selected. If failed, both igniters are automatically selected.
On ground, after starting, since ignition is automatically cut off, to select continuous ignition, turn the ENG START selector to NORM, then back to IGN/START.

AUTOMATIC SELECTION

Continuous ignition (igniters A + B) is automatically selected:

- If engine anti-ice is selected on and relevant EIU/EIVMU is inoperative
- For 10 s, in the event of engine flame out condition detected by FADEC on ground or in flight (auto relight function)
- For 10 s in the event of inadvertent cycling of the Master lever with the engine running provided N3 is above 50 %.

WINDMILLING QUICK RELIGHT FUNCTION

Ident.: DSC-70-80-20-00020721.0003001 / 04 SEP 18
Applicable to: ALL

In case of inadvertent engine shutdown by cycling the Engine Master lever to OFF then ON, the FADEC will attempt automatically a relight regardless of the rotary selector position.

GENERAL

Ident.: DSC-70-80-30-00001175.0001001 / 21 MAR 16
Applicable to: ALL

The engine starting system consists of an air turbine starter and a start valve.
The start valve admits air supplied by the pneumatic system to operate the starter.
The FADEC electrically controls the start valve. On ground, in the event of an electrical control failure, the start valve can be manually operated by a handle.

AUTOMATIC STARTING

Ident.: DSC-70-80-30-00020722.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

This sequence is under the FADEC's full authority, which controls the:
- Start valve
- Igniter(s)
- Fuel HP valves.

It provides:
- Detection of hot start, hung start, stall or no light up, and protection for starter reengagement speed and time
- FAULT announcement with specific ECAM message
- Start abort on ground (high pressure valve closure, start valve closure, and ignition stopped), and automatic engine crank after start abort and control of any additional start attempts.

In flight, the FADEC identifies the windmilling or starter-assisted airstart conditions, according to engine parameters and the flight conditions.
This sequence may be interrupted by selection of the engine master lever to OFF.

AUTOMATIC STARTING

Ident.: DSC-70-80-30-00020722.0004001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

This sequence is under the FADEC's full authority, which controls the:
- Start valve
- Igniter(s)
- Fuel HP valves.

It provides:

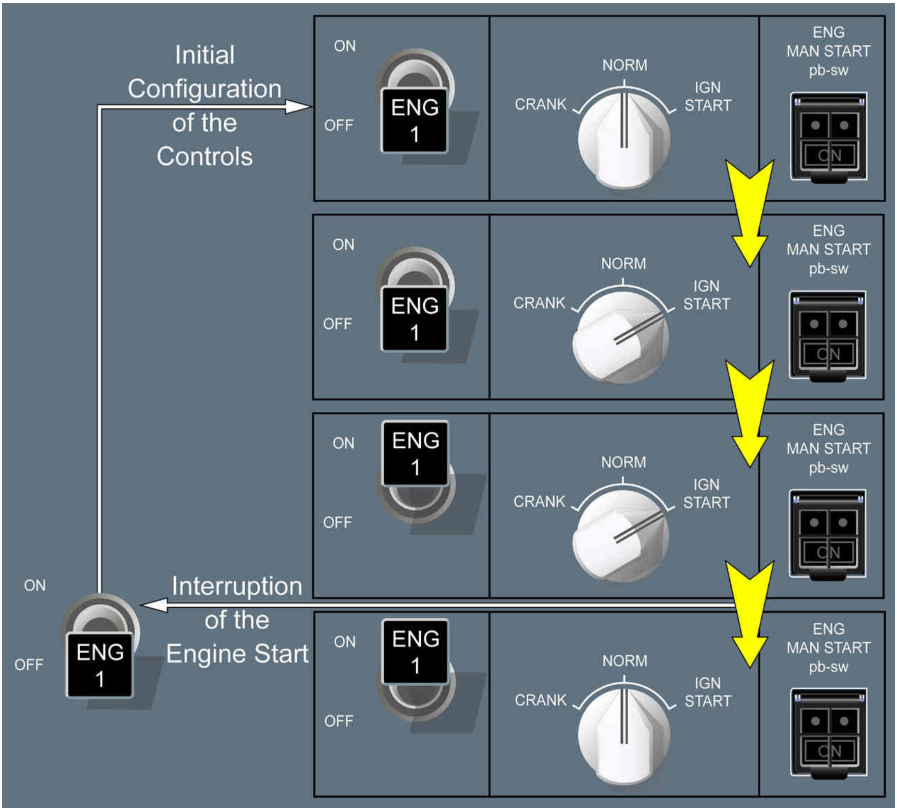
- Detection of hot start, hung start, surge, no light up or N1 rotor locked
- FAULT announcement with specific ECAM message
- Start abort on ground (high pressure valve closure, start valve closure, ignition stopped) and automatic engine dry crank after start abort
  One further automatic start attempt will be initiated by the FADEC after cranking, except in the case of N1 rotor locked. If this start attempt fails, the start will be aborted.

In flight, the FADEC identifies the windmilling or starter-assisted airstart conditions, according to engine parameters and the flight conditions.
This sequence may be interrupted by selection of the engine master lever to OFF.
Automatic start abort is inhibited on ground, when N3 is above 50 % or in flight.

AUTOMATIC STARTING SEQUENCE

Ident.: DSC-70-80-30-A-00020622.0001001 / 21 MAR 17
Applicable to: ALL

SEQUENCE OF THE AUTOMATIC START


Initial Configuration of the Controls
ON
OFF
ENG 1
CRANK
NORM
IGN START
ENG MAN START pb-sw
ON
Interruption of the Engine Start

Ident.: DSC-70-80-30-A-00020623.0001001 / 10 MAY 21
Applicable to: ALL

INITIAL CONFIGURATION OF THE CONTROLS

The initial configuration prior to an automatic engine start is the following:
- The ENG MASTER lever is set to OFF
- The ENG START selector is set to NORM
- The ENG MAN START pb-sw is set to OFF.

Ident.: DSC-70-80-30-A-00020624.0001001 / 28 MAY 20
Applicable to: ALL

FIRST STEP

The flight crew must set the ENG START selector to IGN/START, leading to the following:
- The ENG SD page appears on the SD
- All engine parameters are available
- All pack valves automatically close.

After 30 s, if the flight crew does not set the ENG MASTER lever to ON (*Refer to DSC-70-80-30 Second Step*), the pack valves automatically open again and in case of first engine start the ENG SD page will automatically disappear.

Ident.: DSC-70-80-30-A-00020625.0004001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

SECOND STEP

The flight crew must set the ENG MASTER lever to ON, and the following steps occur:
- The LP fuel valve opens
- The engine start valve opens (except in flight in the stabilized windmill zone)
- The ignition starts:
  - On ground: when N3 is between 25 and 30 %
  - In flight: Immediately.
- The HP fuel valve opens
- When N3 ≥ 50 %, the engine start valve closes (the valve is fully closed in 10 s)
- The ignition stops.

Ident.: DSC-70-80-30-A-00020625.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

SECOND STEP

The flight crew must set the ENG MASTER lever to ON, and the following steps occur:
- The LP fuel valve opens
- The engine start valve opens

- When N2 ≥ 10 %, the ignition starts
- When N2 ≥ 15 %, the HP fuel valve opens
- When N2 ≥ 50 %, the engine start valve closes
- When N2 ≥ 54 %, the ignition stops.

Ident.: DSC-70-80-30-A-00020626.0001001 / 21 MAR 17
Applicable to: ALL

THIRD STEP

The automatic engine start is finished.
The flight crew must set the ENG START selector to NORM.
On ground the WHEEL SD page replaces the ENG SD page.
In flight the CRUISE SD page replaces the ENG SD page.
If ENG START selector is not switched to NORM, the ENG page is automatically replaced by the WHEEL or CRUISE SD page 15 s after all engines are running.

Ident.: DSC-70-80-30-A-00020627.0001001 / 21 MAR 17
Applicable to: ALL

INTERRUPTION OF THE AUTOMATIC START

When required by ECAM and after confirmation, the flight crew must set the ENG MASTER lever to OFF.

If the flight crew sets the ENG MASTER lever to OFF, the FADEC automatically:
- Closes the LP and the HP fuel shutoff valves
- Stops to energize the ignitor
- Closes the engine start valve.

MANUAL STARTING

Ident.: DSC-70-80-30-00020738.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

If an automatic start is not successful, the flight crew can perform a manual start.
In the manual start sequence, the FADEC has limited control. As a result, the flight crew must monitor engine acceleration.

To perform a manual start, the flight crew must:
- Set the ENG START selector to IGN/START
- Set the ENG MAN START pb-sw to ON
- Set the ENG MASTER lever to ON.

The FADEC:

- Opens the engine start valve when the flight crew:
  - Sets the ENG START selector to IGN/START
  - Sets the ENG MAN START pb-sw to ON
- Opens the HP shutoff valve, and operates both igniters when the flight crew sets the ENG MASTER lever to ON
- Closes the engine start valve, and cuts off the ignition when N2 reaches 54 %.

For more information about the manual start sequence, *Refer to PRO-NOR-SUP-ENG Manual Engine Start - General*.
The FADEC provides a passive survey of the engine during the starting sequence.
On ground, it will automatically abort the starting sequence in the case of starter reengagement speed exceedance.
In flight, the FADEC always commands a starter assisted airstart.

MANUAL STARTING

Ident.: DSC-70-80-30-00020738.0004001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

If an automatic start is not successful, the flight crew can perform a manual start.
In the manual start sequence, the FADEC has limited control. As a result, the flight crew must monitor engine acceleration.

To perform a manual start, the flight crew must:

- Set the ENG START selector to IGN/START
- Set the ENG MAN START pb-sw to ON
- Set the ENG MASTER lever to ON.

The FADEC:

- Opens the engine start valve when the flight crew:
  - Sets the ENG START selector to IGN/START
  - Sets the ENG MAN START pb-sw to ON
- Opens the HP shutoff valve, and operates both igniters when the flight crew sets the ENG MASTER lever to ON
- Closes the engine start valve, and cuts off the ignition when N3 reaches 50 %.

For more information about the manual start sequence, *Refer to PRO-NOR-SUP-ENG Manual Engine Start - General*.
The FADEC provides a passive survey of the engine during the starting sequence.

In flight, the FADEC always commands a starter assisted airstart unless the N3 is above the start valve closure value (50 % N3).

ENGINE VENTILATION (DRY CRANKING)

Ident.: DSC-70-80-30-00020737.0002001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

A dry cranking cycle enables the engine to be ventilated to remove fuel vapors after an unsuccessful start attempt on the ground.
Cranking can be manually selected by setting the ENG START selector to CRANK and the MAN START pb to ON (ENG MASTER lever OFF). It is stopped by setting the MAN START pb to OFF.

CAUTION	Selecting the ENG START selector to NORM would not stop the cranking.

ENGINE VENTILATION (DRY CRANKING)

Ident.: DSC-70-80-30-00020737.0003001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

A dry cranking cycle enables the engine to be ventilated to remove fuel vapors after an unsuccessful start attempt on ground.
Cranking can be manually selected by setting the ENG START selector to CRANK and the ENG MAN START pb-sw to ON (ENG MASTER lever to OFF). It is stopped by setting the ENG MAN START pb-sw to OFF or selecting the ENG START selector to NORM.
A manual start sequence can be initiated immediately following a dry crank sequence by selecting the ENG START selector to IGN/START and ENG MASTER lever to ON.

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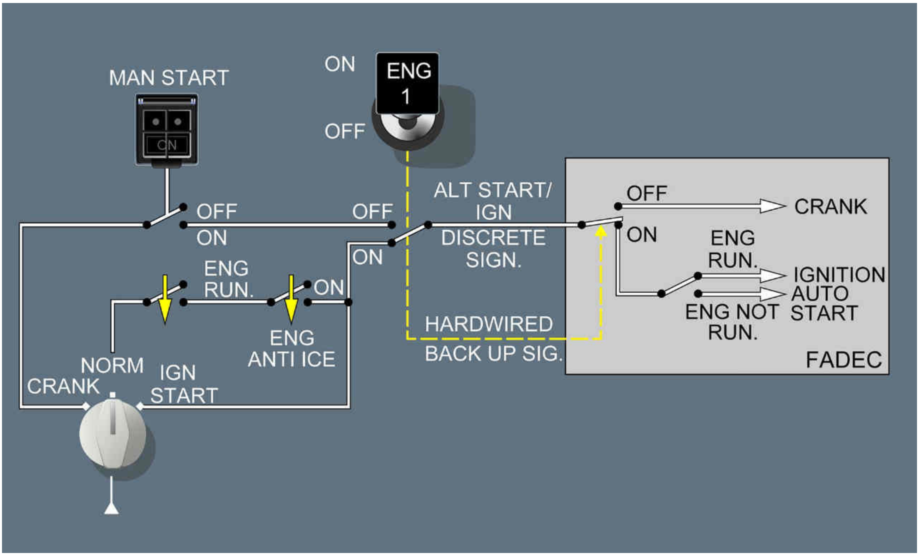
ALTERNATE START/IGNITION INFORMATION

Ident.: DSC-70-80-40-00020630.0001001 / 10 MAY 21
Applicable to: ALL

In the case of EIVMU/EIU failure, the FADEC uses a backup signal from the ENG MASTER lever and the alternate start/ignition signal to control:

- An automatic start, or
- A dry crank, or
- Continuous ignition.

Manual starting is no longer available.


MAN START
ON
ON
ENG 1
OFF
OFF
ON
OFF
ON
ENG RUN.
ON
ENG ANTI ICE
ALT START/ IGN DISCRETE SIGN.
HARDWIRED BACK UP SIG.
OFF
CRANK
ON
ENG RUN.
IGNITION
AUTO START
ENG NOT RUN.
FADEC
NORM
CRANK
IGN START

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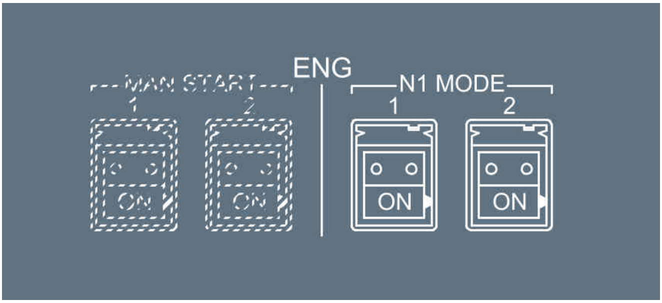
ENG N1 MODE PANEL

Applicable to: LV-KHT, LV-KHU

Ident.: DSC-70-90-10-25-00019015.0003001 / 21 MAR 16

ENG N1 MODE Panel


ENG
MAN START
1
2
N1 MODE
1
2
ON
ON
ON
ON

Ident.: DSC-70-90-10-25-00019016.0001001 / 21 MAR 16

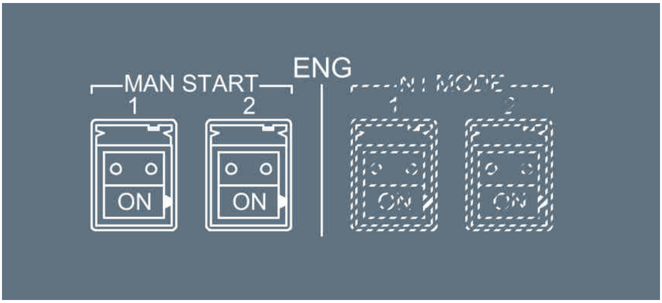
ENG N1 MODE pb-sw

Off	:	The FADEC controls the engine in EPR mode, if available.
ON	:	The FADEC controls the engine in N1 mode.

ENG MAN START PANEL

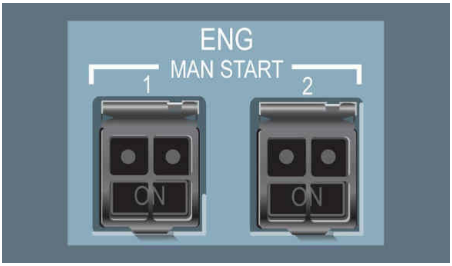
Ident.: DSC-70-90-10-20-00019013.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

ENG MAN START Panel


ENG
MAN START
1
2
N1 MODE
1
2
ON
ON
ON
ON

Ident.: DSC-70-90-10-20-00019013.0001001 / 12 JUL 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ENG MAN START Panel



Ident.: DSC-70-90-10-20-00019014.0001001 / 21 MAR 16
Applicable to: ALL

ENG MAN START pb-sw

L12

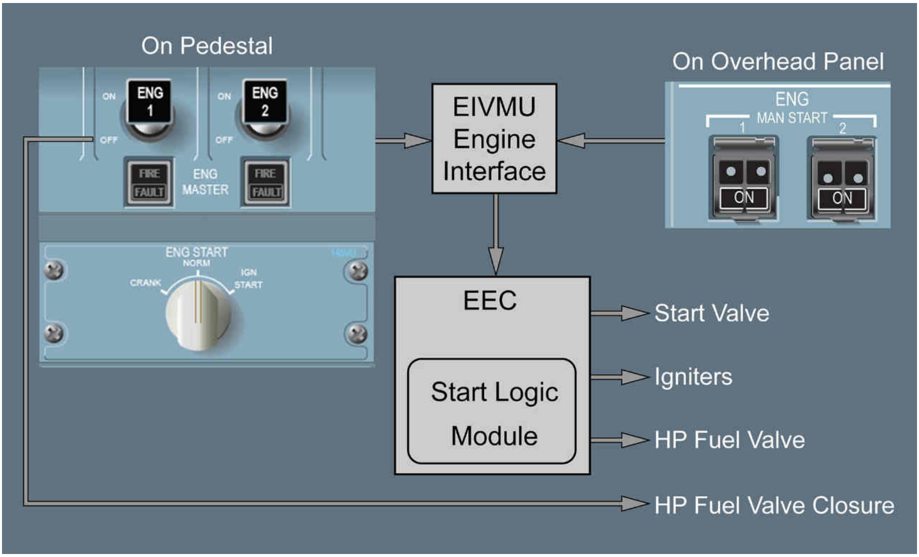
ON	- Initiates the manual start sequence of the associated engine, when the ENG START selector is set to IGN/START, or - Initiates the wet crank process of the associated engine, when the ENG START selector is set to CRANK and the ENG MASTER lever is set to ON, or - Initiates the dry crank process of the associated engine, when the ENG START selector is set to CRANK and the ENG MASTER lever is set to OFF.
Off	- Aborts the manual start sequence of the associated engine, when the ENG START selector is set to IGN/START and the ENG MASTER lever is set to OFF, or - Stops the dry crank process of the associated engine, when the ENG START selector is set to CRANK and the ENG MASTER lever is set to OFF.

ENG START SELECTOR AND ENG MASTER LEVERS

Applicable to: ALL

Ident.: DSC-70-90-20-30-00019017.0001001 / 04 JUL 17

ENG START Selector and ENG MASTER Levers


On Pedestal
ON
ENG 1
OFF
ON
ENG 2
OFF
FIRE
FAULT
ENG MASTER
FIRE
FAULT
ENG START
NORM
CRANK
IGN START
On Overhead Panel
ENG
MAN START
1
2
ON
ON
EIVMU Engine Interface
EEC
Start Logic Module
Start Valve
Igniters
HP Fuel Valve
HP Fuel Valve Closure

Ident.: DSC-70-90-20-30-00019018.0001001 / 09 NOV 17

ENG START SELECTOR

NORM : Normal mode of operation.

IGN/START : Use the IGN/START position to:

- Initiate the automatic or manual start sequences of the associated engine, when the ENG MASTER lever is set to OFF, or
- Initiate the ignitors in flight as required.

L13

CRANK : Use the CRANK position to:

- Initiate the dry crank process of the associated engine, when the ENG MASTER lever is set to OFF and the ENG MAN START pb-sw is set to ON.
- Initiate the wet crank process of the associated engine for maintenance purposes, when the ENG MASTER lever, and the ENG MAN START pb-sw are set to ON.

Ident.: DSC-70-90-20-30-00019019.0001001 / 28 MAY 20

ENG MASTER LEVER

L13

The FADEC:

- Provides the associated engine with continuous ignition, when both engines are running and the ENG START selector is set to IGN/START, or
- Initiates the wet crank process of the associated engine for maintenance purpose, when the ENG START selector is set to CRANK and the ENG MAN START pb-sw is set to ON, or
- Initiates the automatic start sequence of the associated engine, when the ENG START selector is set to IGN/START, or
- Initiates the manual start sequence of the associated engine, when the ENG START selector is set to IGN/START and the ENG MAN START pb-sw is set to ON.

The FADEC:

- Shuts down the associated engine, or
- Aborts the start sequence of the associated engine.

Ident.: DSC-70-90-20-30-00019020.0001001 / 21 MAR 16

ENG MASTER LIGHT

FIRE light : A fire is detected in the corresponding engine.

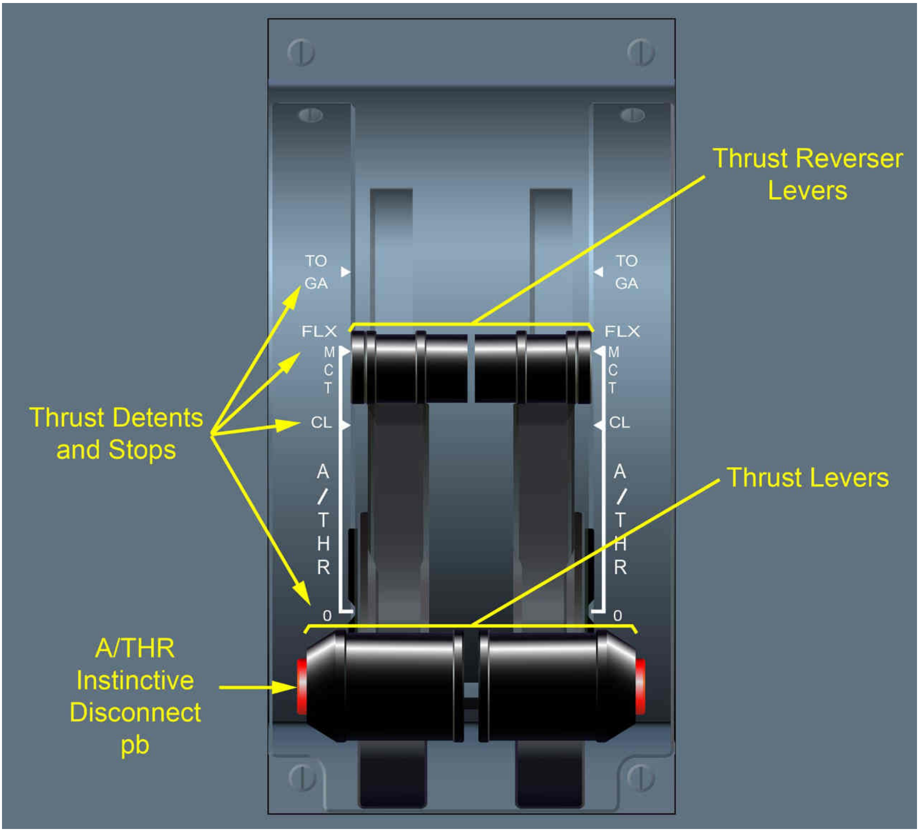
FAULT light :
- The position of the HP fuel shutoff valve is abnormal, or
- The automatic start sequence of the associated engine aborts, or
- There is a malfunction of the thrust control.

THRUST LEVERS

Applicable to: ALL

Ident.: DSC-70-90-20-40-00019021.0001001 / 21 MAR 16

Thrust Levers


Thrust Reverser Levers
TO
GA
FLX
M
C
T
CL
A/THR
0
Thrust Detents and Stops
Thrust Levers
A/THR Instinctive Disconnect pb

Ident.: DSC-70-90-20-40-00019022.0001001 / 21 MAR 16

THRUST LEVERS

The flight crew uses the thrust levers in order to:
- Adjust the thrust, or
- Select a thrust stop or detent.

The flight crew can move each thrust lever individually.

L2 The position of the thrust levers appears on the E/WD, via a blue circle on the thrust gauge.

L1 The flight crew can move each thrust lever forward the Idle (0) stop, when the associated thrust reverser lever is set to the stowed detent.

Ident.: DSC-70-90-20-40-00019023.0001001 / 21 MAR 16

THRUST DETENTS AND STOPS

There are one stop and three detents, for the thrust levers:
- The Idle (0) stop
- The Climb (CL) detent
- The Maximum Continuous Thrust (MCT)/Flexible Take Off (FLX) detent
- The Takeoff (TO)/Go-Around (GA) detent.

There are two stops and one detent, for the thrust reverser levers:
- The stowed stop
- The idle reverser (IDLE REV) detent
- The maximum reverser (MAX REV) stop.

Ident.: DSC-70-90-20-40-00019024.0001001 / 21 MAR 16

THRUST REVERSER LEVERS

The flight crew uses the thrust reverser levers in order to:
- Control the deployment and the stowage of the associated reversers
- Adjust the associated reverse thrust.

The flight crew can move the thrust reverser lever backward the stowed detent (to the IDLE REV detent or MAX REV stop), when the associated thrust lever is set to the Idle (0) stop.

Ident.: DSC-70-90-20-40-00019025.0001001 / 18 MAY 22

A/THR INSTINCTIVE DISCONNECT pb

Pressing the A/THR INSTINCTIVE DISCONNECT pb disconnects the A/THR.

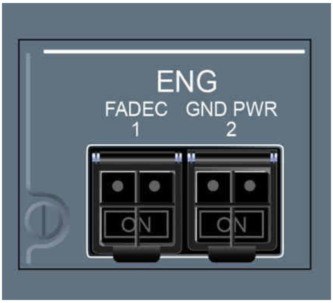
L2 For more information about the A/THR INSTINCTIVE DISCONNECT pb, *Refer to DSC-22_30-50-40 A/THR Disconnection*.

ENG FADEC GND PWR PANEL

Applicable to: ALL

Ident.: DSC-70-90-30-10-00019011.0001001 / 21 MAR 16

ENG FADEC GND PWR Panel



Ident.: DSC-70-90-30-10-00019012.0001001 / 14 FEB 17

ENG FADEC GND PWR pb

Off	:	The electrical network of the aircraft or the FADEC alternator automatically supplies the FADEC.
ON	:	On ground, when pressed the electrical network of the aircraft supplies the FADEC for 5 min, when: - The ENG FIRE pb-sw is not pressed - The FADEC alternator does not supply the FADEC. The ON light comes on 2 s after the ENG FADEC GND PWR pb is pushed.

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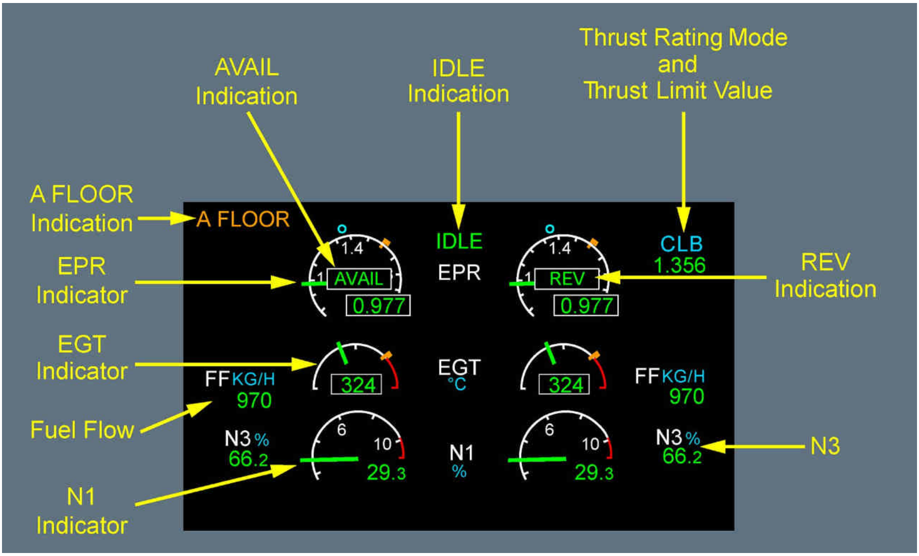
ENGINE/WARNING DISPLAY

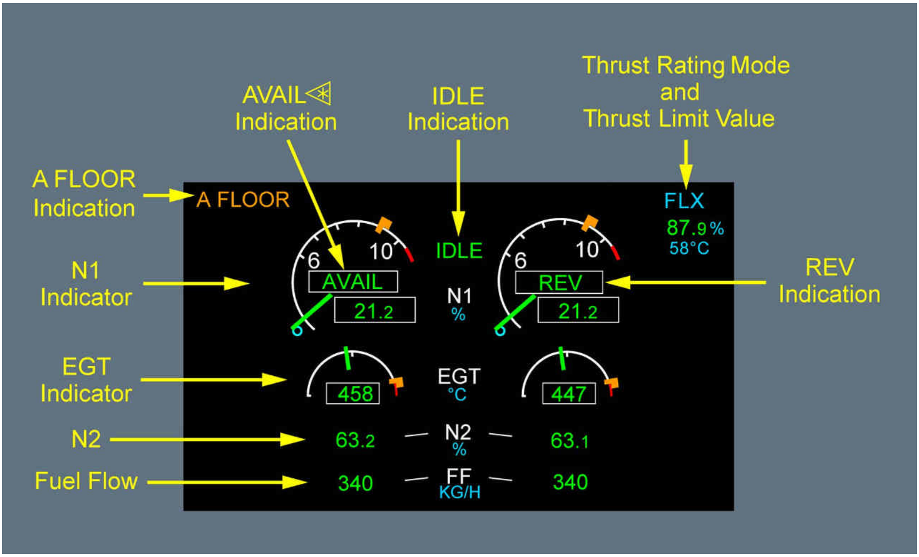
Ident.: DSC-70-90-40-50-00018732.0004001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

Engine/Warning Display


AVAIL Indication
IDLE Indication
Thrust Rating Mode and Thrust Limit Value
A FLOOR Indication
A FLOOR
EPR Indicator
EGT Indicator
Fuel Flow
N1 Indicator
REV Indication
N3
1.4
1
AVAIL
0.977
IDLE
EPR
REV
0.977
CLB
1.356
324
EGT
°C
324
FF KG/H
970
FF KG/H
970
N3 %
66.2
6
10
29.3
N1
%
6
10
29.3
N3 %
66.2

Ident.: DSC-70-90-40-50-00018732.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Engine/Warning Display


AVAIL Indication
IDLE Indication
Thrust Rating Mode and Thrust Limit Value
A FLOOR Indication
A FLOOR
FLX
87.9 %
58°C
N1 Indicator
6
10
AVAIL
21.2
IDLE
N1
%
REV
21.2
REV Indication
EGT Indicator
458
EGT
°C
447
N2
63.2
N2
%
63.1
Fuel Flow
340
FF
KG/H
340

Ident.: DSC-70-90-40-50-00018744.0001001 / 21 MAR 16
Applicable to: ALL

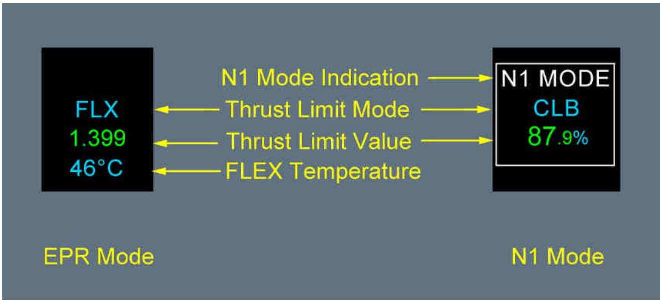
THRUST RATING MODE AND THRUST LIMIT VALUE

Indicates the thrust limit value and the associated thrust rating mode based on:

- The position of the thrust levers,
- Aircraft on ground or in flight,
- The engine status, i.e. running or not running,
- The data entered in the T.O and CLB panels of the FMS ACTIVE/PERF page.

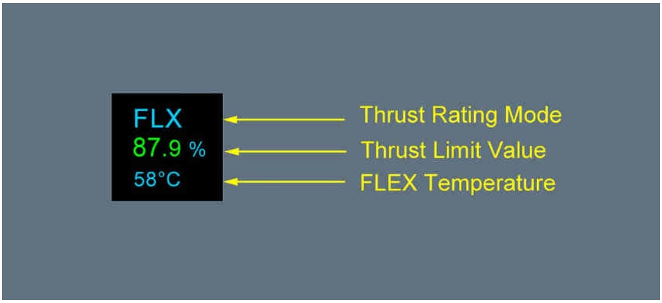
Ident.: DSC-70-90-40-50-00018747.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

Thrust Rating Mode and Thrust Limit Value


FLX
1.399
46°C
N1 Mode Indication
Thrust Limit Mode
Thrust Limit Value
FLEX Temperature
N1 MODE
CLB
87.9%
EPR Mode
N1 Mode

Ident.: DSC-70-90-40-50-00018747.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Thrust Rating Mode and Thrust Limit Value


FLX
87.9 %
58°C
Thrust Rating Mode
Thrust Limit Value
FLEX Temperature

Ident.: DSC-70-90-40-50-00018750.0003001 / 12 JUL 18
Applicable to: LV-KHT, LV-KHU

THRUST RATING MODE

The thrust rating modes are:

TOGA	:	Takeoff or go-around (TOGA) thrust rating mode is selected.
MCT	:	Maximum Continuous Thrust (MCT) rating mode is selected.
CLB	:	Climb (CLB) thrust rating mode is selected.
FLX	:	Flexible (FLX) takeoff thrust rating mode is selected.

DCLB1(2) : Derated Climb ◁ (DCLB) thrust rating mode is selected.
There are 2 levels of derated climb: DCLB1 and DCLB2.

D04 : Derated Takeoff ◁ thrust rating mode is selected.
There are several levels of derated takeoff: D04, D08, D12, D16, D20, ...

GA SOFT : Soft go-around ◁ thrust rating mode is selected.

XX in amber : There is no thrust rating mode selected, the selected rating mode is not available, or at least one engine operates in degraded N1 mode on ground.

L2 The thrust rating mode disappears when the thrust reversers are selected.

Ident.: DSC-70-90-40-50-00018750.0001001 / 12 JUL 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

THRUST RATING MODE

The thrust rating modes are:

TOGA : Takeoff or go-around (TOGA) thrust rating mode is selected.

MCT : Maximum Continuous Thrust (MCT) rating mode is selected.

CLB : Climb (CLB) thrust rating mode is selected.

FLX : Flexible (FLX) takeoff thrust rating mode is selected.

DCLB1(2) : Derated Climb ◁ (DCLB) thrust rating mode is selected.
There are 2 levels of derated climb: DCLB1 and DCLB2.

D04 : Derated Takeoff ◁ thrust rating mode is selected.
There are several levels of derated takeoff: D04, D08, D12, D16, D20, ...

GA SOFT : Soft go-around ◁ thrust rating mode is selected.

L2 The thrust rating mode disappears when the thrust reversers are selected.

Ident.: DSC-70-90-40-50-00018756.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

THRUST LIMIT VALUE

EPR value : Indicates the EPR limit value associated with the thrust rating mode, when at least one engine operates in EPR mode.

L12

N1 value : Indicates the N1 limit value associated with the thrust rating mode, when all engines operate in rated N1 mode.
The N1 MODE indication appears.

XX in amber : Indicates that the thrust limit value is not available, or that at least one engine operates in degraded N1 mode on ground.

L2 The thrust limit value disappears when the thrust reversers are selected.

Ident.: DSC-70-90-40-50-00018756.0001001 / 28 FEB 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

THRUST LIMIT VALUE

N1 value : Indicates the N1 limit value associated with the thrust rating mode.

L2 The thrust limit value disappears when the thrust reversers are selected.

Ident.: DSC-70-90-40-50-00018761.0001001 / 21 MAR 16
Applicable to: ALL

FLEX TEMPERATURE

Cyan : Indicates the flexible temperature that the flight crew entered in the T.O panel of the FMS PERF page, when the FLX rating mode is selected.

Ident.: DSC-70-90-40-50-00018763.0001001 / 21 MAR 16
Applicable to: ALL

IDLE INDICATION

Both engines are at idle speed, and the aircraft is in flight.

L2 Pulses during 10 s, and then remains steady.

Ident.: DSC-70-90-40-50-00018765.0001001 / 21 MAR 16
Applicable to: ALL

AVAIL INDICATION

The engine is started, and at or above idle.

L2 On ground, appears steady during 10 s after a successful start.
In flight, pulses during 1 min after a successful relight.
The AVAIL indication disappears when the flight crew moves the thrust lever forward the idle detent.

Ident.: DSC-70-90-40-50-00018766.0001001 / 21 MAR 16
Applicable to: ALL

REV INDICATION

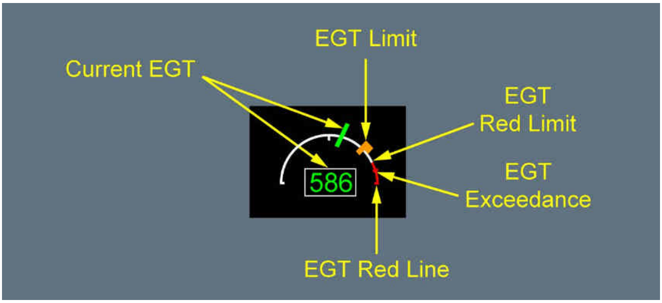
REV in green : On ground, the thrust reverser system is fully deployed.

L12

REV in amber : The thrust reverser system is unlocked.
In flight, the REV indication pulses during 9 s and then remains steady.

Ident.: DSC-70-90-40-50-00018769.0001001 / 21 MAR 16
Applicable to: ALL

EGT INDICATOR



Ident.: DSC-70-90-40-50-00018771.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

CURRENT EGT

L12

Green	:	The current EGT is in normal range. The scale goes from 0 °C to 1 200 °C.
Amber	:	The current EGT exceeds the EGT limit.

L12

Red	:	The EGT is above the EGT red limit. The current EGT: - Is between 900 °C and 920 °C for more than 20 s, or - Exceeds 920 °C.

Ident.: DSC-70-90-40-50-00018771.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

CURRENT EGT

L12

Green	:	The current EGT is in normal range. The scale goes from 0 °C to 1 200 °C.
Amber	:	The current EGT exceeds the EGT limit.
Red	:	The EGT is above the EGT red limit.

Ident.: DSC-70-90-40-50-00018773.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

EGT LIMIT

The amber line indicates the maximum EGT (i.e. the EGT limit).

L2 The maximum EGT is:
- 700 °C, during the engine start sequence on ground, or
- 900 °C, in all other cases.

The EGT limit does not appear:
- When a takeoff or a go-around mode is selected, or
- When the thrust reversers are selected, or
- If the alpha floor protection is activated.

Ident.: DSC-70-90-40-50-00018773.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

EGT LIMIT

The amber line indicates the maximum EGT (i.e. the EGT limit).

L2 The maximum EGT is:
- 750 °C, during the engine start sequence on ground, or
- 940 °C, in all other cases.

The EGT limit does not appear:
- When a takeoff or a go-around mode is selected, or
- When the thrust reversers are selected, or
- If the alpha floor protection is activated.

Ident.: DSC-70-90-40-50-00018775.0001001 / 21 MAR 16
Applicable to: ALL

EGT EXCEEDANCE

The EGT exceedance is the highest value that the EGT reached.
The EGT exceedance appears when:

- The current EGT exceeds the EGT red limit, or
- The EGT exceeded the EGT red limit.

L2 The red mark no longer appears at the next engine start sequence on ground, or after a maintenance action.

Ident.: DSC-70-90-40-50-00018776.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

EGT RED LINE

The EGT red line appears between the EGT red limit and the end of the scale.
L2 The EGT red limit is 920 °C.

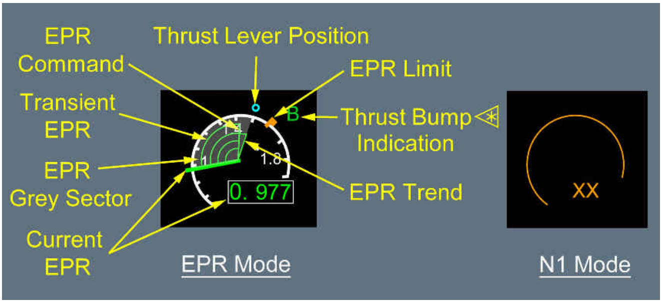
Ident.: DSC-70-90-40-50-00018776.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

EGT RED LINE

The EGT red line appears between the EGT red limit and the end of the scale.
L2 The EGT red limit is 975 °C.

Ident.: DSC-70-90-40-50-00018783.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

EPR INDICATOR


EPR Command
Thrust Lever Position
EPR Limit
Transient EPR
Thrust Bump Indication
EPR Grey Sector
EPR Trend
Current EPR
1
1.4
1.8
B
0. 977
XX
EPR Mode
N1 Mode

Ident.: DSC-70-90-40-50-00018784.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

CURRENT EPR

L12

Green	:	The current EPR is valid and the engine operates in EPR mode.
XX in amber	:	The Current EPR is not valid, or the engine operates in N1 mode. The EPR scale appears in amber. The EPR needle and the box around current the EPR value disappear.

Ident.: DSC-70-90-40-50-00018785.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

EPR TREND

The green triangle indicates the direction of the N1 trend, when the A/THR mode is active.

Ident.: DSC-70-90-40-50-00018786.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

EPR COMMAND

Indicates the EPR target, when the A/THR mode is active.

Ident.: DSC-70-90-40-50-00018787.0001001 / 03 NOV 23
Applicable to: LV-KHT, LV-KHU

TRANSIENT EPR

The four green arcs indicate the difference between the EPR command and the current EPR, when the A/THR is active.

Ident.: DSC-70-90-40-50-00018788.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

THRUST LEVER POSITION

The blue circle indicates the position of the thrust lever.
In manual mode, the blue circle corresponds to the EPR value reached after the stabilization of the engine parameters.
L2 The thrust lever position disappears when the thrust reversers are selected.

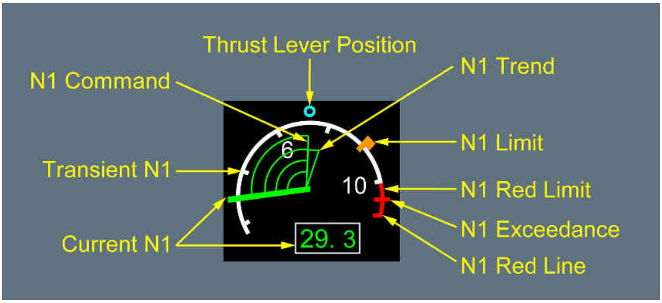
Ident.: DSC-70-90-40-50-00018789.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

EPR LIMIT

The amber mark indicates the EPR limit.
L2 This corresponds to the maximum EPR value when the thrust levers are in TO/GA detent.
The amber mark disappears when the thrust reversers are selected.

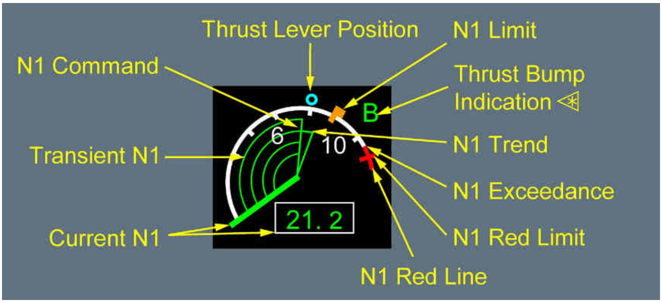
Ident.: DSC-70-90-40-50-00018792.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

N1 INDICATOR


Thrust Lever Position
N1 Command
N1 Trend
N1 Limit
Transient N1
10
6
N1 Red Limit
N1 Exceedance
Current N1
29. 3
N1 Red Line

Ident.: DSC-70-90-40-50-00018792.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N1 INDICATOR


Thrust Lever Position
N1 Limit
N1 Command
Thrust Bump Indication
B
6
10
N1 Trend
Transient N1
N1 Exceedance
21. 2
Current N1
N1 Red Limit
N1 Red Line

Ident.: DSC-70-90-40-50-00018795.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

CURRENT N1

L12 Green	:	The current N1 is in normal range. The box around current N1 appears, when the engine operates in N1 mode.
L12 Red	:	The current N1 exceeds the N1 red limit. N1 red limit is 99 %.

L12

Dashed : The accuracy of the N1 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-50-00018795.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

CURRENT N1

Green : The current N1 is in normal range.

Amber : The current N1 exceeds the N1 limit.

L12

Red : The current N1 exceeds the N1 red limit.
N1 red limit is 115.5 %.

L12

Dashed : The accuracy of the N1 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-50-00018796.0002001 / 20 MAR 17
Applicable to: LV-KHT, LV-KHU

N1 TREND

The green triangle indicates the direction of the N1 trend, when the A/THR mode is active and all engines operate in N1 mode.
For N1 trend indication applicability, *Refer to DSC-70-35-20 N1 Mode*.

Ident.: DSC-70-90-40-50-00018796.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N1 TREND

The green triangle indicates the direction of the N1 trend, when the A/THR mode is active.

Ident.: DSC-70-90-40-50-00018797.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

N1 COMMAND

Indicates the N1 target, when the A/THR mode is active, when all engines operate in N1 mode.

Ident.: DSC-70-90-40-50-00018797.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N1 COMMAND

Indicates the N1 target, when the A/THR mode is active.

Ident.: DSC-70-90-40-50-00018798.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

TRANSIENT N1

The four green arcs indicate the difference between the N1 command and the current N1, when the A/THR is active and all engines operate in N1 mode.

Ident.: DSC-70-90-40-50-00018798.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

TRANSIENT N1

The four green arcs indicate the difference between the N1 command and the current N1, when the A/THR is active.

Ident.: DSC-70-90-40-50-00018799.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

THRUST LEVER POSITION

The blue circle indicates the position of the thrust lever, when the engine operates in N1 mode.
In manual mode, the blue circle corresponds to the N1 value reached after the stabilization of the engine parameters.
L2 The thrust lever position disappears when the thrust reversers are selected.

Ident.: DSC-70-90-40-50-00018799.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

THRUST LEVER POSITION

The blue circle indicates the position of the thrust lever.
In manual mode, the blue circle corresponds to the N1 value reached after the stabilization of the engine parameters.

Ident.: DSC-70-90-40-50-00018800.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

N1 LIMIT

The amber mark indicates the N1 limit.
L2 This corresponds to the maximum N1 value:

- When the thrust levers are in TO/GA detent and the engine operates in rated N1 mode, or
- When the thrust levers are in MAX REV position.

Ident.: DSC-70-90-40-50-00018800.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N1 LIMIT

The amber mark indicates the N1 limit.

L2 This corresponds to the maximum N1 value when the thrust levers are in TO/GA detent or in the MAX REV position.

Ident.: DSC-70-90-40-50-00018802.0001001 / 21 MAR 16
Applicable to: ALL

N1 EXCEEDANCE

The N1 exceedance is the highest value that the N1 reached.
The N1 exceedance appears when the current N1 exceeds the N1 red limit.
The N1 exceedance remains even if the N1 value decreases below the N1 red limit.

L2 The red mark no longer appears at the next engine start sequence on ground, or after a maintenance action.

Ident.: DSC-70-90-40-50-00018804.0002001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

N1 RED LINE

The N1 red line appears between the N1 red limit and the end of the scale.

L2 The N1 red limit is 99 %.

Ident.: DSC-70-90-40-50-00018804.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N1 RED LINE

The N1 red line appears between the N1 red limit and the end of the scale.

L2 The N1 red limit is 115.5 %.

Ident.: DSC-70-90-40-50-00018805.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N2

In a grey box : The engine start sequence or the crank process is in progress.
Green : N2 is in normal range.

L12

Red : N2 exceeds the N2 red limit.
N2 red limit is 113 %.
A red cross appears.
The red cross no longer appears at the next engine start sequence on ground, or after a maintenance action.

L12

Dashes : The accuracy of the N2 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-50-00018824.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

N3

In a grey box : The engine start sequence or the crank process is in progress.

Green : N3 is in normal range.

L12

Red : N3 exceeds the N3 red limit.
N3 red limit is 100 %.
A red cross appears.
The red cross no longer appears at the next engine start sequence on ground, or after a maintenance action.

L12

Dashes : The accuracy of the N3 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-50-00018829.0001001 / 05 MAR 19
Applicable to: ALL

THRUST BUMP INDICATION

B The thrust bump is engaged.

Ident.: DSC-70-90-40-50-00019589.0001001 / 21 MAR 16
Applicable to: ALL

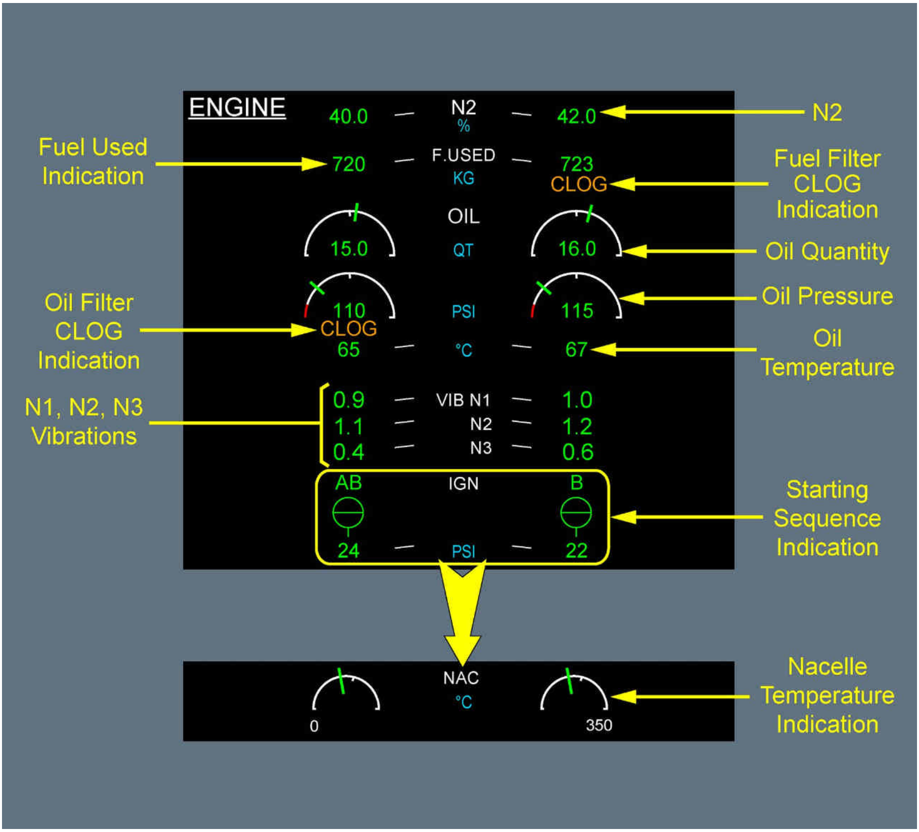
MEMO DISPLAY

IGNITION : This message is displayed in green, either when selected automatically by the FADEC or manually by the crew.

ENG SD PAGE

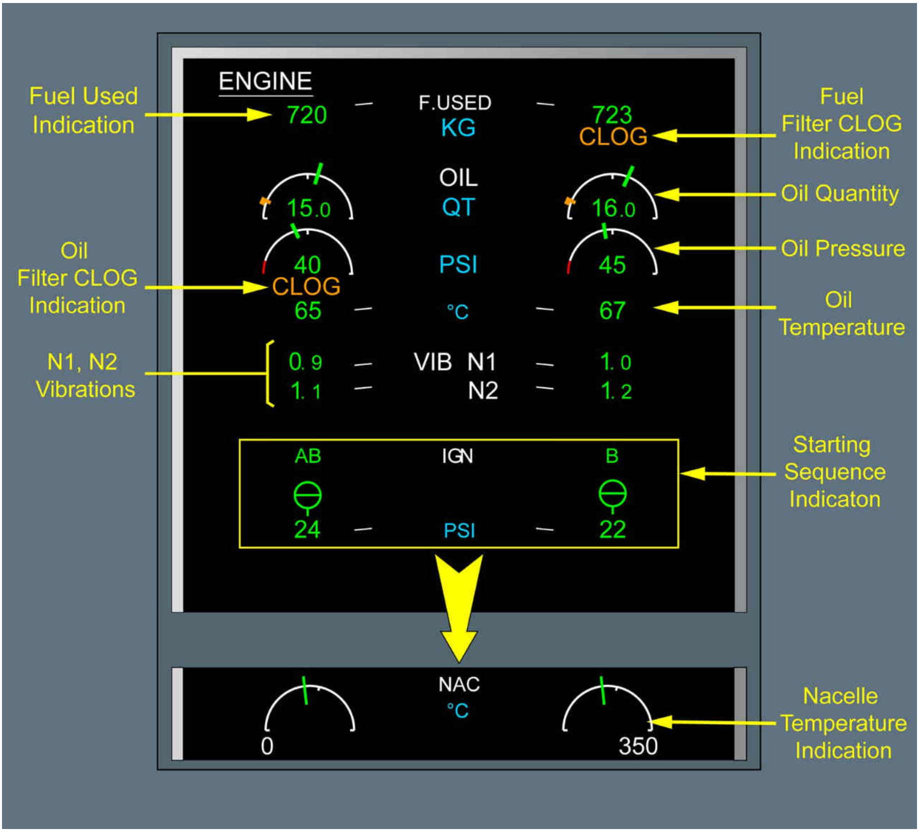
Ident.: DSC-70-90-40-60-00018831.0004001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

ENG SD page


ENGINE
40.0
N2
%
42.0
N2
Fuel Used Indication
720
F.USED
KG
723
CLOG
Fuel Filter CLOG Indication
OIL
15.0
QT
16.0
Oil Quantity
110
PSI
115
Oil Pressure
Oil Filter CLOG Indication
CLOG
65
°C
67
Oil Temperature
N1, N2, N3 Vibrations
0.9
VIB N1
1.0
1.1
N2
1.2
0.4
N3
0.6
AB
IGN
B
24
PSI
22
Starting Sequence Indication
NAC
°C
0
350
Nacelle Temperature Indication

Ident.: DSC-70-90-40-60-00018831.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ENG SD page


ENGINE
Fuel Used Indication
720
F.USED
KG
723
CLOG
Fuel Filter CLOG Indication
OIL
QT
15.0
16.0
Oil Quantity
PSI
40
45
Oil Pressure
Oil Filter CLOG Indication
CLOG
65
°C
67
Oil Temperature
N1, N2 Vibrations
0. 9
1. 1
VIB N1
N2
1. 0
1. 2
AB
IGN
B
24
PSI
22
Starting Sequence Indicaton
NAC
°C
0
350
Nacelle Temperature Indication

Ident.: DSC-70-90-40-60-00018832.0003001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

N2

Green : N2 is in normal range.

L12

Red : N2 exceeds the N2 red limit.
N2 red limit is 103.3 %.
A red cross appears.
The red cross no longer appears at the next engine start sequence on ground, or after a maintenance action.

L12

Dashed : The accuracy of the N2 measurement is degraded.
Two amber dashes appear over the last digit.

Ident.: DSC-70-90-40-60-00018852.0001001 / 21 MAR 16
Applicable to: ALL

FUEL USED INDICATION

L12

Green : Indicates the fuel used by each engine.
This value automatically resets on ground, at the next engine start.
Appears in multiples of 10 kg (20 lb).

L12

Dashed : The value accuracy is degraded.
Two amber dashes appear over all five digits.
This occurs when the Fuel Flow is not valid in flight, for more than 1 min.

Ident.: DSC-70-90-40-60-00018853.0001001 / 21 MAR 16
Applicable to: ALL

FUEL FILTER CLOG INDICATION

Indicates that the pressure loss across the fuel filter is excessive.

Ident.: DSC-70-90-40-60-00018854.0006001 / 31 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

OIL QUANTITY

L12

Green : The oil quantity is in normal range.
The scale goes from 0 to 30 QT.

L12

Pulses green : The needle and the oil quantity value pulse green.
The advisory limit is 2.5 QT.

Ident.: DSC-70-90-40-60-00018854.0004001 / 12 JUL 18
Applicable to: LV-KHT, LV-KHU

OIL QUANTITY

L12

Green	The oil quantity is in normal range. The scale goes from 0 to 22 QT.
Pulses green	The needle and the oil quantity value pulse green. The advisory limit is 4 QT.

L12

Ident.: DSC-70-90-40-60-00018855.0004001 / 12 JUL 18
Applicable to: LV-KHT, LV-KHU

OIL PRESSURE

L12

Green	The oil pressure is in normal range. The scale goes from 0 to 250 PSI.
Red	The oil pressure is in the red range. The red range is between 0 and 25 PSI.

L12

Ident.: DSC-70-90-40-60-00018855.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

OIL PRESSURE

L12

Green	The oil pressure is in normal range. The scale goes from 0 to 100 PSI.
Red	The oil pressure is in the red range. The red range is between 0 and 10 PSI.

L12

Ident.: DSC-70-90-40-60-00018856.0004001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

OIL TEMPERATURE

Green	The oil temperature is in normal range.
Amber	The oil temperature is above 190 °C.

Ident.: DSC-70-90-40-60-00018856.0002001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

OIL TEMPERATURE

Green	The oil temperature is in normal range.

Pulses green	:	The oil temperature is above 160 °C for less than 15 min.
Amber/red	:	The oil temperature is above 160 °C for more than 15 min, or above 175 °C.

Ident.: DSC-70-90-40-60-00018857.0001001 / 21 MAR 16
Applicable to: ALL

OIL FILTER CLOG INDICATION

Indicates that the pressure loss across the oil filter is excessive.

Ident.: DSC-70-90-40-60-00018858.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

N1, N2 VIBRATIONS

Green	:	The vibration of the LP (HP) rotor is in normal range.
Pulses green	:	The level of LP (HP) rotor vibration is excessive.

Ident.: DSC-70-90-40-60-00018859.0001001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

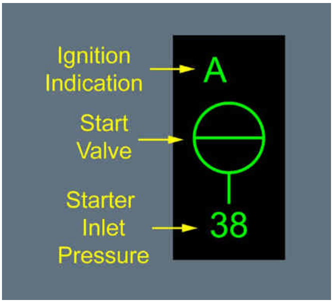
N1, N2, N3 VIBRATIONS

Green	:	The vibration of the LP (IP) (HP) rotor is in normal range.
Pulses green	:	The level of LP (IP) (HP) rotor vibration is excessive.

Ident.: DSC-70-90-40-60-00018860.0001001 / 21 MAR 16
Applicable to: ALL

STARTING SEQUENCE INDICATION

During the engine start sequence, the starting sequence indication appears on the ENG SD page.



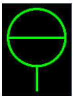
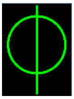
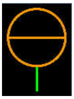
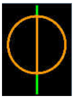
Ident.: DSC-70-90-40-60-00018861.0001001 / 21 MAR 16
Applicable to: ALL

IGNITION INDICATION

A	:	The igniter A(B) is used for the engine start sequence.
A B	:	Both igniters A and B are used for the engine start sequence or continuous ignition.

Ident.: DSC-70-90-40-60-00018862.0001001 / 21 MAR 16
Applicable to: ALL

START VALVE

	:	The engine start valve is fully closed.
	:	The engine start valve is fully open.
	:	The engine start valve failed in the closed position.
	:	The engine start valve failed in the open position.

Ident.: DSC-70-90-40-60-00018864.0004001 / 21 MAR 16
Applicable to: LV-KHT, LV-KHU

STARTER INLET PRESSURE

Green	:	The starter inlet pressure is normal.
Amber	:	The starter inlet pressure is either: - Abnormally high, or - Abnormally low (below 15 PSI, when N3 is above 8 % and the starter valve is not closed).

Ident.: DSC-70-90-40-60-00018864.0001001 / 21 MAR 16
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

STARTER INLET PRESSURE

Green	:	The starter inlet pressure is normal.
Amber	:	The starter inlet pressure is either: - Abnormally high, or - Abnormally low (below 21 PSI, when N2 is above 10 % and the starter valve is not closed).

Ident.: DSC-70-90-40-60-00018866.0002001 / 21 MAR 16
Applicable to: ALL

NACELLE TEMPERATURE INDICATION

L12

Green	:	The nacelle temperature is normal.
Pulses green	:	The nacelle temperature goes above the advisory limit, that correspond to the white dash. The advisory limit is 260 °C.

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ERRONEOUS ENGINE FUEL LEAK DETECTION

Ident.: DSC-70-100-00024301.0004001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO

DESCRIPTION

A spurious display of the ENG 1(2) FUEL LEAK alert may occur on an engine that is not affected by a fuel leak.
One of the triggering conditions of the ENG 1(2) FUEL LEAK alert is a comparison between the fuel flows on both engines. A misbehaviour of an engine may cause the fuel flow of this engine to decrease. In this case, if both thrust levers are in the same position, the FWC may erroneously consider that a fuel leak affects the engine that has the highest fuel flow.
The ENG 1(2) FUEL LEAK alert requires the flight crew to shutdown the affected engine, if they confirm the fuel leak.
For more information about the fuel leak detection, *Refer to PRO-ABN-FUEL [QRH] FUEL LEAK*.

OPERATIONAL RECOMMENDATION

Before the flight crew considers an engine shutdown, they should check engine and fuel parameters on both engines (e.g. N1, FOB, FU, fuel flow, fuel distribution, fuel imbalance) in order to confirm the leak.
For more information about the fuel leak, *Refer to FCTM/PR-AEP-FUEL Fuel Leak*.

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<tr><td></td><td colspan="4">Criteria: D44364, S11963, S16531, A330
Applicable to: LV-GKO, LV-GKP
<i>Impacted DU: 00010900 Batteries Check/Setup</i></td></tr>
<tr><td></td><td>PRO-NOR-SOP-10</td><td>Taxi</td><td>FG01051</td><td></td></tr>
<tr><td></td><td>PRO-NOR-SOP-10</td><td>Taxi - Radar</td><td>00015144.0004001</td><td>03 NOV 22</td></tr>
<tr><td></td><td colspan="4">Criteria: 34-3180, 34-3227, LR
Applicable to: LV-GKP
<i>Impacted DU: 00015141 Taxi - Radar</i></td></tr>
<tr><td></td><td>PRO-NOR-SOP-14</td><td>Climb</td><td>FG01066</td><td></td></tr>
<tr><td></td><td>PRO-NOR-SOP-14</td><td>Climb - Radar</td><td>00012986.0003001</td><td>28 NOV 23</td></tr>
<tr><td></td><td colspan="4">Criteria: 34-3180, 34-3227, LR
Applicable to: LV-GKP
<i>Impacted DU: 00012134 Climb - Radar</i></td></tr>
<tr><td></td><td colspan="4"><i><u>Reason for issue:</u></i>
<i>When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft.</i>
<i>In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path.</i>
<i>At low altitudes (below FL200), the tilt is adjusted upward to manage clutter from strong ground targets. In some cases, the weather may be low-lying and therefore may be below the radar beam and not be displayed until the aircraft descends closer to the precipitation level.</i>
<i>Therefore, this Temporary Revision is issued to indicate that, when the Multiscan is in the AUTO position, the GAIN should be manually set to +4 when the aircraft is below FL200.</i>

<i>In addition, the flight crew should temporarily set the MULTISCAN switch to MAN, if:</i>
- <i>If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes.</i>
- <i>The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique.</i>
- <i>In particular below FL200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display.</i>

<i>In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.</i></td></tr>
<tr><td></td><td>PRO-NOR-SOP-15</td><td>Cruise</td><td>FG00842</td><td></td></tr>
<tr><td></td><td>PRO-NOR-SOP-15</td><td>Cruise - Radar</td><td>00013075.0003001</td><td>09 NOV 21</td></tr>
<tr><td></td><td colspan="4">Criteria: 34-3180, 34-3227, LR
Applicable to: LV-GKP
<i>Impacted DU: 00011074 Cruise - Radar</i></td></tr>
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M (1)	**Localization**	**DU Title**	**DU identification**	**DU date**

Reason for issue:

When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft.
In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path.
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- *In particular below FL200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display.*

In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

	PRO-NOR-SOP-16	**Descent Preparation**	FG01074	
	PRO-NOR-SOP-16	**Descent Preparation - Radar**	00012996.0003001	09 NOV 21

Criteria: 34-3180, 34-3227, A330

Applicable to: LV-GKP

Impacted DU: 00011969 Descent Preparation - Radar

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M [(1)]	Localization	DU Title	DU identification	DU date

Reason for issue:

When in the AUTO position, the MultiScan AUTO mode adjusts the tilt according to the altitude of the aircraft.
In cruise, MULTISCAN function provides a large view of the weather ahead, ie display of weather cells located on and below aircraft path.
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- *The weather display is ambiguous or unexpected, in order to better analyze the weather situation using manual tilt according to standard technique.*
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M	Localization	DU Title	DU identification	DU date
	PRO-NOR-SOP-18-B	**Initial Approach**	FG01213	
	PRO-NOR-SOP-18-B	**Initial Approach - Radar**	00014535.0005001	09 NOV 21

Criteria: 34-3180, 34-3227, LR
Applicable to: LV-GKP
Impacted DU: 00014476 Initial Approach - Radar

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</table>

(1) Evolution code : N=New, R=Revised, E=Effectivity

PROCEDURES

ABNORMAL AND EMERGENCY PROCEDURES

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ENG 1(2) START VALVE FAULT .... BE
■ ENG 1(2) THR LEVER ABV IDLE ■ .... BF
ENG 1(2) THR LEVER DISAGREE .... BG
ENG 1(2) THR LEVER FAULT .... BH
ENG 1(2) THRUST LIMITED .... BI
■ ENG 1(2) TURBINE OVHT ■ .... BJ
ENG 1(2) XWIND PROT FAULT .... BK

Continued on the following page

Continued from the previous page

ENG EPR MODE RECOVERABLE........BL
ENG RISK OF STATOR ICING........BM
ENG T.O THRUST DISAGREE........BN
ENG THR LEVERS NOT SET........BO
ENG THRUST LOCKED........BP
ENG THRUST LOSS........BQ
ENG TYPE DISAGREE........BR

PRO-ABN-F_CTL F/CTL

[QRH] Landing with Slats or Flaps Jammed........A
[QRH] No Flaps no Slats Landing........B
[QRH] RUDDER JAM / RUDDER PEDAL JAM........C
[QRH] RUDDER TRIM RUNAWAY........D
F/CTL AIL SERVO FAULT........E
F/CTL ALTN LAW........F
F/CTL DIRECT LAW........G
F/CTL ELEV REDUND LOST (AILERONS ARE NOT PRESET)........H
F/CTL ELEV REDUND LOST (AILERONS ARE PRESET UPWARDS)........I
F/CTL ELEV SERVO FAULT........J
F/CTL FCDC 1(2) FAULT........K
F/CTL FCDC 1+2 FAULT........L
F/CTL FLAPS FAULT/LOCKED........M
[redacted] F/CTL FLAP LVR NOT ZERO [redacted]........N
F/CTL FLAP SYS 1(2) FAULT........O
F/CTL FLAP/MCDU DISAGREE........P
F/CTL FLAPS/SLATS FAULT/LOCKED........Q
F/CTL GND SPLR NOT ARMED........R
F/CTL GND SPLR FAULT........S
F/CTL L(R) ELEV FAULT........T
[redacted] F/CTL L+R ELEV FAULT [redacted]........U
F/CTL L(R) INR(OUTR) AIL FAULT........V
F/CTL L(R) SIDESTICK FAULT........W
F/CTL FLAPs LEVER OUT OF DETENT X
F/CTL PEDAL SENSOR FAULT........Y
F/CTL PITCH TRIM/MCDU/CG DISAGREE........Z
F/CTL PRIM 1(2)(3) FAULT........AA
F/CTL RUD PRIM (SEC) 1 FAULT........AB

Continued on the following page

Continued from the previous page

F/CTL PRIM 1(2)(3) (SEC1)(2) PITCH FAULT.......AC
F/CTL RUD B(Y)(G) SERVO FAULT.......AD
F/CTL RUD NORM CTL FAULT.......AE
F/CTL RUD PEDAL FAULT.......AF
F/CTL RUD TRIM 1(2) FAULT.......AG
F/CTL RUD TRIM FAULT.......AH
F/CTL RUDDER FAULT.......AI
F/CTL SEC 1(2) FAULT.......AJ
F/CTL SENSOR FAULT.......AK
F/CTL SLAT (FLAP) TIP BRK FAULT.......AL
F/CTL SLAT SYS 1(2) FAULT.......AM
F/CTL SLATS FAULT/LOCKED.......AN
F/CTL SPD BRK DISAGREE.......AO
F/CTL SPD BRK FAULT.......AP
F/CTL SPD BRK STILL OUT.......AQ
F/CTL SPLR FAULT.......AR
F/CTL STAB CTL FAULT.......AS
F/CTL TURB DAMP FAULT.......AT

PRO-ABN-FUEL FUEL

[QRH] FUEL IMBALANCE.......A
[QRH] FUEL JETTISON.......B
[QRH] FUEL LEAK.......C
[QRH] FUEL LOSS REDUCTION.......D
[QRH] FUEL OVERREAD.......E
[QRH] Gravity Fuel Feeding.......F
[QRH] TRIM TANK FUEL UNUSABLE.......G
FUEL AFT XFR FAULT.......H
FUEL ABNORM MAN FWD XFR.......I
FUEL APU AFT PUMP FAULT.......J
FUEL APU LP VALVE FAULT.......K
FUEL CELL NOT FULL.......L
FUEL CTR TK XFR FAULT.......M
FUEL CTR TO INNER FAULT.......N
FUEL ENG 1(2) FEEDLINE BURST.......O
FUEL ENG 1(2) LP VALVE FAULT.......P
[redacted] FUEL EXCESS AFT CG [redacted].......Q
FUEL FCMC 1(2) FAULT.......R

Continued on the following page

Continued from the previous page

FUEL FCMC 1+2 FAULT.......... S
FUEL F.USED/FOB DISAGREE.......... T
FUEL FUEL LO TEMP.......... U
FUEL INERTING SYS FAULT.......... V
FUEL JETTISON FAULT.......... W
FUEL JETTISON NOT CLOSED.......... X
FUEL L(R) CTR PUMP LO PR.......... Y
FUEL L + R CTR PUMPS LO PR.......... Z
FUEL L(R) INNER TK HI TEMP.......... AA
FUEL L(R) STBY PUMP LO PR.......... AB
FUEL L(R) WING PUMPS LO PR (THE FAILURE IS DUE TO AN ENGINE FEED LINE RUPTURE).......... AC
FUEL L(R) WING PUMPS LO PR (THE FAILURE IS NOT DUE TO AN ENGINE FEED LINE RUPTURE).......... AD
FUEL L(R) WING TK LO LVL.......... AE
FUEL L + R WING TK LO LVL.......... AF
FUEL LEFT (RIGHT) PUMP 1(2) LO PR.......... AG
FUEL MAN XFR COMPLETED.......... AH
FUEL NO WEIGHT/CG DATA.......... AI
FUEL OUTR TO INR FAULT.......... AJ
FUEL T TANK XFR FAULT.......... AK
FUEL TRIM LINE FAULT (TRIM LINE ISOLATION VALVE FAILED OPEN AND CENTER TANK NOT EMPTY).. AL
FUEL TRIM LINE FAULT (TRIM TANK ISOLATION FAULT).......... AM
FUEL TRIM TANK PUMP LO PR .... AN
FUEL WING TK OVERFLOW.......... AO
FUEL WING X FEED FAULT.......... AP
FUEL ZFW ZFCG DISAGREE.......... AQ

PRO-ABN-FWS FWS

FWS ECP FAULT.......... A
FWS FWC 1(2) FAULT.......... B
FWS FWC 1+2 FAULT.......... C
FWS OEB/FWC DISCREPANCY.......... D
FWS SDAC 1(2) FAULT.......... E
FWS SDAC 1+2 FAULT.......... F

Continued on the following page

Continued from the previous page

PRO-ABN-HYD HYD

HYD B ENG 1 PUMP LO PR....A
HYD B RSVR LO AIR PR....B
HYD B RSVR LO LVL....C
HYD B RSVR OVHT....D
HYD G ENG 1 (2) PUMP LO PR....E
HYD G ENG 1 + 2 PUMP LO PR....F
HYD G RSVR LO AIR PR....G
HYD G RSVR LO LVL....H
HYD G RSVR OVHT....I
HYD G RSVR UNDERFILLED (ON GROUND)....J
HYD G SYS LEAK....K
HYD G (B) (Y) ELEC PUMP FAULT....L
HYD Y ENG 2 PUMP LO PR....M
HYD Y RSVR LO AIR PR....N
HYD Y RSVR LO LVL....O
HYD Y RSVR OVHT....P
[redacted] HYD B + Y SYS LO PR [redacted]....Q
[redacted] HYD G + B SYS LO PR [redacted]....R
[redacted] HYD G + Y SYS LO PR [redacted]....S
HYD MONITORING FAULT....T
HYD RAT FAULT (ON GROUND)....U

PRO-ABN-LG L/G

[QRH] LANDING with Abnormal L/G....A
[QRH] L/G GRAVITY EXTENSION....B
NWS OVERSTEER....C
L/G DOORS NOT CLOSED....D
[redacted] L/G GEAR NOT DOWN [redacted]....E
[redacted] L/G GEAR NOT DOWNLOCKED [redacted]....F
L/G GEAR NOT UPLOCKED (L/G DOORS CLOSED)....G
L/G GEAR NOT UPLOCKED (L/G DOORS NOT CLOSED)....H

Continued on the following page

Continued from the previous page

L/G GEAR UPLOCK FAULT.....I
L/G L (R) LENGTHENING FAULT.....J
L/G LGCIU 1(2) FAULT.....K
L/G LGCIU 1+2 FAULT.....L
L/G RETRACTION FAULT.....M
L/G SYS DISAGREE.....N

PRO-ABN-MISC MISC

■ [MEM] EMER DESCENT ■.....A
■ [MEM] Stall Recovery ■.....B
■ [MEM] Stall Warning At Liftoff ■.....C
[QRH] BOMB ON BOARD.....D
[QRH] COCKPIT WINDSHIELD / WINDOW ARCING.....E
[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED.....F
■ [QRH] DITCHING ■.....G
■ [QRH] EMER EVAC ■.....H
■ [QRH] EMER LANDING ALL ENG FAILURE ■.....I
■ [QRH] FORCED LANDING ■.....J
[QRH] Overweight Landing.....K
[QRH] Severe Turbulence.....L
[QRH] TAILSTRIKE.....M
[QRH] VOLCANIC ASH ENCOUNTER.....N

PRO-ABN-NAV NAV

[MEM] Unreliable Speed Indication.....A
[QRH] Abnormal V Alpha Prot.....B
[QRH] ADR CHECK PROC.....C
■ [QRH] ALL ADR OFF ■.....D
[QRH] IR ALIGNMENT IN ATT MODE.....E
NAV ADR 1(2)(3) FAULT.....F
NAV ADR 1+2(1+3)(2+3) FAULT.....G
■ NAV ADR 1+2+3 FAULT ■.....H
NAV ADR DISAGREE.....I
NAV ALT DISCREPANCY.....J
NAV ALTI DISCREPANCY.....K
NAV AOA DISAGREE.....L
NAV CAPT (F/O) (STBY) AOA FAULT.....M
NAV ADS-B RPTG 1(2) FAULT.....N
NAV ATC/XPDR 1(2) FAULT.....O

Continued on the following page

Continued from the previous page

NAV ATC/XPDR 1+2 FAULT.......... P
NAV ATC/XPDR STBY.......... Q
NAV ATT DISCREPANCY.......... R
NAV BARO REF DISCREPANCY.......... S
NAV BARO VALUE DISAGREE.......... T
NAV BKUP SPD/ALT ON CAPT(F/O) PFD.......... U
NAV BKUP SPD/ALT ON CAPT+F/O PFD.......... V
NAV EXTREME LATITUDE.......... W
NAV FM/GPS POS DISAGREE X
NAV FM/IR POS DISAGREE.......... Y
NAV GPS 1 (2) FAULT .... Z
NAV GPWS FAULT.......... AA
NAV GPWS TERR DET FAULT.......... AB
NAV HDG DISCREPANCY.......... AC
NAV IAS DISCREPANCY.......... AD
NAV ILS 1(2)(1+2) FAULT.......... AE
NAV IR 1(2)(3) FAULT.......... AF
NAV IR 1+2(1+3)(2+3) FAULT.......... AG
NAV IR DISAGREE.......... AH
NAV IR NOT ALIGNED.......... AI
NAV LS TUNING DISAGREE.......... AJ
NAV L(R) CAPT(F/O) STATIC FAULT.......... AK
NAV PRED W/S DET FAULT .... AL
NAV RA 1(2) FAULT.......... AM
NAV RA 1+2 FAULT.......... AN
NAV RA DEGRADED.......... AO
NAV TCAS FAULT.......... AP
NAV TCAS STBY.......... AQ
STALL WARNING .... AR

PRO-ABN-OVERSPEED OVERSPEED

OVERSPEED .... A

PRO-ABN-RECORDER RECORDER

RECORDER CVR FAULT.......... A
RECORDER DFDR FAULT.......... B
RECORDER FDIU FAULT.......... C

Continued on the following page

Continued from the previous page

RECORDER SYS FAULT.......... D

PRO-ABN-SEVERE_ICE SEVERE ICE

SEVERE ICE DETECTED.......... A

PRO-ABN-SMOKE SMOKE

■ [QRH] SMOKE / FUMES / AVNCS SMOKE ■.......... A
■ [QRH] REMOVAL OF SMOKE / FUMES ■.......... B
[QRH] SMOKE / FIRE FROM LITHIUM BATTERY.......... C
■ SMOKE AFT/BULK CRG SMOKE ■.......... D
SMOKE AVIONICS DET FAULT.......... E
■ SMOKE AVNCS VENT SMOKE ■.......... F
SMOKE BBAND DET FAULT ◁ .... G
■ SMOKE BULK AVN SMOKE ■.......... H
SMOKE BULK DET FAULT ◁ I
SMOKE BULK REST BTL 1(2) ◁ .... J
■ SMOKE BULK REST SMOKE ◁ ■.......... K
■ SMOKE CAB REST SMOKE ◁ ■.......... L
■ SMOKE CAB VIDEO 1(2)(3)(4) SMOKE ◁ ■.......... M
SMOKE DET FAULT.......... N
SMOKE FLT (CAB) REST DET FAULT ◁ .... O
■ SMOKE FLT REST SMOKE ◁ ■.......... P
SMOKE FWD (AFT/BULK) CRG DET FAULT.......... Q
■ SMOKE FWD CRG SMOKE ■.......... R
SMOKE IFE BAY DET FAULT ◁ .... S
■ SMOKE IFE BAY SMOKE ◁ ■.......... T
SMOKE LAVATORY DET FAULT.......... U
■ SMOKE LAVATORY SMOKE ■.......... V
SMOKE FWD (AFT) CRG BTL 1(2) FAULT.......... W
■ SMOKE PAX BBAND SMOKE ◁ ■.......... X
SMOKE VIDEO 1(2)(3)(4) DET FAULT ◁ .... Y

Continued on the following page

Continued from the previous page

PRO-ABN-SURV SURV

[MEM] EGPWS Cautions....A
[redacted] [MEM] EGPWS Warnings [redacted]....B
[MEM] TCAS CAUTION - TRAFFIC ADVISORY....C
[redacted] [MEM] TCAS WARNING - RESOLUTION ADVISORY [redacted]....D
[redacted] [MEM] WINDSHEAR WARNING - REACTIVE WINDSHEAR [redacted]....E
SURV ROW/ROP LOST....F

PRO-ABN-T-O T.O

T.O SPEEDS NOT INSERTED....A
T.O SPEEDS TOO LOW....B
T.O V1/VR/V2 DISAGREE....C

PRO-ABN-VENT VENT

VENT BLOWING FAULT....A
VENT EXTRACT FAULT....B
VENT GND COOL FAULT ◁....C
VENT OVBD VALVE FAULT....D
VENT PACK BAY VENT FAULT....E

PRO-ABN-WHEEL WHEEL

[QRH] WHEEL TIRE DAMAGE SUSPECTED....A
WHEEL HYD SEL VALVE....B
WHEEL N/W STRG FAULT....C
WHEEL TIRE LO PR ◁....D

PRO-ABN-90 Detailed Cabin / Cockpit Evacuation Procedure

General....A
Cockpit-Assigned Duties for Evacuation....B
Cabin Crew-Assigned Areas for Evacuation....C
Communications....D
On Ground Evacuation....E
Cockpit Evacuation Through Window....F
Evacuation on Water....G

Localization Title	Toc Index	ID	Reason
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-PLP-TOC System Reset Table		1	Documentation update: Deletion of "System Reset Table - COM (00016078.0001001)".
PRO-ABN-ABN-RST System Reset Table - COM	B	1	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ABN-RST System Reset Table - COM	B	2	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ABN-RST System Reset Table - COM	B	3	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ABN-RST System Reset Table - COM	B	4	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ABN-RST System Reset Table - COM	B	5	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ABN-RST System Reset Table - COM	B	6	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ABN-RST System Reset Table - COM	B	7	Documentation update: Addition of "System Reset Table - COM" documentary unit
PRO-ABN-ENG ENG ALL ENGINES FAILURE	O	1	Documentation update: Addition of "ENG ALL ENGINES FAILURE" documentary unit
PRO-ABN-F_CTL F/CTL L + R ELEV FAULT - FWSPAGE	U	1	Documentation update: Addition of "F/CTL L + R ELEV FAULT - FWSPAGE" documentary unit
PRO-ABN-BRAKES BRAKES PARK BRK FAULT	F	1	Effectivity update: The information now also applies to LV-KAO.
PRO-ABN-BRAKES BRAKES PARK BRK FAULT	F	2	Effectivity update: The information now also applies to LV-KAO.
PRO-ABN-F_CTL F/CTL L + R ELEV FAULT - FWSPAGE	U	2	Effectivity update: The information now also applies to LV-KAN, LV-KAO, LV-KHU, LV-FVI. The information no longer applies to all ACN.

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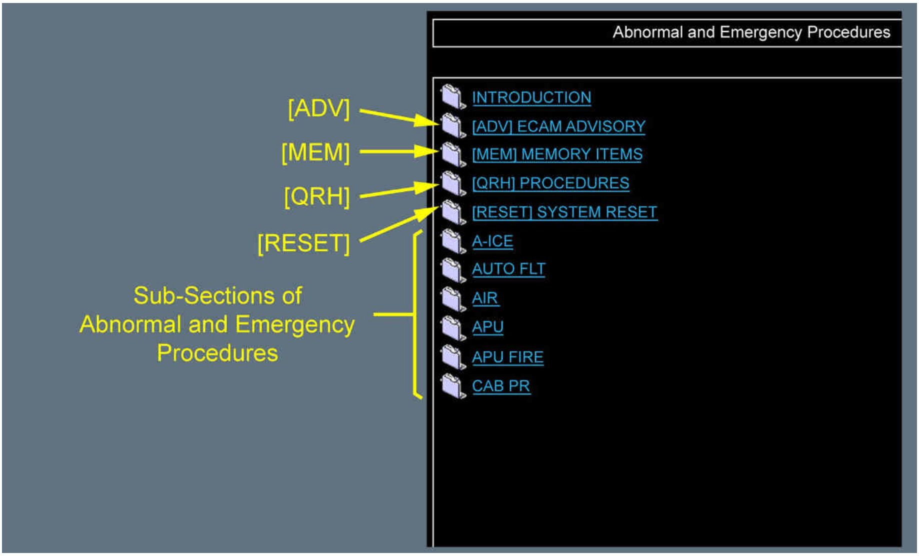
CONTENT

Ident.: PRO-ABN-ABN-00-00020762.0001001 / 09 NOV 20
Applicable to: ALL

Abnormal and Emergency procedures involve actions that the flight crew must perform to ensure the overall safety of the flight, and adequate workload.

L2 For more information about the management of abnormal operations, *Refer to FCTM/AOP-30-10 Introduction*.

Abnormal and Emergency Procedure Overview


Abnormal and Emergency Procedures
[ADV]
[MEM]
[QRH]
[RESET]
Sub-Sections of Abnormal and Emergency Procedures
INTRODUCTION
[ADV] ECAM ADVISORY
[MEM] MEMORY ITEMS
[QRH] PROCEDURES
[RESET] SYSTEM RESET
A-ICE
AUTO FLT
AIR
APU
APU FIRE
CAB PR

L1 [ADV] ECAM ADVISORY

The [ADV] ECAM ADVISORY section provides direct access to the list of all advisories that can be displayed on the ECAM SD pages. The [ADV] section is also available in the QRH.

L2 For more information, *Refer to [ADV] ECAM Advisory*.

L1 Advisories are system parameters that start to deviate from their usual operational range. However, an advisory does not require flight crew actions, except monitoring.

L2 For more information about Advisory function, *Refer to DSC-31-20 System Pages*.

L1 [MEM] MEMORY ITEMS

The [MEM] MEMORY ITEMS menu provides direct access to the list of memory items.

L2 For more information, *Refer to [MEM] Memory Items*.

L1 The content of the memory items are described in the applicable sub-sections of the abnormal and emergency procedures.
Memory items are procedures of an ECAM or QRH procedure that the flight crew must apply by memory to ensure a safe flight path. In some time-critical situations, the flight crew has no time to refer to the ECAM and/or to the QRH.

L2 For more information, *Refer to FCTM/AOP-10-40 Abnormal and Emergency Procedures*.

L1 [QRH] PROCEDURES

The [QRH] PROCEDURES menu provides direct access to the list of all the FCOM abnormal and emergency procedures that are also in the QRH.

L2 For more information, *Refer to [QRH] Procedures*.

L1 The content of the QRH procedures are described in the applicable sub-sections of the abnormal and emergency procedures.

Note: *Only the FCOM version of a procedure provides layer 2 and 3 information for consultation purpose.*

[RESET] SYSTEM RESET

The [RESET] SYSTEM RESET section provides direct access to the table listing all the system resets that are permitted, and the condition to apply them. The [RESET] section is also available in the QRH.

L2 For direct access to the table, *Refer to [RESET] System Reset*.

L1 SUB-SECTIONS OF ABNORMAL AND EMERGENCY PROCEDURES

This part of the FCOM describes the detailed content of all abnormal and emergency procedures. All procedures are grouped in sub-sections that can be system related (e.g. AIR, FUEL, etc.) or non-system related (e.g. MISC, T.O, CONFIG, etc.).
The sub-sections are sorted by alphabetic order.
For each sub-section, procedures are listed in the following order:

1. The memory items
   The title of the memory items starts with the [MEM] prefix
2. The abnormal and emergency procedures of the QRH
   The title of these procedures starts with the [QRH] prefix
3. The ECAM procedures.

PROCEDURE LAYOUT

Applicable to: ALL

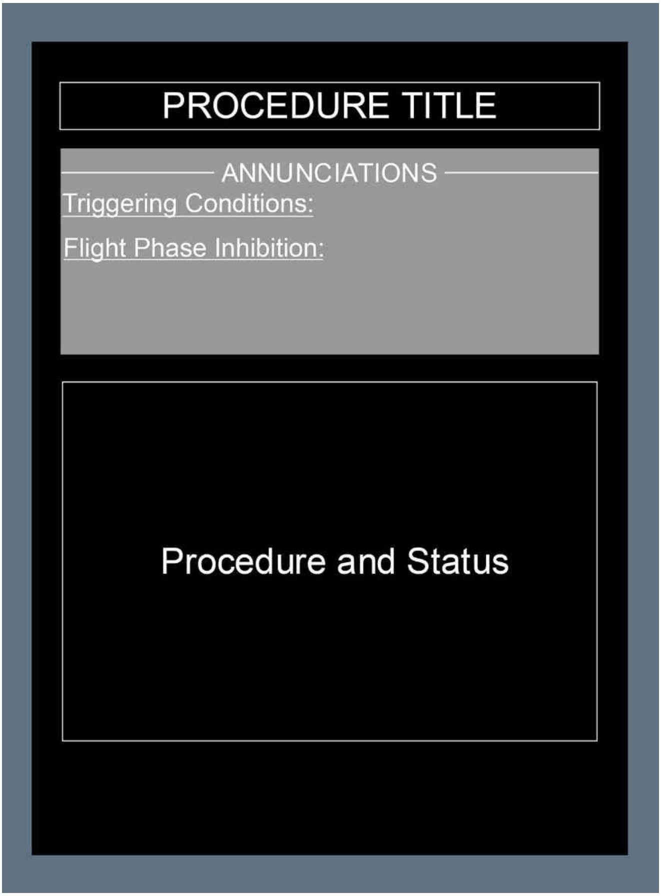
Ident.: PRO-ABN-ABN-00-A-00020763.0001001 / 17 MAR 17

GENERAL

The presentation of procedures is, as far as practicable, identical to the way it is displayed on the ECAM. The abbreviations are identical to those used on the cockpit panels.
All actions and information displayed on ECAM are provided in large letters. Other information, not on ECAM, is provided in small letters.
Expanded information is as far as practicable provided in layer 2. This information:

- Identifies the particular failures
- Explains actions for which the reason is not self-evident
- Provides some background on the reasons and /or the effects of a given action.

FCOM presentation of ABN or EMER procedures


PROCEDURE TITLE
ANNUNCIATIONS
Triggering Conditions:
Flight Phase Inhibition:
Procedure and Status

Ident.: PRO-ABN-ABN-00-A-00020772.0001001 / 17 MAR 17

PROCEDURE TITLE

The title of an abnormal or emergency procedure, displayed on the ECAM, appears on white background.
Abnormal procedure displayed on ECAM (amber caution) :

CAB PR SAFETY VALVE OPEN

Emergency procedure displayed on ECAM (red warning) :

🟥 CAB PR EXCESS CAB ALT 🟥

The title of an abnormal or emergency procedure, that does not appear on the ECAM, is on a grey background.
Abnormal procedure not displayed on ECAM :

[QRH] L/G GRAVITY EXTENSION

Emergency procedure not displayed on ECAM :

🟥 [QRH] DITCHING 🟥

SEVERAL ALERTS UNDER THE SAME TITLE

When applicable, several alerts may be grouped under the same procedure title.

Note: *Alerts that have the same procedure title may be differentiated by a subtitle (e.g. ENG FIRE (On Ground) versus ENG FIRE (In Flight))*

Ident.: PRO-ABN-ABN-00-A-00020773.0001001 / 17 MAR 17

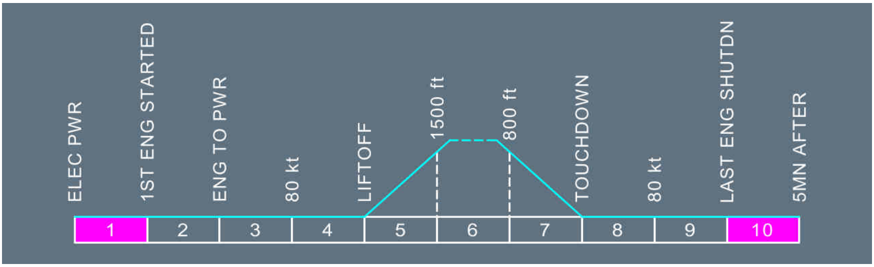
ANNUNCIATIONS

When applicable, the annunciations section provides:

- The triggering conditions, that describe the cause of the alert activation
- The flight phase inhibition.

FLIGHT PHASE INHIBITION

The Flight Phase Inhibition section indicates the flight phases during which the alert is inhibited. In the below example, the alert is inhibited in flight phase 1, and 10.



L2 For more information, Refer to DSC-31-15 ECAM Flight Phases.

Ident.: PRO-ABN-ABN-00-A-00020775.0001001 / 09 NOV 21

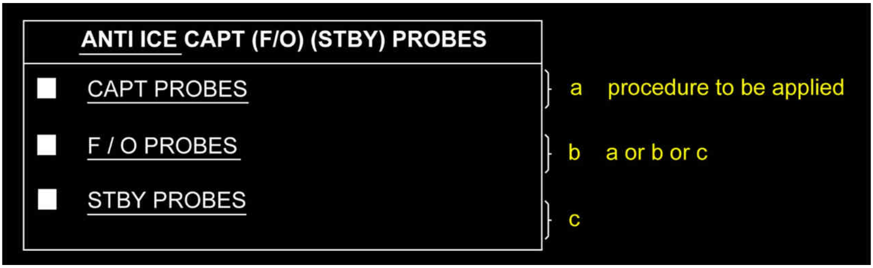
PROCEDURE AND STATUS

The Procedure and Status section provides the procedure and the Status (including approach procedure, limitations, inoperative systems, etc.), with additional information when relevant.

CONDITIONS

BLACK SQUARE

When several procedures appear under the same title, a black square marks the starting point of each procedure.
For example:



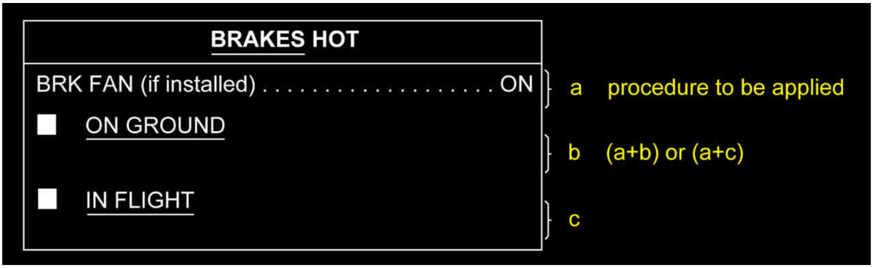
ANTI ICE CAPT (F/O) (STBY) PROBES

■ CAPT PROBES

■ F / O PROBES

■ STBY PROBES

Black squares also indicate parts of a procedure among which only one is applicable.
For example:



BRAKES HOT

BRK FAN (if installed) . . . . ON

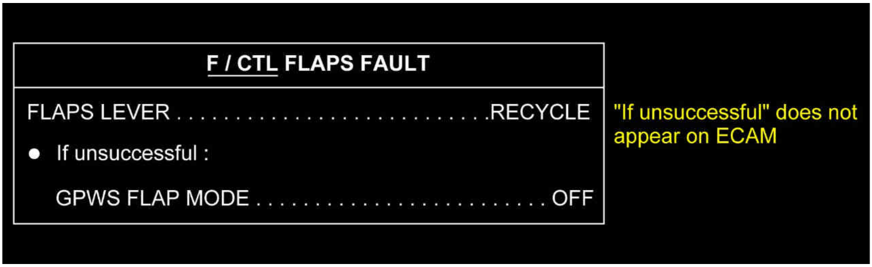
■ ON GROUND

■ IN FLIGHT

The ECAM does not display black squares.

BLACK DOT

If an action depends on a precondition, a black dot identifies the precondition. If the precondition appears on ECAM, it appears in LARGE LETTERS. If not, it appears in small letters.
For example:



F / CTL FLAPS FAULT

FLAPS LEVER . . . . .RECYCLE

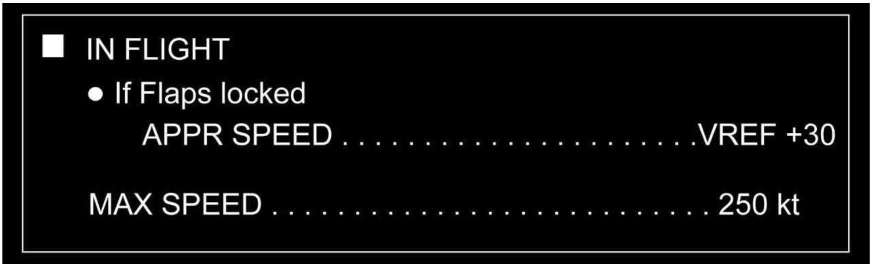
- If unsuccessful :

  GPWS FLAP MODE . . . . OFF

"If unsuccessful" does not appear on ECAM

INDENTATION

Indentation is used in order to identify when an action depends on a precondition/flight phase/procedure.
For example:



■ IN FLIGHT

- If Flaps locked

  APPR SPEED . . . . .VREF +30

MAX SPEED . . . . 250 kt

- The APPR SPEED is equal to VREF +30 kt only if the flaps are locked, because "APPR SPEED......VREF +30" is indented below "• If flaps locked".
- The MAX SPEED of 250 kt does not depend on the flaps locked condition because it is aligned with "• If Flaps locked". Therefore, MAX SPEED has to be respected whether the flaps are locked or not.

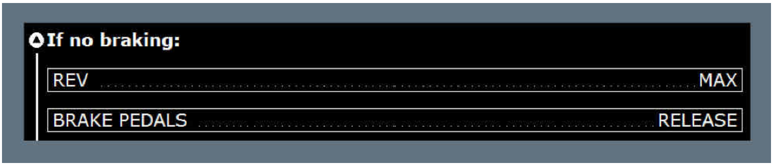
BOXED ITEMS

Items surrounded by a box enable the flight crew to easily identify them, as Memory items, OEB immediate actions or items introduced by “At ANY TIME of the procedure”.

MEMORY ITEMS

Memory items are items that the flight crew must memorize, in order to be able to rapidly apply them, without referring to the ECAM, and/or to the QRH.

Memory items



If no braking:

REV .... MAX

BRAKE PEDALS .... RELEASE

ABNORMAL AND EMERGENCY CALLOUTS

Applicable to: ALL

Ident.: PRO-ABN-ABN-00-B-00011839.0001001 / 23 DEC 14

ECAM PROCEDURES

1. "ECAM ACTION" is commanded by PF when required.
2. "CLEAR __ (title of the system) ?" is asked by the PM for confirmation by the PF, that all actions have been taken/reviewed on the present ECAM WARNING/CAUTION or SYSTEM PAGE. e.g.: "CLEAR HYDRAULIC ?" For the status; "REMOVE STATUS ?" will be used.
3. "CLEAR __ (title of the system)" is the command by the PF that the action and review is confirmed. For status page; "REMOVE STATUS" will be used.
4. "ECAM ACTIONS COMPLETE" is the announcement by the PM that all APPLICABLE ACTIONS have been completed.
5. Should the PF require an action from the PM during ECAM procedures, the order "STOP ECAM" will be used. When ready to resume the ECAM the order "CONTINUE ECAM" will be used.

Ident.: PRO-ABN-ABN-00-B-00019947.0001001 / 16 JAN 18

Some abnormal/emergency procedures require flight and cabin crews to use specific phraseology when communicating with each other. To ensure effective communication between the flight and cabin crews, the standard phraseology may be recalled at the preflight phase.

FROM	TO	PHRASEOLOGY	REMARKS
cockpit	cabin	Passenger Address (PA) System: "PURSER TO COCKPIT, PLEASE!"	The Purser, or any other cabin crewmember, must go to the cockpit
cockpit	cabin	Passenger Address (PA) System: "ATTENTION CREW! AT STATIONS!"	An emergency evacuation may soon be required
cockpit	cabin	Passenger Address (PA) System: "CABIN CREW and PASSENGERS REMAIN SEATED!"	The Captain decides that an evacuation is not required

Continued on the following page

Continued from the previous page

cockpit	cabin	Passenger Address (PA) System: "EVACUATE, EVACUATE"	The Captain orders an immediate evacuation
cabin	cockpit	Interphone: "PRIO CAPT"	Any cabin crewmember can make such a call. The flight crew must reply

Ident.: PRO-ABN-ABN-00-B-00011840.0001001 / 24 NOV 23

MEMORY ITEMS

The aim of the following callouts is to announce the appropriate procedure by calling out, in most cases, the title of the procedure. This allows the flight crew to be aware of the situation and be prepared to properly react (crew coordination, tasksharing and communication).

GPWS

As soon as avoidance maneuver is envisaged.
“PULL UP TOGA”

REACTIVE WINDSHEAR WARNING

”WINDSHEAR TOGA”

UNRELIABLE SPEED INDICATION

”UNRELIABLE SPEED”

TCAS

- **For aircraft equipped with AP/FD TCAS ◁ function:**

  As soon as a TA is triggered:
  - If the AP/FD TCAS mode is armed: "TCAS blue"
  - If the AP/FD TCAS mode does not arm: "TCAS, I have control"

- **For aircraft not equipped with AP/FD TCAS ◁ function:**

  As soon as a TA is triggered: "TCAS, I have control".

EMERGENCY DESCENT

”EMERGENCY DESCENT”

LOSS OF BRAKING

"LOSS OF BRAKING"

STALL RECOVERY

As soon as any stall indication is recognized:
"STALL, I have control"

STALL WARNING AT LIFT-OFF

"STALL, TOGA 15°"

MALFUNCTION BEFORE V1 AT TAKEOFF

EVENT	CAPT	F/O
If GO decision	GO	
If RTO decision	STOP	
- REV on EWD		REVERSE GREEN (1)
- Deceleration		DECEL (2)
- Autobrake disengagement	MANUAL BRAKING (3)	AUTOBRAKE OFF (4)

(1) *If the reverse deployment is not as expected, call "NO REVERSE ENGINE__" or "NO REVERSE", as appropriate.*

(2) *In the case of failure or no positive deceleration, call "NO DECEL".*

The "DECEL" callout means that the deceleration is felt by the flight crew and confirmed by:
- *The speed trend on the PFD, or*
- *The DECEL ◁ indication on the PFD, if the autobrake is active.*

The DECEL ◁ indication appears when the current deceleration reaches 80 % of the selected rate. However, the DECEL ◁ indication does not indicate the correct operation of the autobrake, but it only indicates that the selected deceleration rate is reached. For example, the DECEL ◁ indication may not appear on a contaminated runway, because of the anti-skid effect, even if the autobrake is active.

(3) *CAPT announces MANUAL BRAKING if:*
- *CAPT uses the brake pedals, and*
- *No AUTOBRAKE OFF callout from the F/O.*

(4) *F/O announces AUTOBRAKE OFF if:*
- *A/BRK does not engage as expected or A/BRK disengages, and*
- *No MANUAL BRAKING callout from the CAPT.*

ECAM ADVISORY CONDITIONS

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

SYST	CONDITIONS	RECOMMENDED ACTION

Ident.: PRO-ABN-ABN-ADV-A-00012270.0001001 / 17 MAR 17

APU	LOW OIL LEVEL	The APU may be started and operated for 15 h, if there is no oil leak.
	EGT high (inhibited during APU start)	

Ident.: PRO-ABN-ABN-ADV-A-00012267.0001001 / 05 MAR 19

CAB PR	CAB VERT SPD
	V/S >1 800 ft/min or V/S < -1 800 ft/min
		CPC changeover is recommended:
		- MODE SEL: MAN
		- Wait 3 s
		- MODE SEL: AUTO
		• If unsuccessful:
		  - MODE SEL: MAN
		  - Manual pressure control

	CAB ALT
	ALT ≥ 8 800 ft
		PACK FLOW: HI
		CPC changeover is recommended:
		- MODE SEL: MAN
		- Wait 3 s
		- MODE SEL: AUTO
		• If unsuccessful:
		  - MODE SEL: MAN
		  - Manual pressure control

	ΔP ≥ 1.5 PSI in phase 7	LDG ELEV: ADJUST
		• If unsuccessful:
		  - MODE SEL: MAN
		  - Manual pressure control

COND	PACK LO FLOW Pack flow not sufficient to satisfy temperature demand.	PACK FLOW: INCREASE

Ident.: PRO-ABN-ABN-ADV-A-00012268.0001001 / 17 MAR 17

ELEC	IDG OIL TEMP T > 151 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict use of the generator to a short time, if temperature rises again excessively.

Continued on the following page

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Ident.: PRO-ABN-ABN-ADV-A-00012272.0008001 / 04 NOV 20

SYST	CONDITIONS	RECOMMENDED ACTION
ENG	OIL TEMP 160 °C < T < 175 °C for 15 min	An increase in oil temperature, during normal steady-state operation, indicates a system malfunction and should be closely-monitored for other engine malfunction symptoms. An increase in oil temperature could be related to the IDG oil cooling system. To reduce the increase in oil temperature rise before limits are reached, the following are recommended: Reduce GEN load, or turn off GEN. If the oil temperature continues to rise, mechanically disconnect the IDG.
	OIL QTY < 2.5 Qts	The oil quantity in the tank can decrease at high thrust setting due to the effect of oil gulping. In that case, the indicated oil quantity will increase after thrust reduction. Monitor the affected engine oil parameters and crosscheck with the other engine - As long as the oil temperature and the oil pressure of the affected engine remain within limits, normal engine operation is not affected. If the oil quantity continues to decrease, the ECAM alert ENG 1(2) OIL LO PRcan be triggered (*Refer to PRO-ABN-ENG ENG 1(2) OIL LO PR - ANNUNCIATION*)
	NAC TEMP > 260 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 5.7 units N2 ≥ 5.6 units	(*Refer to PRO-ABN-ENG [QRH] HIGH ENGINE VIBRATION*)

Ident.: PRO-ABN-ABN-ADV-A-00012269.0002001 / 21 MAR 17

FUEL	The difference between L and R wing fuel quantities is greater than 3 000 kg (6 614 lb)	FUEL MANAGEMENT: CHECK If a fuel leak is suspected, *Refer to PRO-ABN-FUEL [QRH] FUEL LEAK* For limitations, *Refer to LIM-FUEL Maximum Allowed Fuel Imbalance*

Ident.: PRO-ABN-ABN-ADV-A-00012271.0010001 / 17 MAR 17

OXY	CKPT OXY Pulsing Green: When pressure is < 600 PSI Amber: When pressure is < 300 PSI	If mask is not being used check if it is correctly stowed, as per *Refer to DSC-35-20-10 Mask Stowage*
	PAX OXY ◁✻ 200 < pressure < 1 200 PSI	

ECAM ADVISORY CONDITIONS

Applicable to: LV-KHT, LV-KHU

Ident.: PRO-ABN-ABN-ADV-A-00012270.0001001 / 17 MAR 17

SYST	CONDITIONS	RECOMMENDED ACTION
APU	LOW OIL LEVEL	The APU may be started and operated for 15 h, if there is no oil leak.
	EGT high (inhibited during APU start)	

Ident.: PRO-ABN-ABN-ADV-A-00012267.0001001 / 05 MAR 19

SYST	CONDITIONS	RECOMMENDED ACTION
CAB PR	CAB VERT SPD V/S >1 800 ft/min or V/S < -1 800 ft/min	CPC changeover is recommended: - MODE SEL: MAN - Wait 3 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	CAB ALT ALT ≥ 8 800 ft	PACK FLOW: HI CPC changeover is recommended: - MODE SEL: MAN - Wait 3 s - MODE SEL: AUTO • If unsuccessful: - MODE SEL: MAN - Manual pressure control
	ΔP ≥ 1.5 PSI in phase 7	LDG ELEV: ADJUST • If unsuccessful: - MODE SEL: MAN - Manual pressure control
COND	PACK LO FLOW Pack flow not sufficient to satisfy temperature demand.	PACK FLOW: INCREASE

Ident.: PRO-ABN-ABN-ADV-A-00012268.0001001 / 17 MAR 17

SYST	CONDITIONS	RECOMMENDED ACTION
ELEC	IDG OIL TEMP T > 151 °C	Reduce IDG load, if possible (GALLEY or GEN OFF). If required, restore when the temperature has dropped. Restrict use of the generator to a short time, if temperature rises again excessively.

Continued on the following page

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SYST	CONDITIONS	RECOMMENDED ACTION

Ident.: PRO-ABN-ABN-ADV-A-00012272.0004001 / 04 NOV 20

ENG	OIL QTY < 4 US Qts	The oil quantity in the tank can decrease at high thrust setting due to the effect of oil gulping. In that case, the indicated oil quantity will increase after thrust reduction. Monitor the affected engine oil parameters and crosscheck with the other engine - As long as the oil temperature and the oil pressure of the affected engine remain within limits, normal engine operation is not affected. If the oil quantity continues to decrease, the ECAM alert ENG 1(2) OIL LO PR can be triggered (*Refer to PRO-ABN-ENG ENG 1(2) OIL LO PR - ANNUNCIATION*)
	NAC TEMP > 260 °C	Monitor engine parameters and crosscheck with other engine.
	VIBRATION N1 ≥ 3.3 units N2 ≥ 2.6 units N3 ≥ 4.0 units	(*Refer to PRO-ABN-ENG [QRH] HIGH ENGINE VIBRATION*)

Ident.: PRO-ABN-ABN-ADV-A-00012269.0002001 / 21 MAR 17

FUEL	The difference between L and R wing fuel quantities is greater than 3 000 kg (6 614 lb)	FUEL MANAGEMENT: CHECK If a fuel leak is suspected, *Refer to PRO-ABN-FUEL [QRH] FUEL LEAK* For limitations, *Refer to LIM-FUEL Maximum Allowed Fuel Imbalance*

Ident.: PRO-ABN-ABN-ADV-A-00012271.0010001 / 17 MAR 17

OXY	CKPT OXY Pulsing Green: When pressure is < 600 PSI Amber: When pressure is < 300 PSI	If mask is not being used check if it is correctly stowed, as per *Refer to DSC-35-20-10 Mask Stowage*
	PAX OXY ◁ 200 < pressure < 1 200 PSI	

[MEM] MEMORY ITEMS

Applicable to: ALL

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020812.0001001 / 17 MAR 17

BRAKES

[MEM] LOSS OF BRAKING (*Refer to procedure*)

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020813.0001001 / 17 MAR 17

MISC

[MEM] EMER DESCENT (*Refer to procedure*)
[MEM] STALL RECOVERY (*Refer to procedure*)
[MEM] STALL WARNING AT LIFT OFF (*Refer to procedure*)

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020814.0001001 / 01 JUN 17

NAV

[MEM] UNRELIABLE SPEED INDICATION (*Refer to procedure*)

Ident.: PRO-ABN-ABN-MEM-ABN-MEM-00020815.0002001 / 13 MAY 22

SURV

[MEM] EGPWS CAUTION (*Refer to procedure*)
[MEM] EGPWS WARNING (*Refer to procedure*)
[MEM] TCAS CAUTION - TRAFFIC ADVISORY (*Refer to procedure*)
[MEM] TCAS WARNING - RESOLUTION ADVISORY (*Refer to procedure*)
[MEM] WINDSHEAR WARNING - REACTIVE WINDSHEAR (*Refer to procedure*)

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[QRH] PROCEDURES

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020846.0001001 / 17 MAR 17
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

A-ICE

[QRH] DOUBLE AOA HEAT FAILURE (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020847.0003001 / 17 MAR 17
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

AIR

[QRH] BLEED 1+2 RESET (APU BLEED ON) (*Refer to procedure*)
[QRH] BLEED 1+2 RESET (APU BLEED NOT AVAILABLE) (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020847.0004001 / 27 FEB 18
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

AIR

[QRH] BLEED 1+2 FAULT (APU BLEED ON) (*Refer to procedure*)
[QRH] BLEED 1+2 FAULT (APU BLEED NOT AVAILABLE) (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020851.0001001 / 17 MAR 17
Applicable to: ALL

DOOR

[QRH] COCKPIT DOOR FAULT (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020853.0001001 / 17 MAR 17
Applicable to: ALL

EIS

[QRH] DISPLAY UNIT FAILURE (*Refer to procedure*)
[QRH] EIS DISPLAY DISCREPANCY (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020844.0001001 / 17 MAY 21
Applicable to: ALL

ELEC

[QRH] C/B TRIPPED (*Refer to procedure*)
[QRH] ELEC EMER CONFIG SYS-REMAINING (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020868.0008001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

ENG

[QRH] ALL ENG FAIL (*Refer to procedure*)
[QRH] ENGINE FUEL SYS CONTAMINATION (*Refer to procedure*)
[QRH] ENG RELIGHT IN FLIGHT (*Refer to procedure*)
[QRH] ENG STALL (*Refer to procedure*)
[QRH] ENGINE TAILPIPE FIRE (*Refer to procedure*)
[QRH] HIGH ENGINE VIBRATION (*Refer to procedure*)
[QRH] ON GROUND - NON ENG SHUTDOWN AFTER ENG MASTER OFF (*Refer to procedure*)
[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020868.0010001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ENG

[QRH] ALL ENG FAIL (*Refer to procedure*)
[QRH] ENGINE FUEL SYS CONTAMINATION (*Refer to procedure*)
[QRH] ENG RELIGHT IN FLIGHT (*Refer to procedure*)
[QRH] ENG STALL (*Refer to procedure*)
[QRH] ENGINE TAILPIPE FIRE (*Refer to procedure*)
[QRH] HIGH ENGINE VIBRATION (*Refer to procedure*)
[QRH] ON GROUND - NON ENG SHUTDOWN AFTER ENG MASTER OFF (*Refer to procedure*)
[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020870.0003001 / 03 DEC 20
Applicable to: ALL

F/CTL

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (*Refer to procedure*)
[QRH] NO FLAPS NO SLATS LANDING (*Refer to procedure*)
[QRH] RUDDER JAM / RUDDER PEDAL JAM (*Refer to procedure*)
[QRH] RUDDER TRIM RUNAWAY (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020842.0004001 / 08 NOV 21
Applicable to: LV-KAN, LV-KAO

FUEL

[QRH] FUEL IMBALANCE (*Refer to procedure*)
[QRH] FUEL JETTISON (*Refer to procedure*)
[QRH] FUEL LEAK (*Refer to procedure*)
[QRH] FUEL LOSS REDUCTION (*Refer to procedure*)
[QRH] FUEL OVERREAD (*Refer to procedure*)
[QRH] GRAVITY FUEL FEEDING (*Refer to procedure*)
[QRH] TRIM TANK FUEL UNUSABLE (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020842.0001001 / 16 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

FUEL

[QRH] FUEL IMBALANCE (*Refer to procedure*)
[QRH] FUEL LEAK (*Refer to procedure*)
[QRH] FUEL LOSS REDUCTION (*Refer to procedure*)
[QRH] FUEL OVERREAD (*Refer to procedure*)
[QRH] GRAVITY FUEL FEEDING (*Refer to procedure*)
[QRH] TRIM TANK FUEL UNUSABLE (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020854.0001001 / 17 MAR 17
Applicable to: ALL

L/G

[QRH] LANDING WITH ABNORMAL L/G (*Refer to procedure*)
[QRH] L/G GRAVITY EXTENSION (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00022274.0005001 / 17 NOV 20
Applicable to: ALL

MISC

[QRH] BOMB ON BOARD (*Refer to procedure*)
[QRH] COCKPIT WINDSHIELD / WINDOW ARCING (*Refer to procedure*)
[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED (*Refer to procedure*)
[QRH] DITCHING (*Refer to procedure*)
[QRH] EMER EVAC (*Refer to procedure*)
[QRH] EMER LANDING (*Refer to procedure*)
[QRH] FORCED LANDING (*Refer to procedure*)
[QRH] OVERWEIGHT LANDING (*Refer to procedure*)
[QRH] SEVERE TURBULENCE (*Refer to procedure*)
[QRH] TAILSTRIKE (*Refer to procedure*)
[QRH] VOLCANIC ASH ENCOUNTER (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020874.0002001 / 05 MAY 22
Applicable to: ALL

NAV

[QRH] ABNORMAL V ALPHA PROT (*Refer to procedure*)
[QRH] UNREL SPD INDICATION (*Refer to procedure*)
[QRH] ALL ADR OFF (*Refer to procedure*)
[QRH] IR ALIGNMENT IN ATT MODE (*Refer to procedure*)
[QRH] NAV FM / GPS POS DISAGREE (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020839.0001001 / 12 FEB 19
Applicable to: ALL

SMOKE

[QRH] SMOKE / FUMES / AVNCS SMOKE (*Refer to procedure*)
[QRH] REMOVAL OF SMOKE / FUMES (*Refer to procedure*)
[QRH] SMOKE / FIRE FROM LITHIUM BATTERY (*Refer to procedure*)

Ident.: PRO-ABN-ABN-QRH-ABN-QRH-00020871.0001001 / 17 MAR 17
Applicable to: ALL

WHEEL

[QRH] WHEEL TIRE DAMAGE SUSPECTED (*Refer to procedure*)

SYSTEM RESET - GENERAL

Applicable to: ALL

Ident.: PRO-ABN-ABN-RST-A-00012106.0001001 / 04 MAY 23

To recover a system that operates abnormally, the flight crew can perform an authorized system reset with the use of:

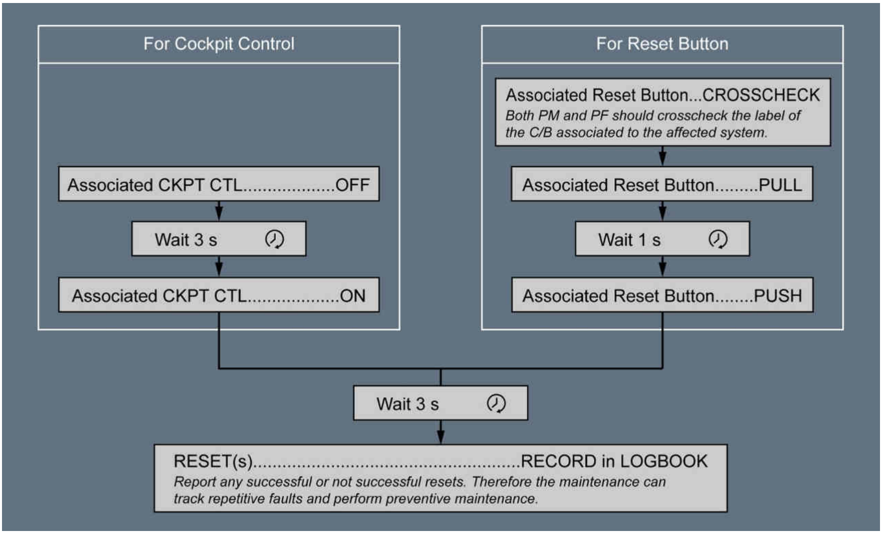
- The associated cockpit control (CKPT CTL),
- The associated reset button.

- **To know if a system reset is authorized, the flight crew applies the following guidelines:**

<table>
<tr><th>On Ground</th><th>or</th><th colspan="2">In Flight</th></tr>
<tr><td colspan="3">• If ECAM/OEB/QRH procedure requests a reset,
or
• If the system malfunction is listed and authorized in the system reset table.</td><td>Reset authorized</td></tr>
</table>

WARNING In all other cases: RESET NOT AUTHORIZED.

- **To perform a reset, unless there is a specific reset procedure defined in the ECAM/FCOM/QRH or in the system reset table, the flight crew applies the following standard reset procedure:**



For Cockpit Control

Associated CKPT CTL..................OFF

Wait 3 s

Associated CKPT CTL..................ON

For Reset Button

Associated Reset Button...CROSSCHECK

Both PM and PF should crosscheck the label of the C/B associated to the affected system.

Associated Reset Button.........PULL

Wait 1 s

Associated Reset Button........PUSH

Wait 3 s

RESET(s)...RECORD in LOGBOOK

Report any successful or not successful resets. Therefore the maintenance can track repetitive faults and perform preventive maintenance.

WARNING	Only perform one reset at a time, unless indicated differently in the applicable reset procedure of the table.

Note: *Manual reset on ground triggers complete power up test.*

SYSTEM RESET TABLE

Applicable to: LV-GKO

Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note:* *Associated heating is interrupted, when the reset pb is pulled.*

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Ident.: PRO-ABN-ABN-RST-B-00014541.0005001 / 04 NOV 20

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
AIR	ENG BLEED		AIR panel	ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert *Note: Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A: AIR ENG 1(2) BLEED FAULT alert:** **CAUTION** If the BLEED NOT CLOSED subtitle is displayed, do not reset the affected ENG BLEED. On ground or in flight • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)................................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED...AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side)..................................ON - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If AIR ENG (AFFECTED) BLEED FAULT alert reoccurs, or If Engine Bleed Valve (affected side) not open on the BLEED SD page:** - ENG BLEED (affected side)..............OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- X BLEED.......................................OPEN *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER sw	Reset must only be attempted when APU speed is below 7 %.

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Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s))......................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. *Note:* *Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. • **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]...........................PULL WAIT 1 s FMGEC1 reset button [261VU]...........................PUSH WAIT END OF RESET • **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* • **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]...........................PULL WAIT 1 s FMGEC2 reset button [262VU]...........................PUSH WAIT END OF RESET • **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF • **If FMGEC1 affected:**

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	**System Control Panel**	
				FMGEC1 reset button [261VU].....................................PULL WAIT 1 s FMGEC1 reset button [261VU].....................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU].....................................PULL WAIT 1 s FMGEC2 reset button [262VU].....................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. *Note: Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20				
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Set A/SKID & N/W STRG sw to ON. *Note:* *After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC..................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb............MAN - WAIT 3 s - MODE SEL pb............AUTO - FAULTY CPC..................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

1 Ident.: PRO-ABN-ABN-RST-B-00016078.0004001 / 18 DEC 23

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). *Note:* *After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* - *SMOKE LAVATORY DET FAULT* - *SMOKE VIDEO 1(2)(3)(4) DET FAULT* ◁ .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM ◁		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Set the ELT sw to the TEST/RESET position (or RESET/TEST, depending on aircraft configuration) - Wait 3 s - Set the ELT sw to the ARMED position.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

DATALINK	ATSU	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS, DCL, OCL, or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. *Note: As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. *Note: An AINS reset may take up to 20 min.*
	CINS	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. *Note: The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

DOOR	PSCU	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note: On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17

ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.

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Ident.: PRO-ABN-ABN-RST-B-00012491.0003001 / 26 NOV 19

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. Note: *Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. Note: *When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.
	SFCC FLAPS 1(2)	2		**On ground only** Only in case of F/CTL FLAP SYS 1(2) FAULT alerts: - Pull FLAPS 1 (261VU) or FLAPS 2 (262VU) reset button - Wait 5 s - Push FLAPS 1 or FLAPS 2 reset button. **WARNING** - Do not perform any reset of the flaps control unit during flaps movement, and - Do not reset more than one SFCC channel at the same time.
	SFCC SLATS 1(2)	2		**On ground only** Only in case of F/CTL SLAT SYS 1(2) FAULTalerts: - Pull SLATS 1 (261VU) or SLATS 2 (262VU) reset button - Wait 5 s - Push SLATS 1 or SLATS 2 reset button. **WARNING** - Do not perform any reset of the slats control unit during slats movement, and - Do not reset more than one SFCC channel at the same time.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012492.0003001 / 20 MAR 17

FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the MCDU INIT B page, - If the reset is done after engine start, the actual GW and CG displayed on the MCDU FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the MCDU FUEL PRED page, • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM caution is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

FWS	FWC SDAC	2		Apply standard reset procedure.

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ECAM System	Affected System	MANUAL RESET OVHD RESET Panel	 System Control Panel	Reset Procedure
Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19				
L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. *Note:* *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18				
MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012490.0001001 / 20 MAR 17

SMOKE	SDCU	2		Only a simultaneous reset of SDCU 1 and SDCU 2 is authorized. **On ground** - Simultaneously pull both SDCU 1 reset pb and SDCU 2 reset pb - Wait 2 min - Simultaneously push both SDCU 1 reset pb and SDCU 2 reset pb - Wait 3 min for the system restart to be completed. **In flight** - Simultaneously pull both SDCU 1 reset pb and SDCU 2 reset pb - Wait 3 s - Simultaneously push both SDCU 1 reset pb and SDCU 2 reset pb - Wait 15 s for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0001001 / 20 MAR 17

VENT	VENT CONT	2		Apply standard reset procedure.
	AEVC	1		

SYSTEM RESET TABLE

Applicable to: LV-GKP

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22				
A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note:* *Associated heating is interrupted, when the reset pb is pulled.*

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00014541.0005001 / 04 NOV 20

AIR	ENG BLEED		AIR panel	ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert *Note: Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A: AIR ENG 1(2) BLEED FAULT alert:** **CAUTION** If the BLEED NOT CLOSED subtitle is displayed, do not reset the affected ENG BLEED. On ground or in flight • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)................................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED...AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side)..................................ON - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If AIR ENG (AFFECTED) BLEED FAULT alert reoccurs, or If Engine Bleed Valve (affected side) not open on the BLEED SD page:** - ENG BLEED (affected side)..............OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- X BLEED.......................................OPEN *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)..............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER SW	Reset must only be attempted when APU speed is below 7 %.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22				
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s))......................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. Note: *Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	**System Control Panel**	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. - **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]............................PULL WAIT 1 s FMGEC1 reset button [261VU]............................PUSH WAIT END OF RESET - **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. Note: *The FMGEC reset is more effective when engines are not running.* - **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]............................PULL WAIT 1 s FMGEC2 reset button [262VU]............................PUSH WAIT END OF RESET - **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. Note: *The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF - **If FMGEC1 affected:**

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				FMGEC1 reset button [261VU]......................................PULL WAIT 1 s FMGEC1 reset button [261VU]......................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU]......................................PULL WAIT 1 s FMGEC2 reset button [262VU]......................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. *Note: Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20				
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Set A/SKID & N/W STRG sw to ON. *Note:* *After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC..................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb.............MAN - WAIT 3 s - MODE SEL pb.............AUTO - FAULTY CPC..................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

2 Ident.: PRO-ABN-ABN-RST-B-00016078.0004001 / 18 DEC 23

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). Note: *After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* - *SMOKE LAVATORY DET FAULT* - *SMOKE VIDEO 1(2)(3)(4) DET FAULT* .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Set the ELT sw to the TEST/RESET position (or RESET/TEST, depending on aircraft configuration) - Wait 3 s - Set the ELT sw to the ARMED position.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

DATALINK	ATSU	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS, DCL, OCL, or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. *Note: As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. *Note: An AINS reset may take up to 20 min.*
	CINS	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. *Note: The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

DOOR	PSCU	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note: On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17

ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.

Ident.: PRO-ABN-ABN-RST-B-00012491.0002001 / 26 NOV 19

F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. *Note: Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. *Note: When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012492.0003001 / 20 MAR 17

ECAM System	Affected System	OVHD RESET Panel	System Control Panel	Reset Procedure
FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the MCDU INIT B page, - If the reset is done after engine start, the actual GW and CG displayed on the MCDU FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the MCDU FUEL PRED page, • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM caution is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

ECAM System	Affected System	OVHD RESET Panel	System Control Panel	Reset Procedure
FWS	FWC SDAC	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19				
L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. *Note:* *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18				
MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012490.0001001 / 20 MAR 17

SMOKE	SDCU	2		Only a simultaneous reset of SDCU 1 and SDCU 2 is authorized. **On ground** - Simultaneously pull both SDCU 1 reset pb and SDCU 2 reset pb - Wait 2 min - Simultaneously push both SDCU 1 reset pb and SDCU 2 reset pb - Wait 3 min for the system restart to be completed. **In flight** - Simultaneously pull both SDCU 1 reset pb and SDCU 2 reset pb - Wait 3 s - Simultaneously push both SDCU 1 reset pb and SDCU 2 reset pb - Wait 15 s for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0001001 / 20 MAR 17

VENT	VENT CONT	2		Apply standard reset procedure.
	AEVC	1		

SYSTEM RESET TABLE

Applicable to: LV-KAN, LV-KAO

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22

A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note:* *Associated heating is interrupted, when the reset pb is pulled.*

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Ident.: PRO-ABN-ABN-RST-B-00014541.0004001 / 05 JUN 18

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
AIR	ENG BLEED		AIR panel	**CAUTION** If the AIR ENG 1+2 BLEED FAULT alert requests to apply the "BLEED 1+2 RST PROC", refer to FCOM-QRH ABN-AIR-BLEED 1+2 RESET. ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert Note: *Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A:** AIR ENG 1(2) BLEED FAULT **alert:** **On ground or in flight** • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED...AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side).................................ON - ENG BLEED (affected side).......................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If** AIR ENG (AFFECTED) BLEED FAULT **alert reoccurs, or If Engine Bleed Valve (affected side) not open on the** BLEED SD page**:** - ENG BLEED (affected side).............OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- X BLEED.......................................OPEN *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side).........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER sw	Reset must only be attempted when APU speed is below 7 %.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22				
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s)).....................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. *Note:* *Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. - **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]..........................PULL WAIT 1 s FMGEC1 reset button [261VU]..........................PUSH WAIT END OF RESET - **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. *Note: The FMGEC reset is more effective when engines are not running.* - **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]..........................PULL WAIT 1 s FMGEC2 reset button [262VU]..........................PUSH WAIT END OF RESET - **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. *Note: The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF - **If FMGEC1 affected:**

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				FMGEC1 reset button [261VU]......................................PULL WAIT 1 s FMGEC1 reset button [261VU]......................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU]......................................PULL WAIT 1 s FMGEC2 reset button [262VU]......................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. *Note:* *Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Set A/SKID & N/W STRG sw to ON. *Note:* *After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC...................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb.............MAN - WAIT 3 s - MODE SEL pb.............AUTO - FAULTY CPC..................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

3 Ident.: PRO-ABN-ABN-RST-B-00016078.0004001 / 18 DEC 23

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). *Note: After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* *- SMOKE LAVATORY DET FAULT* *- SMOKE VIDEO 1(2)(3)(4) DET FAULT* .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Set the ELT sw to the TEST/RESET position (or RESET/TEST, depending on aircraft configuration) - Wait 3 s - Set the ELT sw to the ARMED position.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

DATALINK	ATSU ◁✻	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS ◁✻ , DCL ◁✻ , OCL ◁✻ , or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. Note: *As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS ◁✻	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. Note: *An AINS reset may take up to 20 min.*
	CINS ◁✻	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. Note: *The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

DOOR	PSCU	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note: On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17

ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.

Ident.: PRO-ABN-ABN-RST-B-00012491.0002001 / 26 NOV 19

F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. *Note:* *Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. *Note:* *When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.

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Ident.: PRO-ABN-ABN-RST-B-00012492.0005001 / 03 NOV 21

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the INIT FUEL PRED page. - If the reset is done after engine start, the actual GW and CG displayed on the FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the FUEL PRED page • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM alert is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

FWS	FWC SDAC	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19				
L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. Note: *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18				
MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012490.0001001 / 20 MAR 17

SMOKE	SDCU	2		Only a simultaneous reset of SDCU 1 and SDCU 2 is authorized. **On ground** - Simultaneously pull both SDCU 1 reset pb and SDCU 2 reset pb - Wait 2 min - Simultaneously push both SDCU 1 reset pb and SDCU 2 reset pb - Wait 3 min for the system restart to be completed. **In flight** - Simultaneously pull both SDCU 1 reset pb and SDCU 2 reset pb - Wait 3 s - Simultaneously push both SDCU 1 reset pb and SDCU 2 reset pb - Wait 15 s for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0004001 / 20 MAR 17

VENT	VENT CONT	2		If, in flight, the SMOKE CAB REST SMOKEwarning has been temporarily displayed and identified as a false warning, crew rest compartment ventilation may be recovered by resetting both VENT controller channels (simultaneously pull both ventilation controller RESET pb for at least 5 s, then push them).
	AEVC	1		Apply standard reset procedure.

SYSTEM RESET TABLE

Applicable to: LV-KHT

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22

A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note:* *Associated heating is interrupted, when the reset pb is pulled.*

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Ident.: PRO-ABN-ABN-RST-B-00014541.0005001 / 04 NOV 20

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
AIR	ENG BLEED		AIR panel	ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert *Note: Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A: AIR ENG 1(2) BLEED FAULT alert:** **CAUTION** If the BLEED NOT CLOSED subtitle is displayed, do not reset the affected ENG BLEED. **On ground or in flight** • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)................................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED...AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side)..................................ON - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If AIR ENG (AFFECTED) BLEED FAULT alert reoccurs, or If Engine Bleed Valve (affected side) not open on the BLEED SD page:** - ENG BLEED (affected side)..............OFF

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				- X BLEED.......................................OPEN *Note:* *Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note:* *Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER sw	Reset must only be attempted when APU speed is below 7 %.

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Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s))......................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. *Note:* *Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. - **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]..........................PULL WAIT 1 s FMGEC1 reset button [261VU]..........................PUSH WAIT END OF RESET - **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* - **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]..........................PULL WAIT 1 s FMGEC2 reset button [262VU]..........................PUSH WAIT END OF RESET - **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF - **If FMGEC1 affected:**

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				FMGEC1 reset button [261VU].....................................PULL WAIT 1 s FMGEC1 reset button [261VU].....................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU].....................................PULL WAIT 1 s FMGEC2 reset button [262VU].....................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. Note: *Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20				
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Set A/SKID & N/W STRG sw to ON. *Note: After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC...................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb.............MAN - WAIT 3 s - MODE SEL pb.............AUTO - FAULTY CPC..................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

4 Ident.: PRO-ABN-ABN-RST-B-00016078.0006001 / 18 DEC 23

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). *Note:* *After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* - *SMOKE LAVATORY DET FAULT* - *SMOKE VIDEO 1(2)(3)(4) DET FAULT* ◁ .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM ◁		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Push the ELT TEST/RESET pb.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

DATALINK	ATSU ✳	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS ✳ , DCL ✳ , OCL ✳ , or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. *Note: As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS ✳	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. *Note: An AINS reset may take up to 20 min.*
	CINS ✳	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. *Note: The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

DOOR	PSCU	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note: On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17				
ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.
Ident.: PRO-ABN-ABN-RST-B-00012491.0002001 / 26 NOV 19				
F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. *Note: Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. *Note: When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012492.0003001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the MCDU INIT B page, - If the reset is done after engine start, the actual GW and CG displayed on the MCDU FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the MCDU FUEL PRED page, • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM caution is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
FWS	FWC SDAC	2		Apply standard reset procedure.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19				
L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. *Note:* *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18

MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012490.0002001 / 20 MAR 17

SMOKE	Smoke detection function of the CIDS-SDF	2		**On ground** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 10 s - Push both SDF 1 and SDF 2 reset buttons. - Wait 3 min for the system restart to be completed. **In flight** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 3 s - Push both SDF 1 and SDF 2 reset buttons - Wait 1 min for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0004001 / 20 MAR 17

VENT	VENT CONT	2		If, in flight, the SMOKE CAB REST SMOKEwarning has been temporarily displayed and identified as a false warning, crew rest compartment ventilation may be recovered by resetting both VENT controller channels (simultaneously pull both ventilation controller RESET pb for at least 5 s, then push them).
	AEVC	1		Apply standard reset procedure.

SYSTEM RESET TABLE

Applicable to: LV-KHU

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22

A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note:* *Associated heating is interrupted, when the reset pb is pulled.*

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00014541.0004001 / 05 JUN 18				
AIR	ENG BLEED		AIR panel	**CAUTION** If the AIR ENG 1+2 BLEED FAULT alert requests to apply the "BLEED 1+2 RST PROC", refer to FCOM-QRH ABN-AIR-BLEED 1+2 RESET. ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert *Note: Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A: AIR ENG 1(2) BLEED FAULT alert:** **On ground or in flight** • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED...AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side).................................ON - ENG BLEED (affected side).......................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If AIR ENG (AFFECTED) BLEED FAULT alert reoccurs, or If Engine Bleed Valve (affected side) not open on the BLEED SD page:** - ENG BLEED (affected side).............OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- X BLEED......................................OPEN *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)..............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER sw	Reset must only be attempted when APU speed is below 7 %.

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Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s))......................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. *Note: Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. - **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]..........................PULL WAIT 1 s FMGEC1 reset button [261VU]..........................PUSH WAIT END OF RESET - **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* - **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]..........................PULL WAIT 1 s FMGEC2 reset button [262VU]..........................PUSH WAIT END OF RESET - **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF - **If FMGEC1 affected:**

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				FMGEC1 reset button [261VU]......................................PULL WAIT 1 s FMGEC1 reset button [261VU]......................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU]......................................PULL WAIT 1 s FMGEC2 reset button [262VU]......................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. *Note:* *Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20				
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Set A/SKID & N/W STRG sw to ON. *Note:* *After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC...................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb.............MAN - WAIT 3 s - MODE SEL pb.............AUTO - FAULTY CPC..................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

5 Ident.: PRO-ABN-ABN-RST-B-00016078.0006001 / 18 DEC 23

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). *Note:* *After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* - *SMOKE LAVATORY DET FAULT* - *SMOKE VIDEO 1(2)(3)(4) DET FAULT* ◁ .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM ◁		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Push the ELT TEST/RESET pb.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

DATALINK	ATSU ⊲	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS ⊲ , DCL ⊲ , OCL ⊲ , or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. *Note:* *As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS ⊲	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. *Note:* *An AINS reset may take up to 20 min.*
	CINS ⊲	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. *Note:* *The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

DOOR	PSCU	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note:* *On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17

ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.

Ident.: PRO-ABN-ABN-RST-B-00012491.0002001 / 26 NOV 19

F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. *Note:* *Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. *Note:* *When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012492.0003001 / 20 MAR 17

FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the MCDU INIT B page, - If the reset is done after engine start, the actual GW and CG displayed on the MCDU FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the MCDU FUEL PRED page, • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM caution is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

FWS	FWC SDAC	2		Apply standard reset procedure.

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Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. Note: *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18

MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012490.0002001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
SMOKE	Smoke detection function of the CIDS-SDF	2		**On ground** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 10 s - Push both SDF 1 and SDF 2 reset buttons. - Wait 3 min for the system restart to be completed. **In flight** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 3 s - Push both SDF 1 and SDF 2 reset buttons - Wait 1 min for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0004001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
VENT	VENT CONT	2		If, in flight, the SMOKE CAB REST SMOKEwarning has been temporarily displayed and identified as a false warning, crew rest compartment ventilation may be recovered by resetting both VENT controller channels (simultaneously pull both ventilation controller RESET pb for at least 5 s, then push them).
	AEVC	1		Apply standard reset procedure.

SYSTEM RESET TABLE

Applicable to: LV-FVH, LV-GHQ, LV-GIF

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22

A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note:* *Associated heating is interrupted, when the reset pb is pulled.*

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00014541.0005001 / 04 NOV 20				
AIR	ENG BLEED		AIR panel	ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert *Note: Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A: AIR ENG 1(2) BLEED FAULT alert:** **CAUTION** If the BLEED NOT CLOSED subtitle is displayed, do not reset the affected ENG BLEED. **On ground or in flight** • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED..AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side).................................ON - ENG BLEED (affected side).......................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If AIR ENG (AFFECTED) BLEED FAULT alert reoccurs, or If Engine Bleed Valve (affected side) not open on the BLEED SD page:** - ENG BLEED (affected side)..............OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- X BLEED.......................................OPEN *Note:* *Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)..............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note:* *Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER sw	Reset must only be attempted when APU speed is below 7 %.

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Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s))......................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. *Note:* *Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. - **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]...........................PULL WAIT 1 s FMGEC1 reset button [261VU]...........................PUSH WAIT END OF RESET - **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* - **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]...........................PULL WAIT 1 s FMGEC2 reset button [262VU]...........................PUSH WAIT END OF RESET - **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. *Note:* *The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF - **If FMGEC1 affected:**

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				FMGEC1 reset button [261VU]......................................PULL WAIT 1 s FMGEC1 reset button [261VU]......................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU]......................................PULL WAIT 1 s FMGEC2 reset button [262VU]......................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. *Note:* *Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET** **OVHD RESET Panel**	 **System Control Panel**	**Reset Procedure**
				- Set A/SKID & N/W STRG sw to ON. Note: *After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC...................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb.............MAN - WAIT 3 s - MODE SEL pb.............AUTO - FAULTY CPC..................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

6 Ident.: PRO-ABN-ABN-RST-B-00016078.0006001 / 18 DEC 23

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	**System Control Panel**	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). *Note:* *After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* - *SMOKE LAVATORY DET FAULT* - *SMOKE VIDEO 1(2)(3)(4) DET FAULT* .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Push the ELT TEST/RESET pb.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
DATALINK	ATSU	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS, DCL, OCL, or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. *Note:* *As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. *Note:* *An AINS reset may take up to 20 min.*
	CINS	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. *Note:* *The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
DOOR	PSCU	2		Apply standard reset procedure.

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Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

ECAM System	Affected System	MANUAL RESET OVHD RESET Panel	 System Control Panel	Reset Procedure
EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note:* *On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ECAM System	Affected System	MANUAL RESET OVHD RESET Panel	 System Control Panel	Reset Procedure
ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17

ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.

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Ident.: PRO-ABN-ABN-RST-B-00012491.0003001 / 26 NOV 19

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. *Note: Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. *Note: When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.
	SFCC FLAPS 1(2)	2		**On ground only** Only in case of F/CTL FLAP SYS 1(2) FAULT alerts: - Pull FLAPS 1 (261VU) or FLAPS 2 (262VU) reset button - Wait 5 s - Push FLAPS 1 or FLAPS 2 reset button. **WARNING** - Do not perform any reset of the flaps control unit during flaps movement, and - Do not reset more than one SFCC channel at the same time.
	SFCC SLATS 1(2)	2		**On ground only** Only in case of F/CTL SLAT SYS 1(2) FAULTalerts: - Pull SLATS 1 (261VU) or SLATS 2 (262VU) reset button - Wait 5 s - Push SLATS 1 or SLATS 2 reset button. **WARNING** - Do not perform any reset of the slats control unit during slats movement, and - Do not reset more than one SFCC channel at the same time.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012492.0005001 / 03 NOV 21

ECAM System	Affected System	OVHD RESET Panel	System Control Panel	Reset Procedure
FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the INIT FUEL PRED page. - If the reset is done after engine start, the actual GW and CG displayed on the FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the FUEL PRED page • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM alert is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

ECAM System	Affected System	OVHD RESET Panel	System Control Panel	Reset Procedure
FWS	FWC SDAC	2		Apply standard reset procedure.

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Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. *Note:* *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18

ECAM System	Affected System	OVHD RESET Panel	System Control Panel	Reset Procedure
MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012490.0002001 / 20 MAR 17

SMOKE	Smoke detection function of the CIDS-SDF	2		**On ground** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 10 s - Push both SDF 1 and SDF 2 reset buttons. - Wait 3 min for the system restart to be completed. **In flight** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 3 s - Push both SDF 1 and SDF 2 reset buttons - Wait 1 min for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0004001 / 20 MAR 17

VENT	VENT CONT	2		If, in flight, the SMOKE CAB REST SMOKEwarning has been temporarily displayed and identified as a false warning, crew rest compartment ventilation may be recovered by resetting both VENT controller channels (simultaneously pull both ventilation controller RESET pb for at least 5 s, then push them).
	AEVC	1		Apply standard reset procedure.

SYSTEM RESET TABLE

Applicable to: LV-FVI

Ident.: PRO-ABN-ABN-RST-B-00012493.0001001 / 03 NOV 22

ECAM System	Affected System	MANUAL RESET OVHD RESET Panel	MANUAL RESET System Control Panel	Reset Procedure
A-ICE	WHC	2		On ground: If the air conditioning packs are OFF with the OAT above 40 °C, and/or the windshield is under direct sunlight, a spurious A.ICE L(R) WSHLD(WINDOW) HEAT may trigger. In that case, select both air conditioning packs to ON and wait at least 5 min for the cockpit temperature to decrease. After, use the appropriate WHC reset pb on the OVHD RESET panel. *Note: Associated heating is interrupted, when the reset pb is pulled.*

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Ident.: PRO-ABN-ABN-RST-B-00014541.0004001 / 05 JUN 18

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
AIR	ENG BLEED		AIR panel	**CAUTION** If the AIR ENG 1+2 BLEED FAULT alert requests to apply the "BLEED 1+2 RST PROC", refer to FCOM-QRH ABN-AIR-BLEED 1+2 RESET. ENG BLEED reset is only authorized in the two following cases: - CASE A: AIR ENG 1(2) BLEED FAULT alert - CASE B: AIR ENG 1(2) BLEED NOT CLSD alert Note: *Do not attempt more than one reset. However, if the first reset is unsuccessful and if the AIR ENG 1(2) BLEED FAULT alert occurred after takeoff with APU bleed ON, a second reset may be attempted when flight conditions permit and when the aircraft is stabilized in level flight.* **CASE A: AIR ENG 1(2) BLEED FAULT alert:** **On ground or in flight** • **If the PACK (non-affected side) is operative, and If the Wing Anti-Ice is OFF:** - ENG BLEED (affected side)..............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - X BLEED..AUTO *Disregard the AIR ABNORM BLEED CONFIG alert.* - PACK (affected side).................................ON - ENG BLEED (affected side)......................ON - Check that the affected Engine Bleed Valve is open on the BLEED SD page. • **If AIR ENG (AFFECTED) BLEED FAULT alert reoccurs, or If Engine Bleed Valve (affected side) not open on the BLEED SD page:** - ENG BLEED (affected side).............OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- X BLEED.......................................OPEN *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).* **CASE B:** AIR ENG 1(2) BLEED NOT CLSD **alert:** **On ground only** - ENG BLEED (affected side)...............................OFF ■ **If the ENG BLEED (affected side) pb-sw FAULT light is on:** - Delay application of the reset until FAULT light extinguishes. ■ **If the ENG BLEED (affected side) pb-sw FAULT light is off:** - ENG BLEED (affected side)........................ON - Check that the affected Engine Bleed Valve is closed on the BLEED SD page. *Note: Record the ENG BLEED reset in the logbook (successful or unsuccessful).*
	PACK CONT	2		Apply standard reset procedure.

Ident.: PRO-ABN-ABN-RST-B-00012498.0001001 / 20 MAR 17

APU	ECB		APU MASTER sw	Reset must only be attempted when APU speed is below 7 %.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
Ident.: PRO-ABN-ABN-RST-B-00012110.0001001 / 05 MAY 22				
AUTO FLT	A/THR		ENG MASTER panel	**On ground, before taxi only:** Only in case of AUTO FLT A/THR OFF alert: • If no engine running: - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR. • If at least one engine is running: - Apply external power or APU generator power - ENG MASTER (running engine(s))......................................OFF - Press FCU A/THR pb in order to re-engage the A/THR (this will cancel the ECAM alert) - Press A/THR instinctive disconnect pb to disconnect A/THR.
	FCU	2		**In flight:** - When PART FCU is displayed as INOP SYS, do not reset the FCU - When FCU is displayed as INOP SYS, check FCU targets after the reset. **On ground:** - The flight crew can reset the FCU when either FCU or PART FCU is displayed as INOP SYS - The FCU has to be reconfigured after the reset. *Note:* *Following a total FCU reset either in flight or on ground, FCU targets are FCU entries (selected modes).*
	FMGEC and FM	2		**On ground, or in flight:** FMGEC resets results in onside AP disconnection.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				Resynchronization of both FM will occur after a reset sequence, with PLEASE WAIT message on the MCDU and MAP NOT AVAIL on the ND. **CAUTION** Do not use the FM reset buttons. • **If FMGEC1 or FM1 affected:** FMGEC1 reset button [261VU]...........................PULL WAIT 1 s FMGEC1 reset button [261VU]...........................PUSH WAIT END OF RESET • **On ground, if FMGEC1 reset unsuccesful:** Consider FMGEC1 reset with engines not running. *Note: The FMGEC reset is more effective when engines are not running.* • **If FMGEC2 or FM2 affected:** FMGEC2 reset button [262VU]...........................PULL WAIT 1 s FMGEC2 reset button [262VU]...........................PUSH WAIT END OF RESET • **On ground, if FMGEC2 reset unsuccesful:** Consider FMGEC2 reset with engines not running. *Note: The FMGEC reset is more effective when engines are not running.* For more information, *Refer to DSC-22_20-90-10 Manual FMGEC Reset*.
	FMGEC latched (FMGEC)	2		**On ground only:** If all of the following are displayed: - AUTO FLT FM 1(2) FAULT - MAP NOT AVAIL displayed on CAPT (F/O) ND. **CAUTION** Do not use the FM reset buttons. - Set PRIM 1 pb and PRIM 2 pb to OFF • **If FMGEC1 affected:**

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				FMGEC1 reset button [261VU]......................................PULL WAIT 1 s FMGEC1 reset button [261VU]......................................PUSH • **If FMGEC2 affected:** FMGEC2 reset button [262VU]......................................PULL WAIT 1 s FMGEC2 reset button [262VU]......................................PUSH - Set PRIM 1 pb and PRIM 2 pb to ON.
	MCDU		BRT OFF CTL	**On ground, or in flight:** - Set MCDU (affected) to OFF - Wait 10 s - Set MCDU (affected) to ON. *Note: Wait after the message PLEASE WAIT disappears before using MCDU.* If reset unsuccessful set MCDU (affected) to OFF. MCDU 3 will automatically replace affected MCDU 1 or 2.

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Ident.: PRO-ABN-ABN-RST-B-00020972.0001001 / 04 NOV 20

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
BRAKES	Braking malfunction		BSCU	**In flight** Not authorized. **On ground:** If BRAKES RESIDUAL BRAKING: - STOP aircraft - Set PARK BRK handle to ON - Set A/SKID & N/W STRG sw to OFF - Set A/SKID & N/W STRG sw to ON. If WHEEL N/W STRG FAULT: • **Case A** If the three conditions below are fulfilled: - the WHEEL N/W STRG FAULTalert was triggered just after engine start - the NW STRG DISC memo was displayed before the start of the pushback (before the aircraft starts moving) - the NW STRG DISC memo remained displayed even after the pushback is finished (On the NLG electrical deactivation box, the nosewheel steering selector bypass pin is removed and the lever is set back in the steering position). Apply the below reset procedure. If the ECAM alert disappears after the reset, the flight crew may continue the flight without troubleshooting. • **Case B** In all other cases, including in case of doubt on the above conditions, maintenance action is due, even if the ECAM alert disappears after the reset. For a return to the gate: - Apply the below reset procedure - The taxi speed must not exceed 10 kt. ■ **Reset Procedure** - STOP aircraft - Set PARK BRK handle to ON - Confirm that towing bar is disconnected - Set A/SKID & N/W STRG sw to OFF

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
				- Set A/SKID & N/W STRG sw to ON. *Note:* *After any BSCU reset:* *1. Check brake efficiency* *2. Check absence of aircraft veering* *3. Record the BSCU reset in the logbook.*

Ident.: PRO-ABN-ABN-RST-B-00020963.0001001 / 04 JUN 19

CAB PR	CPC	2		- [CAB PRESS SD page] FAULTY CPC..................CHECK • If the faulty CPC is active, force a CPC changeover: - MODE SEL pb............MAN - WAIT 3 s - MODE SEL pb............AUTO - FAULTY CPC.................................RESET During the reset, cabin lights may come on at full intensity and cabin chimes may sound.

7 Ident.: PRO-ABN-ABN-RST-B-00016078.0006001 / 18 DEC 23

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
COM	CIDS	2		**In flight or on ground:** Apply standard reset procedure. In the event of active CIDS reset (usually CIDS 1 when both are operative), a complete power-up test is performed. - In flight, test lasts about 20 s: • The cabin light comes on at full intensity If selected, dimming is lost and must be reselected after the test • PA, CALL and INTERPHONE functions are interrupted and have to be reselected after the test • FAP cabin temperature corrections are lost, and have to be reselected after the test. - On ground, test lasts about 80 s, and includes additionally: • A sequencial cabin loudspeakers test (triggers a tone for about 10 s) • The cabin light might flash shortly. Dimming selection is lost (as in flight). *Note:* *After a CIDS reset is performed, the following messages may be displayed temporarily on the ECAM:* - *SMOKE LAVATORY DET FAULT* - *SMOKE VIDEO 1(2)(3)(4) DET FAULT* .
	ACP/AMU	2		**In flight or on ground:** Apply standard reset procedure.
	RMP		ON/OFF CTL	In the case of freezing of one RMP (impossibility to interchange the ACTIVE and STBY radio navigation or communication frequencies,...), all the RMP's have to be reset, one after the other, to recover a normal operation. **In flight or on ground:** - Set the ON/OFF selector to the OFF position on the RMP panel - Wait at least 5 s - Set the ON/OFF selector to the ON position
	PAX SATCOM SYSTEM		ON/OFF CTL	PAX SATCOM may be reset when PAX communication system is lost. **In flight or on ground:** - Set the PAX SATCOM pb-sw to the OFF position

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
				- Wait 1 s - Set the PAX SATCOM pb-sw to the ON position - Wait 5 min - Perform the CINS reset (*Refer to PRO-ABN-ABN-RST System Reset Table - DATALINK*)
	ELT	1		**In flight or on ground:** - Push the ELT TEST/RESET pb.

Ident.: PRO-ABN-ABN-RST-B-00020961.0001001 / 10 MAY 22

COND	ZONE CONT	1		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00015736.0001001 / 03 NOV 22

DATALINK	ATSU ◁	1		ATSU reset, with the ATSU 1 reset sw on 261 VU (overhead panel), should only be attempted, if: - INVALID DATA is displayed on the DCDU, or - Key selection has no effect on the DCDU or any of the MCDU ATSU DATALINK submenus, or - ADS-C, CPDLC, D-ATIS ◁ , DCL ◁ , OCL ◁ , or AOC is inoperative. When the ATSU is reset, the following connections are no longer active: - CPDLC: • The flight crew should send a notification to the ATC center to re-establish the CPDLC connection. - ADS-C: • The flight crew must check that ADS-C is ARMED or ON. • The flight crew should contact the ATC center by voice to re-establish the ADS-C connection. *Note:* *As no ADS-C disconnect message is sent, the ATC center(s) consider that the ADS-C connection is still alive.*
	AINS ◁	1		Use the AINS reset sw on the 262VU (overhead panel) to reset the AINS. *Note:* *An AINS reset may take up to 20 min.*
	CINS ◁	1		If there is a malfunction of the CINS and if the reset by the cabin crew is unsuccessful, the flight crew can attempt to reset the system using the CINS reset button (overhead panel): pull the button then push it. *Note:* *The CINS reset may take up to 10 min.*

Ident.: PRO-ABN-ABN-RST-B-00012499.0001001 / 20 MAR 17

DOOR	PSCU	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020969.0001001 / 10 MAY 21

EIS	DU (ECAM, PFD, ND)		OFF/BRT CTL	If DU reset is unsuccessful, DMC (driving the affected DU) reset may be attempted.
	DMC	3		**On ground or in flight:** Apply standard reset procedure. *Note:* *On ground, EFIS/ECAM displays are lost for 40 s after reset or power-up.*

Ident.: PRO-ABN-ABN-RST-B-00020968.0001001 / 28 MAY 20

ELEC	GPCU		2 pb on ELEC panel	GPCU reset may be attempted, if AVAIL and ON lights do not light up. 1. Press once the affected EXT A(B) pb to reset the functions of GPCU 2. Check the GPU is connected to the aircraft, then started 3. Check AVAIL light is ON and press the EXT A(B) pb to connect the GPU. If unsuccessful, check GPU voltage and frequency (bite is available on batteries only).
	BCL		3 BAT pb-sw on ELEC panel	Use BAT pb-sw to reset the BCL. Do not reset the BCL when ELEC BAT 1(2) FAULT caution is triggered, and the BAT OFF selection is requested by the ECAM.
	Commercial equipments and galleys		2 pb on ELEC panel	**On ground** When the commercial equipment and/or galley loads have been shed by the ECMU, they can be recovered when more electrical power is available. - If COMMERCIAL OFF is displayed on the ELEC SD page: Switch the COMMERCIAL pb OFF then ON - If GALLEY SHED or GALLEY PARTIALLY SHED is displayed on the ELEC SD page: Switch the GALLEY pb OFF then ON. Do not reset more than one pushbutton at a time.

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Ident.: PRO-ABN-ABN-RST-B-00012500.0001001 / 20 MAR 17

ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	
ENG	EIVMU	2		During the reset, and the subsequent 5 s, the following occurs: • On the corresponding engine: - Loss of thrust reverser - Loss of vibration indication - If idle is selected, only high idle is available - Loss of man start and wet crank - Loss of bleed corrections on thrust limit. • On both engines: - Loss of autothrust - Loss of Flex/Derated T.O.

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Ident.: PRO-ABN-ABN-RST-B-00012491.0003001 / 26 NOV 19

ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	
F/CTL	PRIM and SEC		FLT/CTL panel	**On ground only** - PRIM/SEC may be reset, except in the following case: • The DC BUS 2 FAULT caution is present. *Note:* *Do not attempt a reset because this would result in a loss of related PRIM/SEC* - The reset must be followed by a flight controls' check (*Refer to PRO-NOR-SOP-10-TAXI*). **WARNING** Do not reset more than one computer at a time. *Note:* *When a PRIM reset is performed, the crew must check the pitch trim position.*
	FCDC	2		Apply standard reset procedure.
	SFCC FLAPS 1(2)	2		**On ground only** Only in case of F/CTL FLAP SYS 1(2) FAULT alerts: - Pull FLAPS 1 (261VU) or FLAPS 2 (262VU) reset button - Wait 5 s - Push FLAPS 1 or FLAPS 2 reset button. **WARNING** - Do not perform any reset of the flaps control unit during flaps movement, and - Do not reset more than one SFCC channel at the same time.
	SFCC SLATS 1(2)	2		**On ground only** Only in case of F/CTL SLAT SYS 1(2) FAULTalerts: - Pull SLATS 1 (261VU) or SLATS 2 (262VU) reset button - Wait 5 s - Push SLATS 1 or SLATS 2 reset button. **WARNING** - Do not perform any reset of the slats control unit during slats movement, and - Do not reset more than one SFCC channel at the same time.

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ECAM System	Affected System	MANUAL RESET		Reset Procedure
		OVHD RESET Panel	System Control Panel	

Ident.: PRO-ABN-ABN-RST-B-00012492.0005001 / 03 NOV 21

FUEL	FCMC	2		- If the reset is done before engine start, the ZFW and ZFWCG must be re-entered on the INIT FUEL PRED page. - If the reset is done after engine start, the actual GW and CG displayed on the FUEL PRED page are computed by the FE. However, the GW computed by the FE may be less accurate, therefore, when time permits: • If the reset is successful, the actual GW and CG must be re-entered on the FUEL PRED page • If the reset is unsuccessful, the flight crew must determine the FOB from the engine start fuel quantity minus the FU quantity indication.
				In the case of triggering of FUEL ZFW ZFCG DISAGREE, if the ZFW, ZFWCG, ECAM GW are the same as the loadsheet values, but the difference between the ECAM CG and the loadsheet CG is more than 2 %: **On ground:** - Reinsert the ZFW and ZFCG values. If the ECAM alert is still displayed after reinsertion: • Simultaneously pull FCMC 1 and FCMC 2 reset buttons • Simultaneously push FCMC 1 and FCMC 2 reset buttons. **If unsuccessful, on ground:** - Simultaneously pull FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons - Simultaneously push FCMC 1, FCMC 2, FMGEC 1 and FMGEC 2 reset buttons. *Refer to PRO-ABN-ABN-RST System Reset Table - AUTO FLT* for additional information regarding the FMGEC resets.

Ident.: PRO-ABN-ABN-RST-B-00020970.0001001 / 20 MAR 17

FWS	FWC SDAC	2		Apply standard reset procedure.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00020971.0001001 / 05 MAR 19

L/G	LGCIU	2		**CAUTION** An LGCIU reset must neither be made during landing gear extension or retraction, nor just prior to touchdown. Apply standard reset procedure. *Note:* *In the case of L/G Selector Lever that does not move up after take-off (baulked lever), normal operation of the L/G Selector Lever may be recovered by reset of LGCIUs :* - *Reset one LGCIU (LGCIU1 or LGCIU2).* - *If not successful (after the reset of the first LGCIU the L/G Selector Lever still does not move up), reset the other LGCIU.*

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012496.0001001 / 04 DEC 18

MISC	VSC		Cabin aft C/B panel (VACUUM TOILET SYSTEM)	**On the ground or in flight** If all toilets on one or both sides of the aircraft are shut down, apply the following reset: - RESET VACUUM TOILET SYSTEM (blue pb) The repeated use of the blue pb is not recommended. **If not successful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - WAIT 10 s - PUSH C/Bs LAVATORY POWER - PUSH C/Bs SYSTEM and VACUUM GEN. **If still unsuccessful and there is no waste tank overfill** Apply the following procedure on one or both system sides: - PULL C/Bs SYSTEM and VACUUM GEN - PULL C/Bs LAVATORY POWER - PUSH C/Bs LAVATORY POWER - C/Bs SYSTEM and VACUUM GEN remain pulled. In this configuration, all of the following apply: - The waste quantity indication is lost - The protection against the waste tank overfill is lost - When the aircraft is below 16 000 ft do not use the toilets - On the ground, during servicing, do not use the toilets.

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ECAM System	**Affected System**	**MANUAL RESET**		**Reset Procedure**
		OVHD RESET Panel	**System Control Panel**	

Ident.: PRO-ABN-ABN-RST-B-00012490.0002001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
SMOKE	Smoke detection function of the CIDS-SDF	2		**On ground** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 10 s - Push both SDF 1 and SDF 2 reset buttons. - Wait 3 min for the system restart to be completed. **In flight** - Pull both SDF 1 (261VU) and SDF 2 (262VU) reset buttons - Wait 3 s - Push both SDF 1 and SDF 2 reset buttons - Wait 1 min for the system restart to be completed.

Ident.: PRO-ABN-ABN-RST-B-00020960.0004001 / 20 MAR 17

ECAM System	**Affected System**	**OVHD RESET Panel**	**System Control Panel**	**Reset Procedure**
VENT	VENT CONT	2		If, in flight, the SMOKE CAB REST SMOKEwarning has been temporarily displayed and identified as a false warning, crew rest compartment ventilation may be recovered by resetting both VENT controller channels (simultaneously pull both ventilation controller RESET pb for at least 5 s, then push them).
	AEVC	1		Apply standard reset procedure.

[QRH] DOUBLE AOA HEAT FAILURE

Ident.: PRO-ABN-A-ICE-00018753.0001001 / 17 MAR 17
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

In the case of double failure of alpha probe heaters, the choice made by the computers among the 3 ADR values may be erroneous.

One of affected ADRs ....OFF

NAV ADR 1(2)(3) FAULT
In the case of disagreement between the two remaining ADRs, the NAV ADR DISAGREE ECAM or the NAV AOA DISAGREEECAM alert will trigger.

A.ICE CAPT + F/O AOA HEAT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

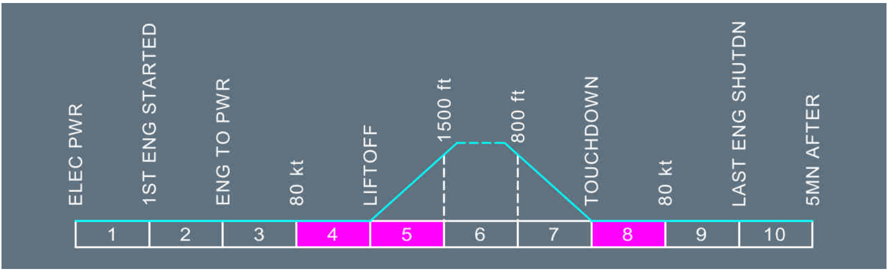
Ident.: PRO-ABN-A-ICE-AG-00021007.0001001 / 14 FEB 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of the CAPT and F/O AOA probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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A.ICE CAPT + F/O AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AG-00021008.0002001 / 14 MAY 19

L2 In the case of simultaneous AOA probes icing and if the AOA probes are blocked at the same value, ADR 1 and ADR 2 AOA values will be coherent, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, AOA sources.

L1 ■ **If all probes heating is lost on the CAPT and/or F/O side:**

PROBE/WINDOW HEAT..ON

L2 *In some failure conditions, probe heating may be recovered.*

L1 ● **IF UNSUCCESSFUL:**

ADR 1(2) P/B..OFF

L2 *Depending on the status of the static, pitot and TAT heating, the procedure requires that either ADR 1 or 2 be switched OFF.*

Note: In the case of subsequent, significant, AOA discrepancy between the two remaining ADRs, the NAV ADR DISAGREE or NAV AOA DISAGREE alert will trigger.

L1 ■ **In all other cases**

ADR 1(2) P/B..OFF

L2 *Depending on the status of the static, pitot and TAT heating, the procedure requires that either ADR 1 or 2 be switched OFF.*

Note: In the case of subsequent, significant, AOA discrepancy between the two remaining ADRs, the NAV ADR DISAGREE or NAV AOA DISAGREE alert will trigger.

L1

ASSOCIATED PROCEDURES

NAV ADR 1(2) FAULT

Continued on the following page

A.ICE CAPT + F/O AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AG-00021009.0001001 / 14 FEB 17

STATUS

INOP SYS

CAPT AOA
F/O AOA
CAPT PROBES (1)
F/O PROBES (2)

(1) *(If all CAPT PROBES heating is lost)*
(2) *(If all F/O PROBES heating is lost)*

A.ICE CAPT + STBY AOA HEAT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

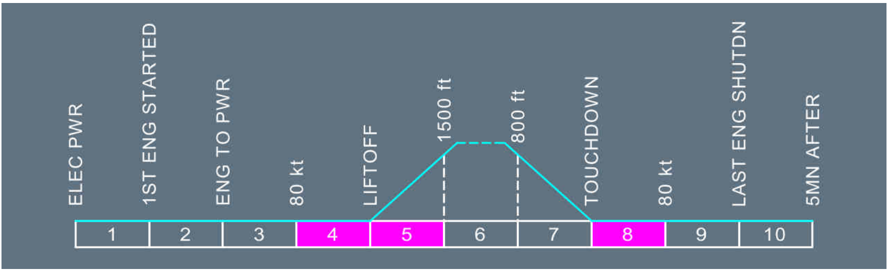
Ident.: PRO-ABN-A-ICE-AH-00021012.0001001 / 14 FEB 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the CAPT and STBY AOA probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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A.ICE CAPT + STBY AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AH-00021013.0002001 / 14 MAY 19

L2 In the case of simultaneous AOA probes icing and if the AOA probes are blocked at the same value, ADR 1 and ADR 3 AOA values will be coherent, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, AOA sources.

L1 ■ **If all probes heating is lost on the CAPT and/or STBY side:**

PROBE/WINDOW HEAT..ON

L2 *In some failure conditions, probe heating may be recovered.*

L1 ● **IF UNSUCCESSFUL:**

ADR 1(3) P/B..OFF

L2 *Depending on the status of the static, pitot and TAT heating, the procedure requires that either ADR 1 or 3 be switched OFF.*

Note: In the case of subsequent, significant, AOA discrepancy between the two remaining ADRs, the NAV ADR DISAGREE or NAV AOA DISAGREE alert will trigger.

L1 ■ **In all other cases**

ADR 1(3) P/B..OFF

L2 *Depending on the status of the static, pitot and TAT heating, the procedure requires that either ADR 1 or 3 be switched OFF.*

Note: In the case of subsequent, significant, AOA discrepancy between the two remaining ADRs, the NAV ADR DISAGREE or NAV AOA DISAGREE alert will trigger.

L1

ASSOCIATED PROCEDURES

NAV ADR 1(3) FAULT

Continued on the following page

A.ICE CAPT + STBY AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AH-00021014.0001001 / 14 FEB 17

STATUS

INOP SYS

CAPT AOA
STBY AOA
CAPT PROBES (1)
STBY PROBES (2)

(1) *(If all CAPT PROBES heating is lost)*
(2) *(If all STBY PROBES heating is lost)*

A.ICE F/O + STBY AOA HEAT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

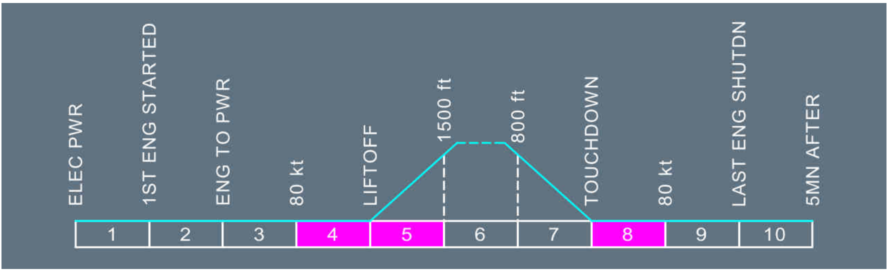
Ident.: PRO-ABN-A-ICE-AI-00021018.0001001 / 14 FEB 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of the F/O and STBY AOA probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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A.ICE F/O + STBY AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AI-00021016.0002001 / 14 MAY 19

L2 In the case of simultaneous AOA probes icing and if the AOA probes are blocked at the same value, ADR 2 and ADR 3 AOA values will be coherent, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, AOA sources.

L1 ■ **If all probes heating is lost on the F/O and/or STBY side:**

PROBE/WINDOW HEAT....................ON

L2 *In some failure conditions, probe heating may be recovered.*

L1 ● **IF UNSUCCESSFUL:**

ADR 2(3) P/B....................OFF

L2 *Depending on the status of the static, pitot and TAT heating, the procedure requires that either ADR 2 or 3 be switched OFF.*

Note: In the case of subsequent, significant, AOA discrepancy between the two remaining ADRs, the NAV ADR DISAGREE or NAV AOA DISAGREE alert will trigger.

L1 ■ **In all other cases**

ADR 2(3) P/B....................OFF

L2 *Depending on the status of the static, pitot and TAT heating, the procedure requires that either ADR 2 or 3 be switched OFF.*

Note: In the case of subsequent, significant, AOA discrepancy between the two remaining ADRs, the NAV ADR DISAGREE or NAV AOA DISAGREE alert will trigger.

L1

ASSOCIATED PROCEDURES

NAV ADR 2(3) FAULT

Continued on the following page

A.ICE F/O + STBY AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-AI-00021015.0001001 / 14 FEB 17

STATUS

INOP SYS

F/O AOA
STBY AOA
F/O PROBES (1)
STBY PROBES (2)

(1) *(If all F/O PROBES heating is lost)*
(2) *(If all STBY PROBES heating is lost)*

A. ICE CAPT(F/O)(STBY) PROBES HEAT

Applicable to: ALL

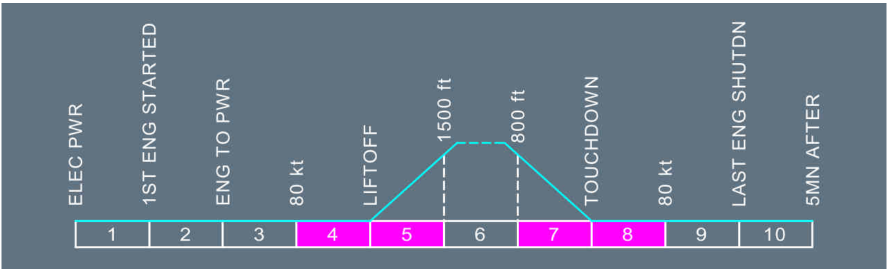
Ident.: PRO-ABN-A-ICE-G-00017297.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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A. ICE CAPT(F/O)(STBY) PROBES HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-G-00018717.0001001 / 21 MAR 16

PROBE WINDOW HEAT.......................................ON

- **IF UNSUCCESSFUL:**

  AIR DATA SWTG.......................................CAPT ON 3 (F/O ON 3) (AS RQRD)

- **IF ICING EXPECTED:**

  If two ADRs are failed or OFF.

  UNREL SPD PROC.......................................APPLY

Ident.: PRO-ABN-A-ICE-G-00018718.0001001 / 21 MAR 16

STATUS

	INOP SYS
● **IF ICING EXPECTED:** If two ADRs are failed or OFF. UNREL SPD PROC.......................................APPLY	CAPT (F/O) (STBY) PROBES

A. ICE CAPT (F/O) TAT HEAT

Applicable to: ALL

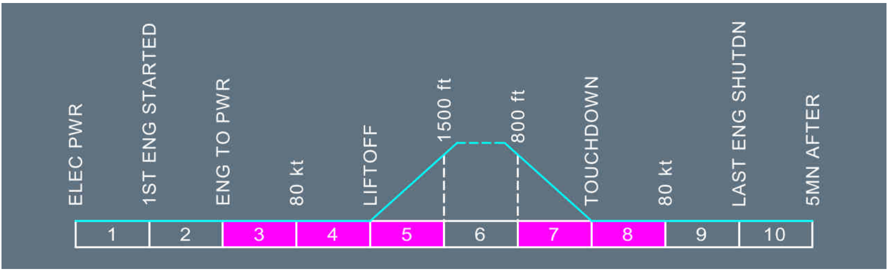
Ident.: PRO-ABN-A-ICE-V-00017301.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-V-00010161.0001001 / 23 JUN 15

- **If TAT abnormally heated on ground:**
  TAT HEATED ON GND

Ident.: PRO-ABN-A-ICE-V-00017059.0001001 / 23 JUN 15

STATUS

INOP SYS

CAPT (F/O) TAT (1)

(1) *(Displayed in flight only, if TAT heating is lost)*

A. ICE CAPT PITOT OR L(R) STAT OR AOA HEAT

Applicable to: ALL

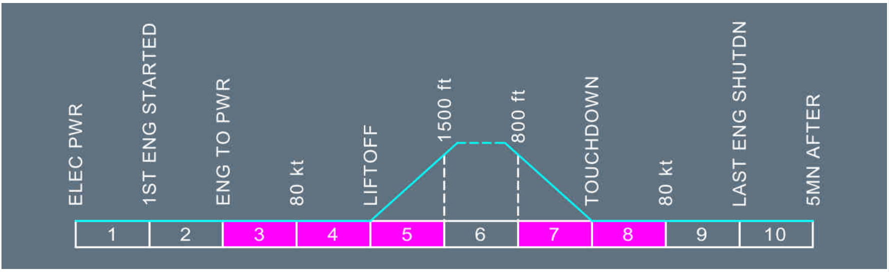
Ident.: PRO-ABN-A-ICE-D-00017298.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-D-00018407.0001001 / 21 MAR 16

AIR DATA SWTG (IF ADR 3 AVAIL AND NOT USED).. CAPT ON 3

L2 *ADR 3 supplies data to PFD 1 and ND 1.*

L1
- **IF ICING EXPECTED:**

  Only for PITOT HEAT FAULT, and if ADR 2 and 3 are failed or OFF.

  UNREL SPD PROC.. APPLY

Ident.: PRO-ABN-A-ICE-D-00018719.0001001 / 21 MAR 16

STATUS

- **IF ICING EXPECTED:**

  Only for PITOT HEAT FAULT, and if ADR 2 and 3 are failed or OFF.

  UNREL SPD PROC................................APPLY

INOP SYS

CAPT PITOT
L(R) CAPT STAT
CAPT AOA

A. ICE DETECT FAULT

Applicable to: ALL

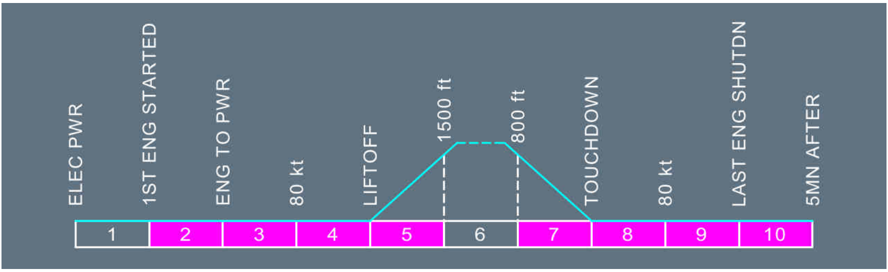
Ident.: PRO-ABN-A-ICE-Q-00017308.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ice detection system is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-Q-00018836.0001001 / 21 MAR 16

ANTI ICE...AS RQRD

Ident.: PRO-ABN-A-ICE-Q-00010190.0001001 / 06 AUG 10

STATUS

INOP SYS

ICE DETECT

A. ICE ENG 1(2) VALVE CLOSED

Applicable to: ALL

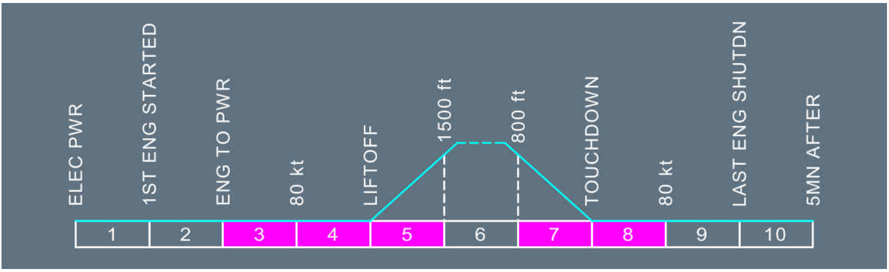
Ident.: PRO-ABN-A-ICE-J-00017289.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the valve is abnormally closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-J-00010166.0001001 / 06 AUG 10

AVOID ICING CONDITIONS

Ident.: PRO-ABN-A-ICE-J-00010168.0001001 / 06 AUG 10

STATUS

AVOID ICING CONDITIONS

INOP SYS

ENG 1(2) A. ICE

A. ICE ENG 1(2) VALVE OPEN

Applicable to: ALL

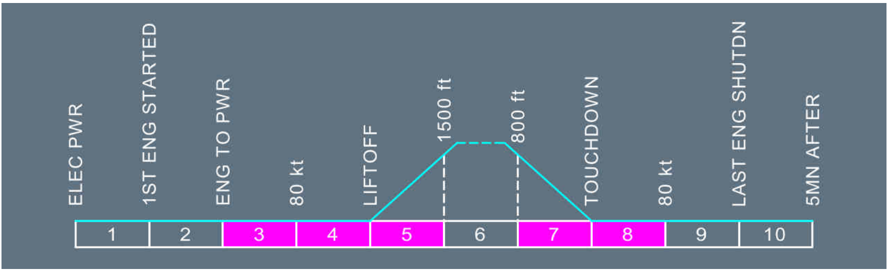
Ident.: PRO-ABN-A-ICE-AB-00017288.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the valve is abnormally open.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-AB-00018808.0001001 / 21 MAR 16

L2 If the fault occurs before takeoff, it may cause an ENG THRUST LOSS caution during takeoff power application.
Refer to MEL/ME-30 A.ICE ENG VALVE OPEN for dispatch.

L1 Crew awareness.

A. ICE F/O PITOT OR L(R) STAT OR AOA HEAT

Applicable to: ALL

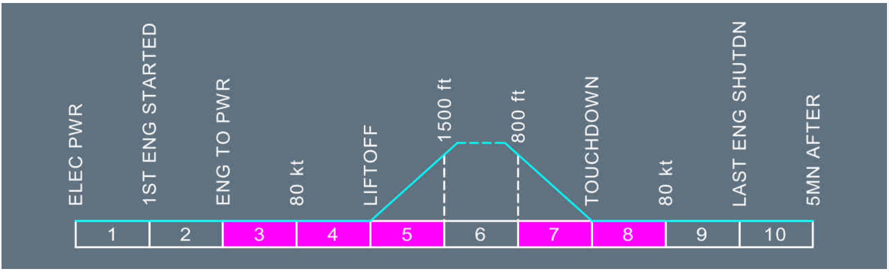
Ident.: PRO-ABN-A-ICE-E-00017299.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-E-00018730.0001001 / 21 MAR 16

AIR DATA SWTG (IF ADR 3 AVAIL, AND NOT USED)..F/O ON 3

L2 *ADR 3 supplies data to PFD 2 and ND 2.*

L1 ● **IF ICING EXPECTED:**

L2 Only for PITOT HEAT FAULT, and if ADR 1 and 3 are failed or OFF.

L1 UNREL SPD PROC.. APPLY

Ident.: PRO-ABN-A-ICE-E-00018731.0001001 / 21 MAR 16

STATUS

● **IF ICING EXPECTED:**

Only for PITOT HEAT FAULT, and if ADR 1 and 3 are failed or OFF.

UNREL SPD PROC..APPLY

INOP SYS

F/O PITOT
L(R) F/O STAT
F/O AOA

A.ICE ICE DETECTED

Applicable to: ALL

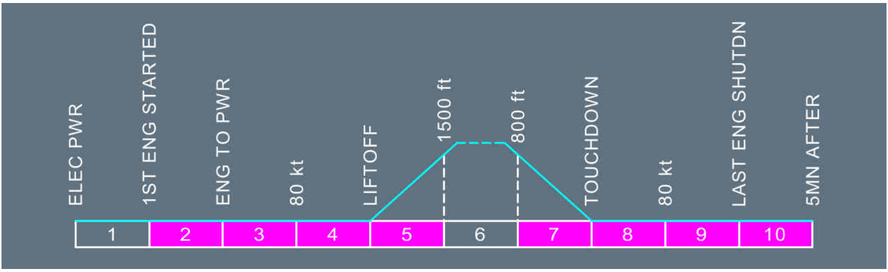
Ident.: PRO-ABN-A-ICE-AD-00017306.0002001 / 02 MAY 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when ice is detected in flight above 1 500 ft (with TAT < 10 °C) and the engine anti-ice is off.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-AD-00018837.0001001 / 21 MAR 16

ENG (ALL) ANTI ICE..........ON

A. ICE L(R) INR(OUTR) WING HI PR

Applicable to: ALL

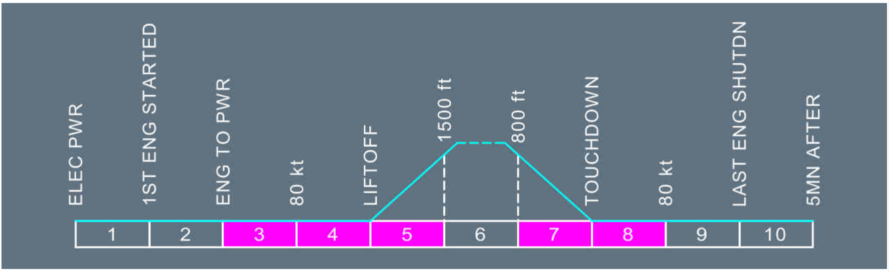
Ident.: PRO-ABN-A-ICE-AE-00017285.0002001 / 22 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a high pressure in the wing anti ice duct is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-AE-00018735.0001001 / 21 MAR 16

Crew awareness.

A. ICE L(R) INR(OUTR) WING LO PR

Applicable to: ALL

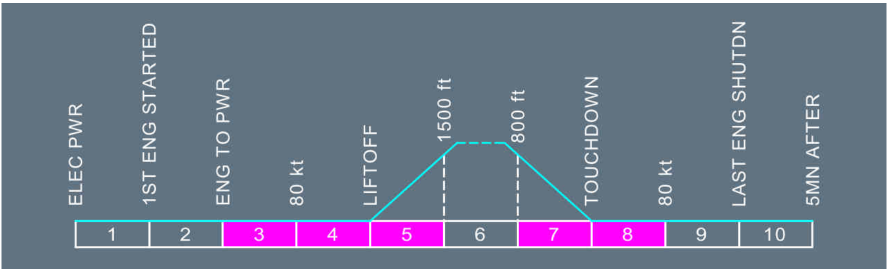
Ident.: PRO-ABN-A-ICE-K-00017286.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a low pressure in the wing anti ice duct is detected and the WING ANTI ICE pb-sw is set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-K-00018738.0006001 / 21 MAR 16

THRUST .... INCREASE

- **IF UNSUCCESSFUL:**

  WING ANTI ICE .... OFF

  AVOID ICING CONDITIONS

  - **IF SEVERE ICE ACCRETION:**

    MIN SPD .... VLS +10/G DOT

    MANEUVER WITH CARE

Continued on the following page

A. ICE L(R) INR(OUTR) WING LO PR (Cont'd)

Ident.: PRO-ABN-A-ICE-K-00018739.0004001 / 21 MAR 16

L12

STATUS

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**

  MIN SPD....................VLS +10/G DOT

  Note: *The speed must not be lower than:*
  - *G DOT, when in CONF 0*
  - *VLS + 10 kt, for other configurations.*

  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION:**

  APPR SPD....................VLS +10 KT

  LDG DIST PROC....................APPLY

  Note: *In the case of severe ice accretion, with wing anti ice failed, the angle-of-attack protections are still efficient. However, if full back stick is maintained while at maximum angle-of-attack, a divergent roll oscillation may appear. Releasing slightly the stick will stop this oscillation.*

INOP SYS

WING A. ICE

A. ICE L(R) INR(OUTR) WING OPEN
(FAILURE DETECTED ON GROUND)

Applicable to: ALL

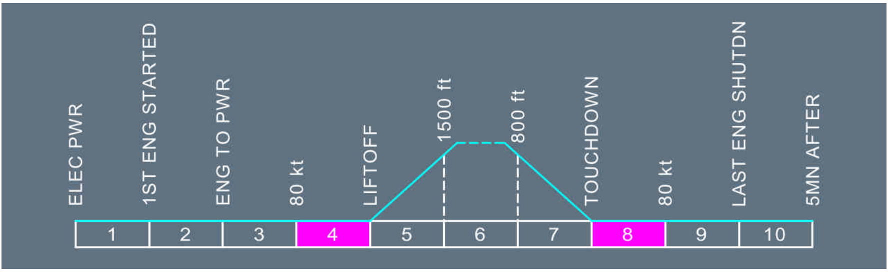
Ident.: PRO-ABN-A-ICE-M-00017287.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers on ground when one wing anti ice valve remains open and the WING ANTI ICE pb-sw is set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

A. ICE L(R) INR(OUTR) WING OPEN (Cont'd)
(FAILURE DETECTED ON GROUND)

Ident.: PRO-ABN-A-ICE-M-00018745.0001001 / 21 MAR 16

WING ANTI ICE.......................................OFF
X BLEED (IF NOT CLOSED).......................................CLOSE
ENG BLEED (AFFECTED SIDE).......................................OFF
APU BLEED (IF LEFT WING AFFECTED).......................................OFF
WAI AVAIL IN FLT

- **After takeoff, when above 1 500 ft (automatic recall):**

  ENG BLEED (AFFECTED SIDE).......................................ON
  X BLEED.......................................AUTO
  WING ANTI ICE.......................................AS RQRD

  L2 *On the failed side, wing anti-ice is continually ON, and is therefore available, if needed.*

  L1 WAI AVAIL IN FLT

- **After landing (automatic recall):**

  WING ANTI ICE.......................................OFF
  X BLEED (IF NOT CLOSED).......................................CLOSE
  ENG BLEED (AFFECTED SIDE).......................................OFF
  APU BLEED (IF LEFT WING AFFECTED).......................................OFF

Ident.: PRO-ABN-A-ICE-M-00018746.0001001 / 21 MAR 16

STATUS

	INOP SYS
WAI AVAIL IN FLT	ENG BLEED PACK

A.ICE L(R) INR(OUTR) WING OPEN
(FAILURE DETECTED IN FLIGHT)

Applicable to: ALL

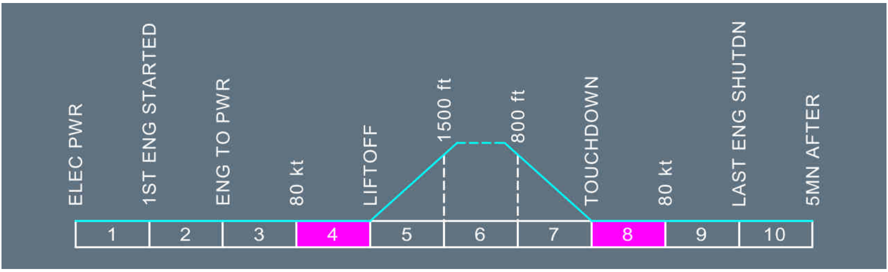
Ident.: PRO-ABN-A-ICE-N-00017894.0001001 / 21 MAR 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers in flight when one wing anti ice valve remains open and the WING ANTI ICE pb-sw is set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-N-00018748.0001001 / 21 MAR 16

WING ANTI ICE..AS RQRD

WAI AVAIL IN FLT

L2 *On the failed side, wing anti-ice is continually ON, and is therefore available, if needed.*

L1
- **Depending on bleed configuration:**

  X BLEED..OPEN OR AUTO

- **After landing (automatic recall):**

  Refer to PRO-ABN-A-ICE A.ICE L(R) WING OPEN (Failure Detected on Ground).

Continued on the following page

A.ICE L(R) INR(OUTR) WING OPEN (Cont'd)
(FAILURE DETECTED IN FLIGHT)

Ident.: PRO-ABN-A-ICE-N-00018749.0001001 / 21 MAR 16

STATUS

WAI AVAIL IN FLT

A. ICE L(R) WSHLD HEAT

Applicable to: ALL

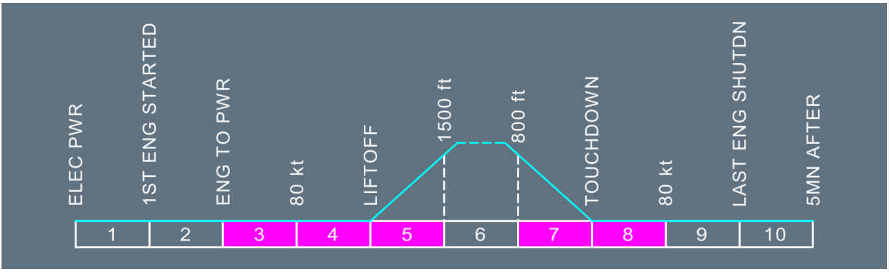
Ident.: PRO-ABN-A-ICE-A-00017294.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the left(right) windshield is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-A-00010149.0001001 / 06 AUG 10

- **If due to a WHC command failure:**

  L(R) WINDOW HEAT

  PROBE WINDOW HEAT...ON

Continued on the following page

A. ICE L(R) WSHLD HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-A-00010150.0001001 / 06 AUG 10

STATUS

INOP SYS

L(R) WSHLD HEAT

A. ICE L + R WSHLD HEAT

Applicable to: ALL

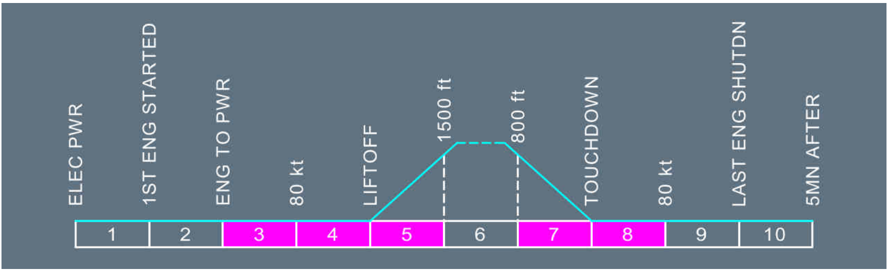
Ident.: PRO-ABN-A-ICE-B-00017295.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of both windshields are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-B-00010151.0001001 / 06 AUG 10

- **If due to a WHC command failure:**

  L + R WINDOW HEAT

  PROBE WINDOW HEAT.....ON

Continued on the following page

A. ICE L + R WSHLD HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-B-00010152.0001001 / 06 AUG 10

STATUS

INOP SYS

WSHLD HEAT
WINDOW HEAT [(1)]

(1) *(If WHC command failed)*

A. ICE L(R)(L + R) WINDOW HEAT

Applicable to: ALL

Ident.: PRO-ABN-A-ICE-C-00017296.0002001 / 21 MAR 16

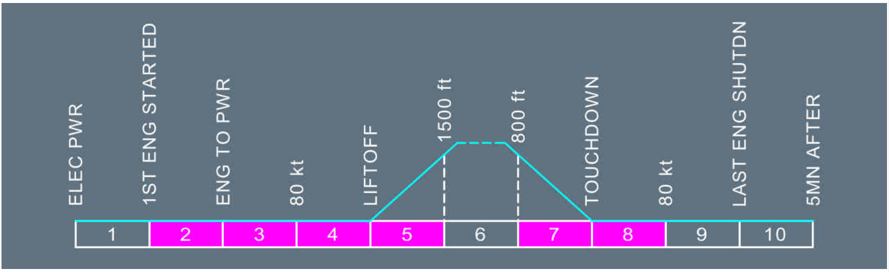
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- The heating system of the left(right) cockpit window is failed, or
- The heating systems of both cockpit windows are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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A. ICE L(R)(L + R) WINDOW HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-C-00010153.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-A-ICE-C-00010154.0001001 / 06 AUG 10

STATUS

INOP SYS

L(R) WNDOW HEAT (WINDOW HEAT)

A. ICE STBY PITOT OR L(R) STAT OR AOA HEAT

Applicable to: ALL

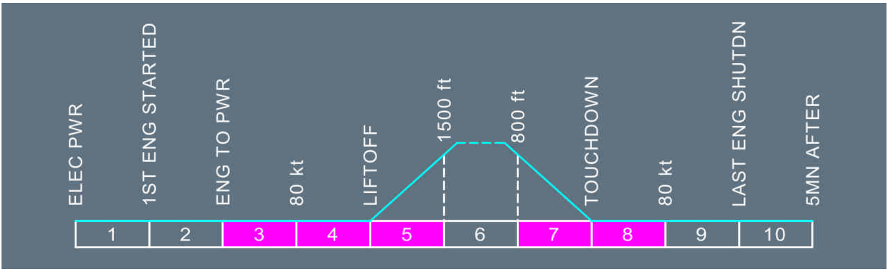
Ident.: PRO-ABN-A-ICE-F-00017300.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating system of the corresponding probe is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

A. ICE STBY PITOT OR L(R) STAT OR AOA HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-F-00010159.0001001 / 06 AUG 10

AIR DATA SWTG.. AS RQRD

L2 *If STBY instruments are used, monitor air data information.*

Ident.: PRO-ABN-A-ICE-F-00010160.0001001 / 06 AUG 10

STATUS

INOP SYS

STBY PITOT (STBY L(R) STAT)
(STBY AOA)

A. ICE WAI SYS FAULT
(WING ANTI ICE PUSHBUTTON OFF - ALL WAI VALVES OPEN)

Applicable to: ALL

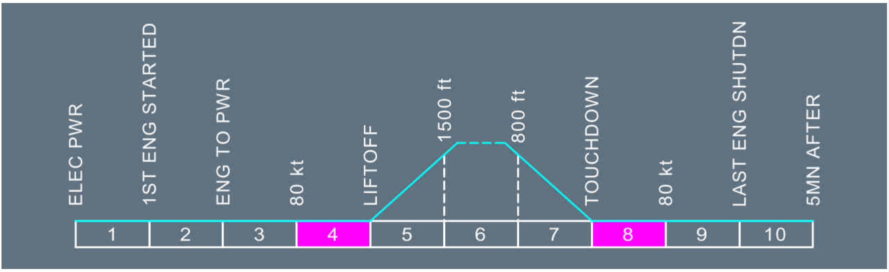
Ident.: PRO-ABN-A-ICE-P-00017281.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the when the wing anti-ice relay is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

A. ICE WAI SYS FAULT (Cont'd)
(WING ANTI ICE PUSHBUTTON OFF - ALL WAI VALVES OPEN)

Ident.: PRO-ABN-A-ICE-P-00018810.0001001 / 21 MAR 16

WING ANTI ICE ON

- **On ground:**
  X BLEED (IF NOT CLOSED)................CLOSE
  ENG BLEED (ALL)................OFF
  APU BLEED................OFF
  WAI AVAIL IN FLT
- **In flight, or after takeoff, when above 1 500 ft (automatically recall):**
  ENG BLEED (ALL)................ON
  X BLEED (DEPENDING ON BLEED CONFIGURATION)................OPEN OR AUTO
- **After landing (automatically recall):**
  X BLEED (IF NOT CLOSED)................CLOSE
  ENG BLEED (ALL)................OFF
  APU BLEED................OFF

Ident.: PRO-ABN-A-ICE-P-00019093.0001001 / 21 MAR 16

STATUS

	INOP SYS
WAI AVAIL IN FLT	ENG BLEED (ALL)

A. ICE WAI SYS FAULT
(WING ANTI ICE PUSHBUTTON ON - ALL WAI VALVES CLOSED)

Applicable to: ALL

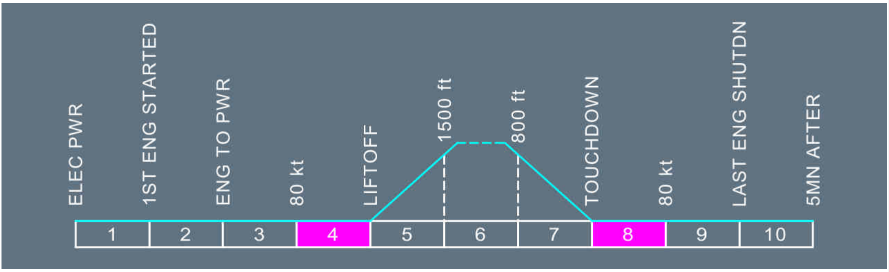
Ident.: PRO-ABN-A-ICE-O-00017895.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the when the wing anti-ice relay is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-O-00018812.0009001 / 21 MAR 16

WING ANTI ICE...OFF
AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**

  MIN SPD.. VLS +10/G DOT

  MANEUVER WITH CARE

Continued on the following page

A. ICE WAI SYS FAULT (Cont'd)
(WING ANTI ICE PUSHBUTTON ON - ALL WAI VALVES CLOSED)

Ident.: PRO-ABN-A-ICE-O-00018813.0004001 / 21 MAR 16

L12

STATUS

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**

  MIN SPD....................VLS +10/G DOT

  Note: *The speed must not be lower than:*
  - *G DOT, when in CONF 0*
  - *VLS + 10 kt, for other configurations.*

  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION:**

  APPR SPD....................VLS +10 KT

  LDG DIST PROC....................APPLY

  Note: *In the case of severe ice accretion, with wing anti-ice failed, the angle-of-attack protections are still efficient. However, if full backstick is maintained, while at the maximum angle-of-attack, a divergent roll oscillation may appear. Slightly releasing the stick will stop this oscillation.*

INOP SYS

WING A. ICE

A. ICE WING OPEN ON GND

Applicable to: ALL

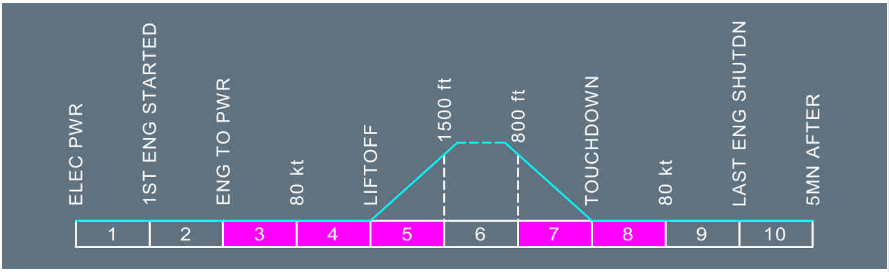
Ident.: PRO-ABN-A-ICE-I-00017284.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the aircraft is on ground and the wing anti ice valves remain open for more than 40 s after the WING ANTI ICE pb-sw is set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-I-00018751.0001001 / 21 MAR 16

WING ANTI ICE.. OFF
WAI AVAIL IN FLT

Ident.: PRO-ABN-A-ICE-I-00010172.0001001 / 06 AUG 10

STATUS

WAI AVAIL IN FLT

A. ICE WING VLVE NOT OPEN

Applicable to: ALL

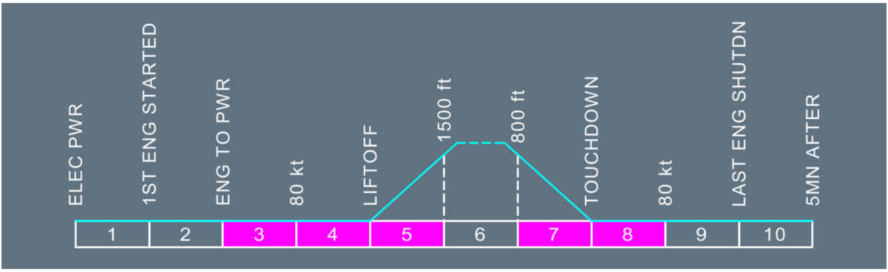
Ident.: PRO-ABN-A-ICE-L-00017283.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers in flight when one wing anti ice remains closed and the WING ANTI ICE pb-sw is set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-A-ICE-L-00018672.0006001 / 21 MAR 16

WING ANTI ICE.. OFF
AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**
  MIN SPD.. VLS +10/G DOT
  MANEUVER WITH CARE

Continued on the following page

A. ICE WING VLVE NOT OPEN (Cont'd)

Ident.: PRO-ABN-A-ICE-L-00018673.0004001 / 21 MAR 16

L12

STATUS

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**

  MIN SPD...VLS +10/G DOT

  Note: *The speed must not be lower than:*
  - *G DOT, when in CONF 0*
  - *VLS + 10 kt, for other configurations.*

  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION:**

  APPR SPD .... VLS +10 KT

  LDG DIST PROC..APPLY

  Note: *In the case of severe ice accretion, with wing anti-ice failed, the angle-of-attack protections are still efficient. However, if full backstick is maintained, while at the maximum angle-of-attack, a divergent roll oscillation may appear. Slightly releasing the stick will stop this oscillation.*

INOP SYS

WING A. ICE

A.ICE ALL PITOT HEAT

Applicable to: ALL

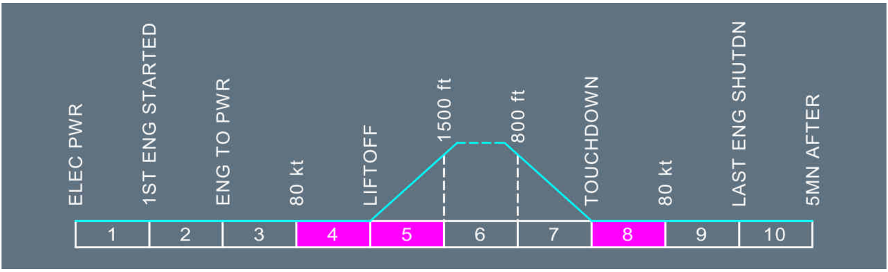
Ident.: PRO-ABN-A-ICE-U-00017305.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of the CAPT, F/O and STBY probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

A.ICE ALL PITOT HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-U-00018754.0002001 / 07 JUN 16

L2 In the case of simultaneous pitot icing and in the same amount, ADR 1, ADR 2, and ADR 3 speeds will be in agreement, but incorrect. The following ECAM procedure avoids that the flight controls use erroneous, but coherent, sources.

L1
- **If all probes heating is lost on the CAPT and/or F/O and/or STBY side:**

  PROBE/WINDOW HEAT.......... ON

- **IF UNSUCCESSFUL:**

  ADR 1(2)(3) P/B.......... OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1, 2 or 3 be switched OFF.*

Note: In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the "ADR DISAGREE" ECAM caution will trigger.

L1
  - **IF ICING EXPECTED:**

    ADR 2(3) P/B.......... OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.*

L1 UNREL SPD PROC.......... APPLY

L2 *Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items).*

L12

ASSOCIATED PROCEDURES

NAV ADR FAULT

Single ADR FAULT or double ADR FAULT ECAM cautions may trigger, depending on the number of ADR switched OFF.

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW (PROT LOST)

Alternate law becomes active, if:

- *One ADR was already switched OFF, and the two remaining ADRs are not in agreement, or*

Continued on the following page

A.ICE ALL PITOT HEAT (Cont'd)

- *Two ADRs were switched OFF.*

Ident.: PRO-ABN-A-ICE-U-00018755.0002001 / 21 MAR 16

STATUS

- **IF ICING EXPECTED:**
  ADR 2(3) P/B.. OFF
  UNREL SPD PROC..APPLY

INOP SYS

CAPT PITOT
F/O PITOT
STBY PITOT
CAPT PROBES (1)
F/O PROBES (2)
STBY PROBES (3)

(1) *(If all CAPT PROBES heating is lost)*
(2) *(If all F/O PROBES heating is lost)*
(3) *(If all STBY PROBES heating is lost)*

A.ICE CAPT + F/O PITOT HEAT

Applicable to: ALL

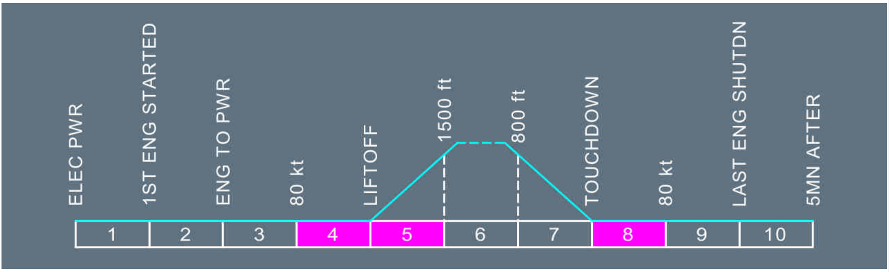
Ident.: PRO-ABN-A-ICE-R-00017302.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of the CAPT and F/O probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

A.ICE CAPT + F/O PITOT HEAT (Cont'd)

L2 In the case of simultaneous pitot icing and in the same amount, ADR 1 and ADR 2 speeds will be in agreement, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, sources.

L1 ● **If all probes heating is lost on the CAPT and/or F/O side:**

PROBE/WINDOW HEAT....................ON

L2 *In some failure conditions, probe heating may be recovered.*

L1 ● **IF UNSUCCESSFUL:**

■ **If ADR 3 operative and ON:**

ADR 1(2) P/B....................OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 2 be switched OFF.*

Note: In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the "ADR DISAGREE" ECAM caution will trigger.

L1 ■ **If ADR 3 failed or OFF:**

L2 No action is required, as long as there are no icing conditions, in order to keep two independent speed sources.

L1 ● **IF ICING EXPECTED:**

ADR 1(2) P/B....................OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 2 be switched OFF.*

L1 UNREL SPD PROC....................APPLY

L2 *Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items).*

L1

ASSOCIATED PROCEDURES

NAV ADR FAULT

Continued on the following page

A.ICE CAPT + F/O PITOT HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-R-00018794.0002001 / 21 MAR 16

STATUS

- **If ADR 3 failed or OFF:**
  - **IF ICING EXPECTED:**
    ADR 1(2) P/B..OFF
    UNREL SPD PROC.................................... APPLY

INOP SYS

CAPT PITOT
F/O PITOT
CAPT PROBES (1)
F/O PROBES (2)

(1) *(If all CAPT PROBES heating is lost)*
(2) *(If all F/O PROBES heating is lost)*

A.ICE CAPT + STBY PITOT HEAT

Applicable to: ALL

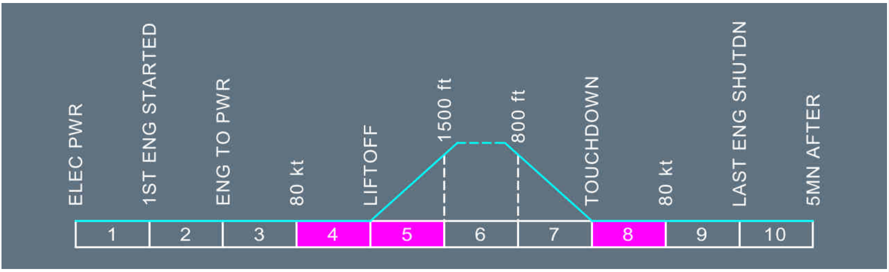
Ident.: PRO-ABN-A-ICE-S-00017303.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of the CAPT and STBY probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

A.ICE CAPT + STBY PITOT HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-S-00018820.0002001 / 07 JUN 16

L2 In the case of simultaneous pitot icing and in the same amount, ADR 1 and ADR 3 speeds will be in agreement, but incorrect. Flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, sources.

L1
- ● **If all probes heating is lost on the CAPT and/or STBY side:**

  PROBE/WINDOW HEAT...ON

L2 *In some failure conditions, probe heating may be recovered.*

L1
- ● **IF UNSUCCESSFUL:**
  - ■ **If ADR 2 operative and ON:**

    ADR 1(3) P/B...OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 3 be switched OFF.*

Note: *In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the “ADR DISAGREE” ECAM caution will trigger.*

L1
  - ■ **If ADR 2 failed or OFF:**

L2 No action is required, as long as there are no icing conditions, in order to keep two independent speed sources.

L1
    - ● **IF ICING EXPECTED:**

      ADR 1(3) P/B...OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 1 or 3 be switched OFF.*

L1 UNREL SPD PROC...APPLY

L2 *Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items).*

L1

ASSOCIATED PROCEDURES

NAV ADR FAULT

Continued on the following page

A.ICE CAPT + STBY PITOT HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-S-00018821.0002001 / 21 MAR 16

STATUS

	INOP SYS
● **If ADR 2 failed or OFF:** ● **IF ICING EXPECTED:** ADR 1(3) P/B....................OFF UNREL SPD PROC ....APPLY	CAPT PITOT STBY PITOT CAPT PROBES (1) STBY PROBES (2)

(1) *(If all CAPT PROBES heating is lost)*
(2) *(If all STBY PROBES heating is lost)*

A.ICE F/O + STBY PITOT HEAT

Applicable to: ALL

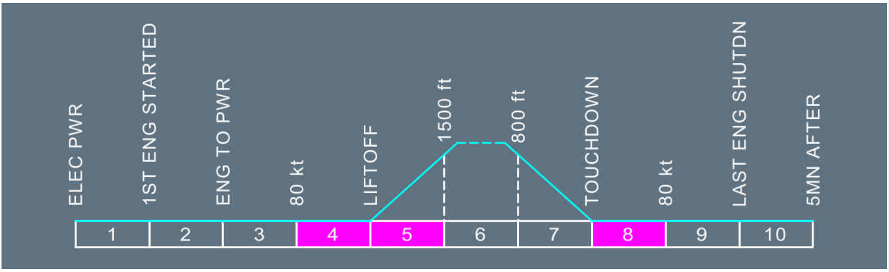
Ident.: PRO-ABN-A-ICE-T-00017304.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the heating systems of the F/O and STBY probes are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

A.ICE F/O + STBY PITOT HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-T-00018826.0002001 / 07 JUN 16

L2 In the case of simultaneous pitot icing and in the same amount, ADR 2 and ADR 3 speeds will be in agreement, but incorrect. Therefore, flight controls will consider the remaining correct source as being faulty, and will reject the only correct source. The following ECAM procedure avoids that the flight controls use two erroneous, but coherent, sources.

L1 ● **If all probes heating is lost on the F/O and/or STBY side:**

PROBE/WINDOW HEAT....................ON

L2 *In some failure conditions, probe heating may be recovered.*

L1 ● **IF UNSUCCESSFUL:**

■ **If ADR 1 operative and ON:**

ADR 2(3) P/B....................OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.*

Note: *In the case of subsequent, significant, speed discrepancy between the two remaining ADRs, the “ADR DISAGREE” ECAM caution will be triggered.*

L1 ■ **If ADR 1 failed or OFF:**

L2 No action is required, as long as there are no icing conditions, in order to keep two independent speed sources.

L1 ● **IF ICING EXPECTED:**

ADR 2(3) P/B....................OFF

L2 *Depending on the status of the static, AOA, and TAT heating, the ECAM requires that either ADR 2 or 3 be switched OFF.*

L1 UNREL SPD PROC....................APPLY

L2 *Only one ADR is available, and the corresponding pitot probe may be affected by ice accretion. Be prepared to use the UNRELIABLE SPEED INDICATION procedure (Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items).*

L1

ASSOCIATED PROCEDURES

NAV ADR FAULT

Continued on the following page

A.ICE F/O + STBY PITOT HEAT (Cont'd)

Ident.: PRO-ABN-A-ICE-T-00018827.0002001 / 21 MAR 16

STATUS

- **If ADR 1 failed or OFF:**
  - **IF ICING EXPECTED:**
    ADR 2(3) P/B..OFF
    UNREL SPD PROC.. APPLY

INOP SYS

F/O PITOT
STBY PITOT
F/O PROBES (1)
STBY PROBES (2)

(1) *(If all F/O PROBES heating is lost)*
(2) *(If all STBY PROBES heating is lost)*

[QRH] BLEED 1+2 FAULT (APU BLEED ON)

Ident.: PRO-ABN-AIR-00014558.0004001 / 27 FEB 18
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Apply this procedure when both engine bleed supply systems are failed at the end of the AIR ENG 1+2 BLEED FAULT ECAM procedure and if the APU bleed supplies the aircraft.

- **At ANY TIME of the procedure, if CAB PR EXCESS CAB ALT alert triggers:** APPLY ECAM PROC

MONITOR CABIN PRESSURE
MAX FL: 220
AVOID ICING CONDITIONS
RCL pb.......PRESS

This action enables to recover the subtitle (if any) associated with the AIR ENG 1+2 BLEED FAULT alert.

- **If no subtitle with AIR ENG 1+2 BLEED FAULT alert**
  and
  If both engine bleeds lost NOT due to engine fire NOR Start Air Valve failed open:
  PACK 1.......ON
  PACK 2.......ON
  ENG 1 BLEED.......ON
  ENG 2 BLEED.......ON
  APU BLEED.......OFF
  - **If no engine bleed recovered:**
    APU BLEED.......ON
    - **If PACK 1 available:**
      PACK 2.......OFF

    ENG 1 BLEED.......OFF
    ENG 2 BLEED.......OFF
    WING A.ICE NOT AVAILABLE
- **If RIGHT LEAK or BLEED 2 NOT CLOSED subtitle with AIR ENG 1+2 BLEED FAULT alert**
  or
  If engine 2 bleed lost due to engine 2 fire or Start Air Valve 2 failed open:
  PACK 1.......ON
  ENG 1 BLEED.......ON
  APU BLEED.......OFF

Continued on the following page

[QRH] BLEED 1+2 FAULT (APU BLEED ON) (Cont'd)

- **If engine 1 bleed not recovered:**

  APU BLEED............ON

  ENG 1 BLEED............OFF

  WING A.ICE NOT AVAILABLE

[QRH] BLEED 1+2 RESET (APU BLEED ON)

Ident.: PRO-ABN-AIR-00014558.0001001 / 27 FEB 18
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Apply this procedure when both engine bleed supply systems are failed at the end of the AIR ENG 1+2 BLEED FAULT ECAM procedure and if the APU bleed supplies the aircraft.

- **At ANY TIME of the procedure, if CAB PR EXCESS CAB ALT alert triggers:** APPLY ECAM PROC

MONITOR CABIN PRESSURE
MAX FL: 220
AVOID ICING CONDITIONS
RCL pb........PRESS

This action enables to recover the subtitle (if any) associated with the AIR ENG 1+2 BLEED FAULT alert.

- **If no subtitle with AIR ENG 1+2 BLEED FAULT alert**
  and
  If both engine bleeds lost NOT due to engine fire NOR Start Air Valve failed open:
  PACK 1........ON
  PACK 2........ON
  ENG 1 BLEED........ON
  ENG 2 BLEED........ON
  APU BLEED........OFF
  - **If no engine bleed recovered:**
    APU BLEED........ON
    - **If PACK 1 available:**
      PACK 2........OFF

    ENG 1 BLEED........OFF
    ENG 2 BLEED........OFF
    WING A.ICE NOT AVAILABLE
- **If RIGHT LEAK subtitle with AIR ENG 1+2 BLEED FAULT alert**
  or
  If engine 2 bleed lost due to engine 2 fire or Start Air Valve 2 failed open:
  PACK 1........ON
  ENG 1 BLEED........ON
  APU BLEED........OFF

Continued on the following page

[QRH] BLEED 1+2 RESET (APU BLEED ON) (Cont'd)

- **If engine 1 bleed not recovered:**
  APU BLEED..ON
  ENG 1 BLEED..OFF
  WING A.ICE NOT AVAILABLE

[QRH] BLEED 1+2 FAULT (APU BLEED NOT AVAILABLE)

Ident.: PRO-ABN-AIR-00014559.0004001 / 27 FEB 18
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Apply this procedure when both engine bleed supply systems are failed at the end of the AIR ENG 1+2 BLEED FAULT ECAM procedure and if the APU bleed is NOT available to supply the aircraft.

- **At ANY TIME of the procedure, if CAB PR EXCESS CAB ALT alert triggers:** APPLY ECAM PROC

MAX FL: 100 / MEA-MORA
AVOID ICING CONDITIONS
RCL pb.. PRESS

This action enables to recover the subtitle (if any) associated with the AIR ENG 1+2 BLEED FAULT alert.

■ **If no subtitle with AIR ENG 1+2 BLEED FAULT alert**
and
If both engine bleeds lost NOT due to engine fire NOR Start Air Valve failed open NOR APU leak fed by engine:

PACK 1.. ON
PACK 2.. ON
ENG 1 BLEED.. ON
ENG 2 BLEED.. ON

- **If no engine bleed recovered:**
  ENG 1 BLEED.. OFF
  ENG 2 BLEED.. OFF

  WING A.ICE NOT AVAILABLE

  - **When CAB PR ΔP < 1 psi:**
    RAM AIR.. ON

■ **If both engine bleeds lost due to any of the following failures: Bleed failure (indicated by either LEFT LEAK and/or RIGHT LEAK and/or BLEED 1 NOT CLOSED and/or BLEED 2 NOT CLOSED subtitles) or engine fire or Start Air Valve failed open or APU leak fed by engine:**

NO ENGINE BLEED CAN BE RECOVERED

WING A.ICE NOT AVAILABLE

- **When CAB PR ΔP < 1 psi:**
  RAM AIR.. ON

Continued on the following page

[QRH] BLEED 1+2 FAULT (APU BLEED NOT AVAILABLE) (Cont'd)

- ■ **If LEFT LEAK or BLEED 1 NOT CLOSED subtitle with AIR ENG 1+2 BLEED FAULT alert**
  or
  If engine 1 bleed lost due to engine 1 fire or Start Air Valve 1 failed open or APU leak fed by engine:
  PACK 2..ON
  ENG 2 BLEED..ON
  - ● **If engine 2 bleed not recovered:**
    ENG 2 BLEED..OFF
    WING A.ICE NOT AVAILABLE
    - ● **When CAB PR ΔP < 1 psi:**
      RAM AIR..ON
- ■ **If RIGHT LEAK or BLEED 2 NOT CLOSED subtitle with AIR ENG 1+2 BLEED FAULT alert**
  or
  If engine 2 bleed lost due to engine 2 fire or Start Air Valve 2 failed open:
  PACK 1..ON
  ENG 1 BLEED..ON
  - ● **If engine 1 bleed not recovered:**
    ENG 1 BLEED..OFF
    WING A.ICE NOT AVAILABLE
    - ● **When CAB PR ΔP < 1 psi:**
      RAM AIR..ON

[QRH] BLEED 1+2 RESET (APU BLEED NOT AVAILABLE)

Ident.: PRO-ABN-AIR-00014559.0001001 / 27 FEB 18
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Apply this procedure when both engine bleed supply systems are failed at the end of the AIR ENG 1+2 BLEED FAULT ECAM procedure and if the APU bleed is NOT available to supply the aircraft.

- **At ANY TIME of the procedure, if CAB PR EXCESS CAB ALT alert triggers:** APPLY ECAM PROC

MAX FL: 100 / MEA-MORA
AVOID ICING CONDITIONS
RCL pb.......... PRESS

This action enables to recover the subtitle (if any) associated with the AIR ENG 1+2 BLEED FAULT alert.

■ **If no subtitle with AIR ENG 1+2 BLEED FAULT alert**
and
If both engine bleeds lost NOT due to engine fire NOR Start Air Valve failed open NOR APU leak fed by engine:

PACK 1.......... ON
PACK 2.......... ON
ENG 1 BLEED.......... ON
ENG 2 BLEED.......... ON

- **If no engine bleed recovered:**

  ENG 1 BLEED.......... OFF
  ENG 2 BLEED.......... OFF

  WING A.ICE NOT AVAILABLE

  - **When CAB PR ΔP < 1 psi:**

    RAM AIR.......... ON

■ **If both engine bleeds lost due to any of the following failures: Bleed leak (indicated by either LEFT LEAK and/or RIGHT LEAK subtitles) or engine fire or Start Air Valve failed open or APU leak fed by engine:**

NO ENGINE BLEED CAN BE RECOVERED

WING A.ICE NOT AVAILABLE

- **When CAB PR ΔP < 1 psi:**

  RAM AIR.......... ON

Continued on the following page

[QRH] BLEED 1+2 RESET (APU BLEED NOT AVAILABLE) (Cont'd)

■ **If LEFT LEAK subtitle with AIR ENG 1+2 BLEED FAULT alert**

or

If engine 1 bleed lost due to engine 1 fire or Start Air Valve 1 failed open or APU leak fed by engine:

PACK 2....................ON
ENG 2 BLEED....................ON

- ● **If engine 2 bleed not recovered:**

  ENG 2 BLEED....................OFF

  WING A.ICE NOT AVAILABLE

  - ● **When CAB PR ΔP < 1 psi:**

    RAM AIR....................ON

■ **If RIGHT LEAK subtitle with AIR ENG 1+2 BLEED FAULT alert**

or

If engine 2 bleed lost due to engine 2 fire or Start Air Valve 2 failed open:

PACK 1....................ON
ENG 1 BLEED....................ON

- ● **If engine 1 bleed not recovered:**

  ENG 1 BLEED....................OFF

  WING A.ICE NOT AVAILABLE

  - ● **When CAB PR ΔP < 1 psi:**

    RAM AIR....................ON

AIR ABNORM BLEED CONFIG (X BLEED CLOSED)

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

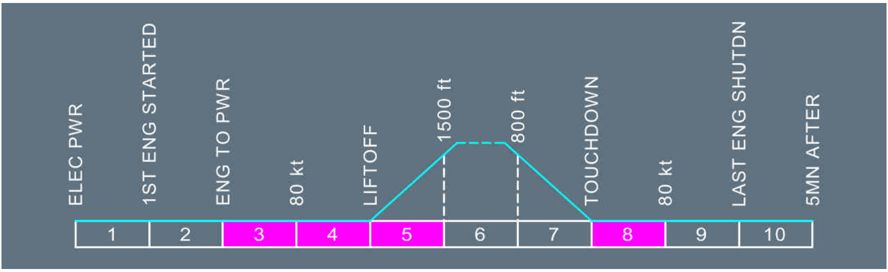
Ident.: PRO-ABN-AIR-E-00018720.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when at least one engine bleed fails, is OFF, or is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ABNORM BLEED CONFIG (X BLEED CLOSED) (Cont'd)

Ident.: PRO-ABN-AIR-E-00017700.0006001 / 27 FEB 18

- **If BLEED is abnormally selected OFF:**
  ENG 1(2) BLEED OFF

- **IF BLEED NOT RECOVERED:**
  X BLEED.......CLOSE

L2 *CLOSE, if:*
- *LEAK, or*
- *ENG FIRE (detected, or FIRE pushbutton pressed), or*
- *Engine start valve failed open, or*
- *Overpressure with the bleed valve failed open, or*
- *Overtemperature with the bleed valve failed open.*

L1
  - **In the case of engine bleed overtemperature and the associated engine bleed valve failed open:**
    PACK (AFFECTED SIDE).......OFF

  WING A.ICE.......OFF
  AVOID ICING CONDITIONS

  - **IF SEVERE ICE ACCRETION**
    MIN SPD.......VLS +10/G DOT
    MANEUVER WITH CARE

L2 *Note:* *APU BLEED pb-sw must not be used for wing anti-ice purpose, or after ENG 1 FIRE.*

Continued on the following page

AIR ABNORM BLEED CONFIG (X BLEED CLOSED) (Cont'd)

Ident.: PRO-ABN-AIR-E-00017701.0005001 / 12 JUL 18

L12

STATUS

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**

  MIN SPD..VLS + 10/G DOT

  Note: The speed must not be lower than :
  - *G DOT, when in CONF 0*
  - *VLS +10 kt for other configurations.*

  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION**

  FOR LDG..USE FLAP 3

  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

  APPR SPD..VLS + 10 KT

  LDG DIST PROC..APPLY

INOP SYS

WING A. ICE
ENG 1(2) BLEED
PACK 1(2)
FWD CRG TEMP ◁

AIR ABNORM BLEED CONFIG (X BLEED CLOSED)

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

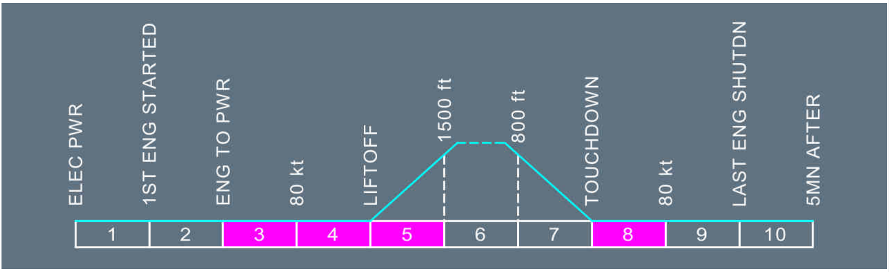
Ident.: PRO-ABN-AIR-E-00018720.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when at least one engine bleed fails, is OFF, or is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ABNORM BLEED CONFIG (X BLEED CLOSED) (Cont'd)

Ident.: PRO-ABN-AIR-E-00017700.0003001 / 21 MAR 16

- **If BLEED is abnormally selected OFF:**
  ENG 1(2) BLEED OFF
- **IF BLEED NOT RECOVERED**
  X BLEED...CLOSE

L2 *CLOSE, if:*
- *LEAK, or*
- *ENG FIRE (detected, or FIRE pushbutton pressed), or*
- *Engine start valve failed open, or*
- *Overpressure with bleed valve failed open.*

L1 WING A.ICE...OFF

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**
  MIN SPD...VLS +10/G DOT
  MANEUVER WITH CARE

L2 *Note:* *APU BLEED pb-sw must not be used for wing anti-ice purpose, or after ENG 1 FIRE.*

Continued on the following page

AIR ABNORM BLEED CONFIG (X BLEED CLOSED) (Cont'd)

Ident.: PRO-ABN-AIR-E-00017701.0003001 / 21 MAR 16

STATUS

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**

  MIN SPD...VLS + 10/G DOT

  Note: The speed must not be lower than :
  - *G DOT, when in CONF 0*
  - *VLS +10 kt for other configurations.*

  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION**

  APPR SPD... VLS + 10 KT
  LDG DIST PROC..APPLY

INOP SYS

WING A. ICE
ENG 1(2) BLEED
PACK 1(2)
FWD CRG TEMP ◁

AIR ABNORM BLEED CONFIG (X BLEED OPEN)

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

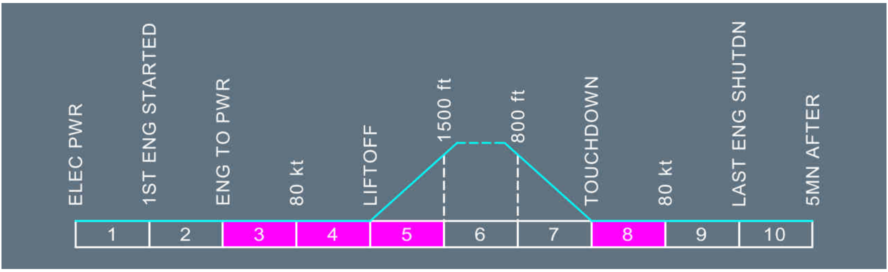
Ident.: PRO-ABN-AIR-D-00018721.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when at least one engine bleed fails, is OFF, or is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ABNORM BLEED CONFIG (X BLEED OPEN) (Cont'd)

Ident.: PRO-ABN-AIR-D-00017704.0003001 / 26 OCT 18

- **If BLEED is abnormally selected OFF:**
  ENG 1 (2) BLEED OFF
- **IF BLEED NOT RECOVERED:**
  X BLEED....................OPEN

L2 *OPEN, if:*
- *No LEAK, and*
- *No ENG FIRE (detected, or FIRE pushbutton pressed), and*
- *No engine start valve failed open, and*
- *No overpressure with the bleed valve failed open, and*
- *No overtemperature with the bleed valve failed open.*

L1
- **If WING A.ICE OFF, and no engine failed:**
  PACK FLOW....................LO

L2 *Pack flow is limited to 80 %.*

L1 FWD CRG COOLING ◁✻ ....OFF

- **If WING A.ICE ON or one engine failed:**
  PACK (AFFECTED SIDE IF OPPOSITE PACK HEALTHY)....................OFF

Ident.: PRO-ABN-AIR-D-00017706.0001001 / 21 MAR 16

STATUS

ONE PACK ONLY IF WAI ON

INOP SYS

ENG 1(2) BLEED
FWD CRG TEMP ◁✻
PACK 1(2) (If selected OFF)

AIR ABNORM BLEED CONFIG (X BLEED OPEN)

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

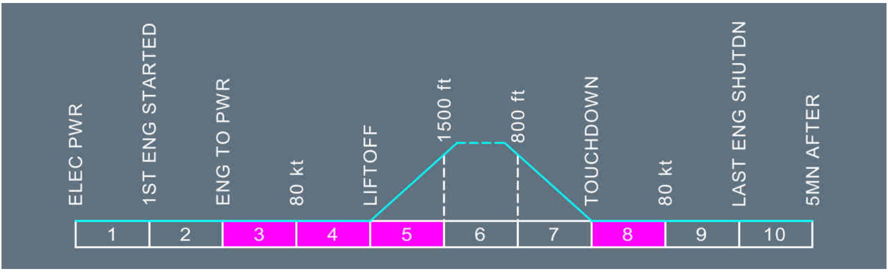
Ident.: PRO-ABN-AIR-D-00018721.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when at least one engine bleed fails, is OFF, or is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ABNORM BLEED CONFIG (X BLEED OPEN) (Cont'd)

Ident.: PRO-ABN-AIR-D-00017704.0001001 / 26 OCT 18

- **If BLEED is abnormally selected OFF:**
  ENG 1 (2) BLEED OFF
- **IF BLEED NOT RECOVERED**
  X BLEED..OPEN

L2 *OPEN, if:*
- *No leak, and*
- *No ENG FIRE (detected, or FIRE pushbutton pressed), and*
- *No engine start valve failed open, and*
- *No overpressure with bleed valve failed open.*

L1
- **If WING A.ICE OFF, and no engine failed:**
  PACK FLOW..LO

L2 *Pack flow is limited to 80 %.*

L1 FWD CRG COOLING ❄ ....OFF

- **If WING A.ICE ON or one engine failed:**
  PACK (AFFECTED SIDE IF OPPOSITE PACK HEALTHY)..OFF

Ident.: PRO-ABN-AIR-D-00017706.0001001 / 21 MAR 16

STATUS

	INOP SYS
ONE PACK ONLY IF WAI ON	ENG 1(2) BLEED FWD CRG TEMP ❄ PACK 1(2) (If selected OFF)

AIR APU BLEED FAULT

Applicable to: ALL

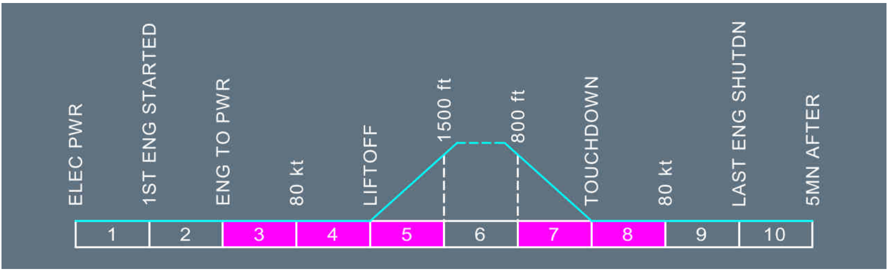
Ident.: PRO-ABN-AIR-K-00017312.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the APU is running and the position of the APU bleed valve disagrees with the selected position of the APU BLEED pb-sw.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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10

Ident.: PRO-ABN-AIR-K-00017718.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AIR-K-00011582.0001001 / 17 AUG 10

STATUS

INOP SYS

APU BLEED (if valve closed)

AIR APU BLEED LEAK

Applicable to: LV-GKO, LV-GKP

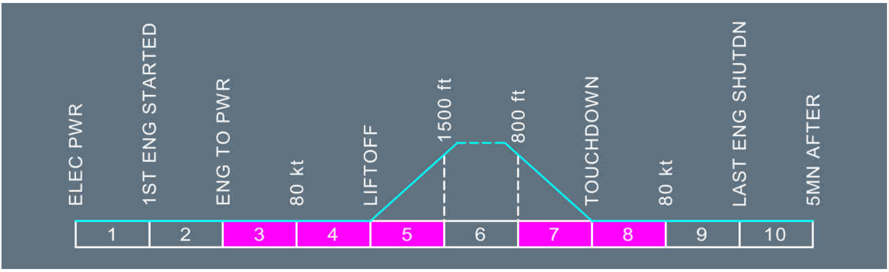
Ident.: PRO-ABN-AIR-I-00017313.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the APU bleed leak detection loop detects a temperature above 124 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-AIR-I-00017719.0004001 / 21 MAR 16

APU BLEED.. OFF

L2 *When the APU BLEED pb-sw is ON, the FAULT light remains on.*
When the APU BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

L1 ● **If the APU line leak is fed by an engine bleed:**

APU LEAK FED BY ENG

ENG 1 BLEED.. OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)*

Continued on the following page

AIR APU BLEED LEAK (Cont'd)

Ident.: PRO-ABN-AIR-I-00011600.0006001 / 17 AUG 10

STATUS

INOP SYS

ENG 1 BLEED
APU BLEED

AIR APU BLEED LEAK

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

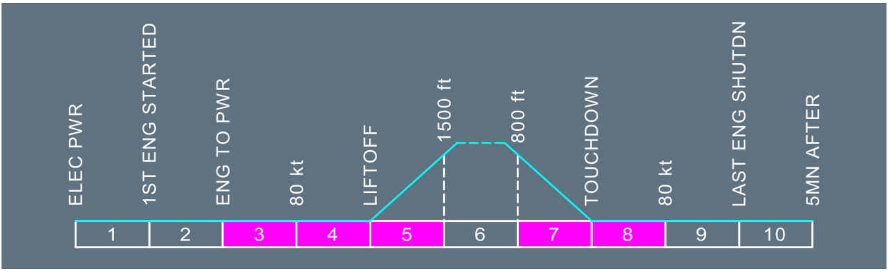
Ident.: PRO-ABN-AIR-I-00017313.0004001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both APU bleed leak detection loops detect a temperature above 124 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR APU BLEED LEAK (Cont'd)

Ident.: PRO-ABN-AIR-I-00017719.0004001 / 21 MAR 16

APU BLEED.. OFF

L2 *When the APU BLEED pb-sw is ON, the FAULT light remains on.*
When the APU BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

L1 ● **If the APU line leak is fed by an engine bleed:**

APU LEAK FED BY ENG

ENG 1 BLEED.. OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)*

Ident.: PRO-ABN-AIR-I-00011600.0006001 / 17 AUG 10

STATUS

INOP SYS

ENG 1 BLEED
APU BLEED

AIR APU LEAK DET FAULT

Applicable to: LV-GKO, LV-GKP

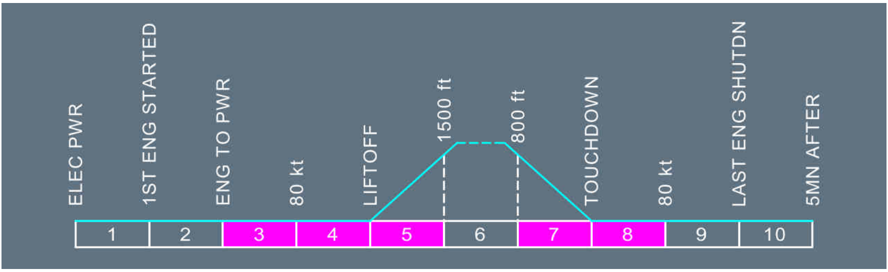
Ident.: PRO-ABN-AIR-R-00017321.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the APU bleed leak detection loop is inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-R-00011595.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AIR-R-00011596.0001001 / 17 AUG 10

STATUS

INOP SYS

APU LEAK DET

AIR APU LEAK DET FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

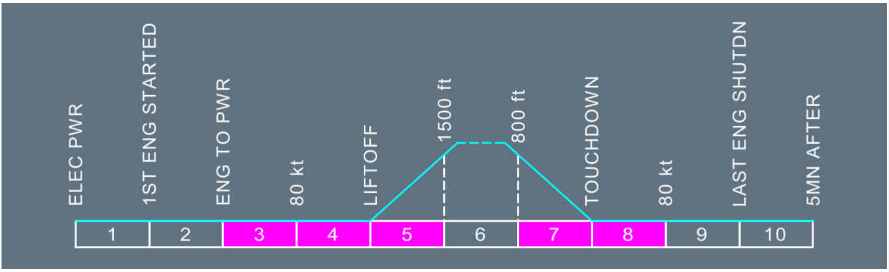
Ident.: PRO-ABN-AIR-R-00017321.0004001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both APU bleed leak detection loops are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-R-00011595.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AIR-R-00011596.0001001 / 17 AUG 10

STATUS

INOP SYS

APU LEAK DET

AIR BLEED LEAK

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

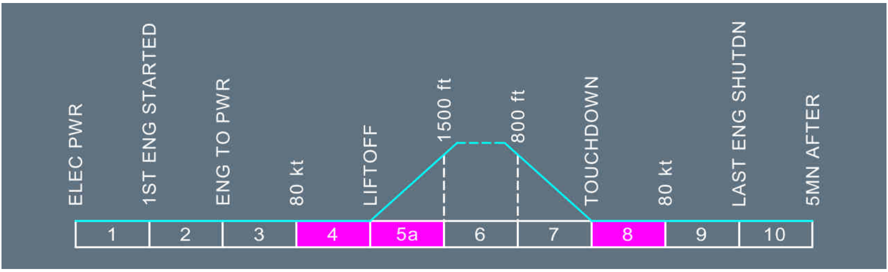
Ident.: PRO-ABN-AIR-T-00019412.0001001 / 09 FEB 18

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a leak is detected in a bleed duct and the X-BLEED selector is set to OPEN.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Note: *(a) Alert inhibited during the first 15 s of the flight phase 5.*

Ident.: PRO-ABN-AIR-T-00011601.0002001 / 30 JAN 18

X BLEED.. CLOSE

Ident.: PRO-ABN-AIR-T-00011602.0002001 / 30 JAN 18

STATUS

INOP SYS

ENG 1(2) BLEED
APU BLEED (1)
PACK 1(2)

(1) *(If left wing leak, or engine 1 bleed leak)*

AIR BLEED LO TEMP

Applicable to: ALL

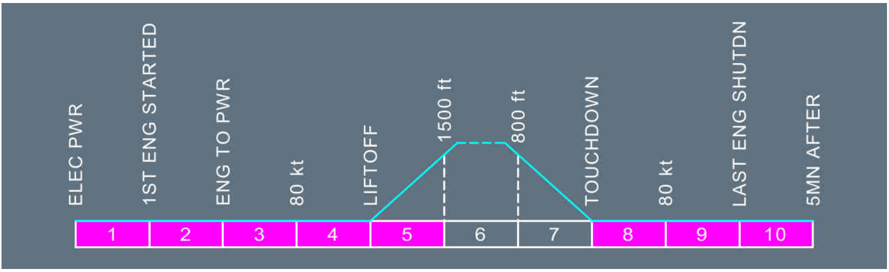
Ident.: PRO-ABN-AIR-S-00017315.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine bleed supplies bleed air at a temperature below 150 °C in flight and the WING A-ICE pb-sw is set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR BLEED LO TEMP (Cont'd)

Ident.: PRO-ABN-AIR-S-00011597.0010001 / 24 MAR 20

ON BLEED 1(2)

L2 *In flight, engine bleed temperature is too low for correct wing deicing.*

L1 ENG PWR...INCREASE

L2 *The thrust lever of the affected engine must be advanced with the autothrust OFF.*
Low bleed temperature may be due to low outside air temperature. Therefore, increasing engine thrust may increase bleed temperature and clear the ECAM caution.

L1
- ■ **If one BLEED affected:**
  - ● **IF UNSUCCESSFUL:**
    ENG BLEED (AFFECTED)..OFF
- ■ **If both BLEEDs affected:**
  WING ANTI ICE..OFF
  AVOID ICING CONDITIONS
  - ● **IF SEVERE ICE ACCRETION**
    MIN SPD...VLS +10/G DOT
    MANEUVER WITH CARE

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open) or
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

Continued on the following page

AIR BLEED LO TEMP (Cont'd)

Ident.: PRO-ABN-AIR-S-00017742.0002001 / 21 MAR 17

STATUS

- **If both BLEEDs LO TEMP:**

  AVOID ICING CONDITIONS

  - **IF SEVERE ICE ACCRETION:**

    MIN SPD.. VLS +10/G DOT

    Note: *The speed must not be lower than:*
    - *G DOT when in CONF 0*
    - *VLS + 10 kt for other configurations.*

    MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION:**

  APPR SPD..VLS +10 KT

  LDG DIST PROC..APPLY

INOP SYS

WING A. ICE
ENG 1(2) BLEED

AIR BMC 1(2) FAULT

Applicable to: ALL

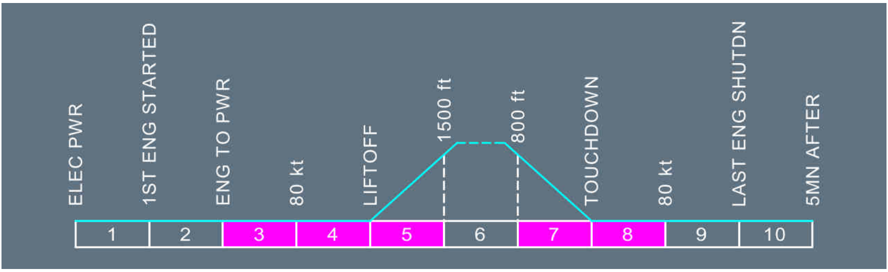
Ident.: PRO-ABN-AIR-N-00017318.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BMC 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-N-00011589.0002001 / 17 AUG 10

- **If APU bleed is selected ON:**
  ENG (AFFECTED) BLEED..........OFF
- **If APU bleed is selected OFF:**
  ENG (AFFECTED) BLEED..........ON

Ident.: PRO-ABN-AIR-N-00011590.0001001 / 17 AUG 10

STATUS

	INOP SYS
	BMC 1(2)

AIR ENG 1(2) BLEED FAULT

Applicable to: ALL

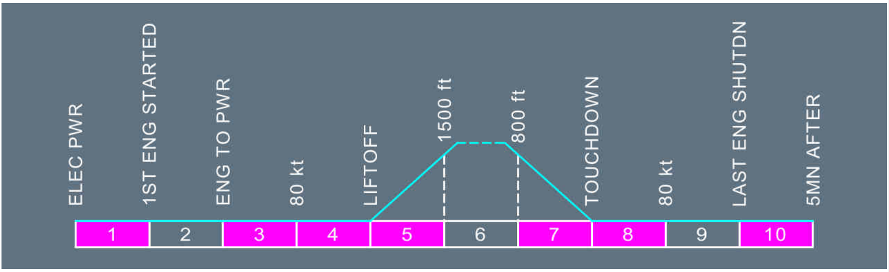
Ident.: PRO-ABN-AIR-B-00017326.0001001 / 01 JUN 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:
- The bleed air overheats, or
- The bleed air pressure is too low or too high.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-B-00017754.0002001 / 05 JUN 18

ENG BLEED (AFFECTED)....................OFF THEN ON

- **IF UNSUCCESSFUL:**

  ENG BLEED (AFFECTED)....................OFF

L2 *The FAULT light extinguishes when the failure disappears (overheat or overpressure).*
PACK FLOW is limited to 80 %.

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open), or
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

Continued on the following page

AIR ENG 1(2) BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-B-00011564.0001001 / 17 AUG 10

STATUS

INOP SYS

ENG 1 (2) BLEED

AIR ENG 1(2) BLEED FAULT
BLEED NOT CLOSED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

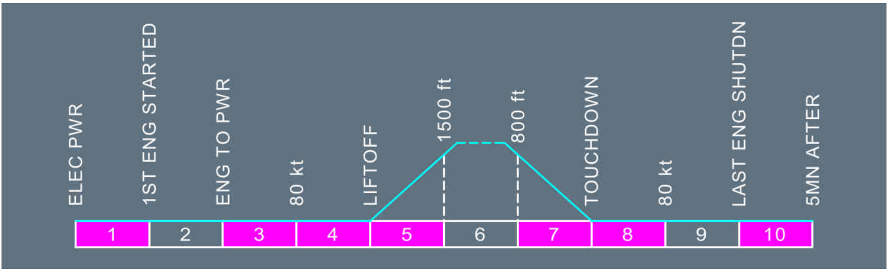
Ident.: PRO-ABN-AIR-AO-00021503.0001001 / 16 OCT 18

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers in the case of engine 1(2) bleed overtemperature with the associated engine bleed valve failed open.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ENG 1(2) BLEED FAULT (Cont'd)

BLEED NOT CLOSED

Ident.: PRO-ABN-AIR-AO-00021504.0001001 / 27 FEB 18

ENG BLEED (AFFECTED).. OFF

- **If engine 1 bleed affected:**
  APU BLEED.. OFF

ASSOCIATED PROCEDURES

AIR ABNORMAL BLEED CONFIG

Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed).

Ident.: PRO-ABN-AIR-AO-00021505.0001001 / 27 FEB 18

STATUS

INOP SYS

ENG 1(2) BLEED
APU BLEED (1)

(1) *(If engine 1 bleed affected)*

AIR ENG 1+2 BLEED FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

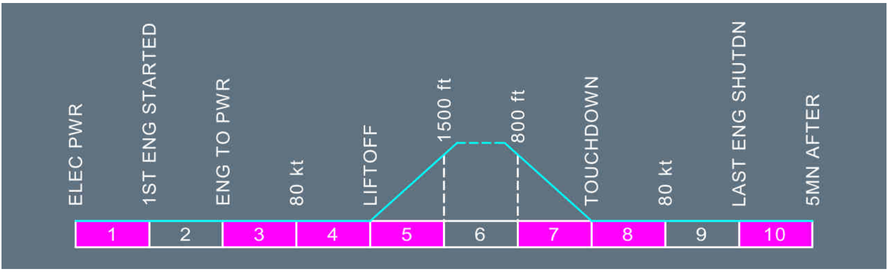
Ident.: PRO-ABN-AIR-AU-00021994.0003001 / 27 FEB 18

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both engine bleed supply systems are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AU-00021993.0009001 / 05 MAR 19

- **In the case of wing leak or pylon leak on both sides**
  or
  In the case of engine bleed overtemperature and the associated engine bleed valves failed open on both sides
  or
  In the case of wing leak or pylon leak on one side and an engine bleed overtemperature with the associated engine bleed valve failed open on the other side:

  LEFT LEAK

  RIGHT LEAK

  BLEED 1 NOT CLOSED

  BLEED 2 NOT CLOSED

  L2 *Out of the four above-mentioned ECAM subtitles, only two are displayed, depending on the failure.*

  L1 X BLEED.......................................CLOSE
  ENG 1 BLEED.......................................OFF
  ENG 2 BLEED.......................................OFF

  - **If APU Bleed is ON:**
    APU BLEED.......................................OFF

  DES TO FL 100/MEA-MORA

  - **In the case of engine 1 bleed overtemperature and the associated engine bleed valve failed open:**
    PACK 1.......................................OFF

  - **In the case of engine 2 bleed overtemperature and the associated engine bleed valve failed open:**
    PACK 2.......................................OFF

  ANTI ICE AUTO MODE ❄ ....OFF
  WING ANTI ICE.......................................OFF

  AVOID ICING CONDITIONS

  - **IF SEVERE ICE ACCRETION :**
    MIN SPD.......................................VLS +10/G DOT

    MANEUVER WITH CARE

  MAX FL.......................................100/MEA-MORA

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

APU BLEED.................................DO NOT USE
BLEED 1+2 PROC.................................APPLY

- **In the case of left wing leak or left pylon leak**
  or
  In the case of engine 1 bleed overtemperature and the associated engine bleed valve failed open:

  LEFT LEAK

  BLEED 1 NOT CLOSED

  L2 *Out of the two above-mentioned ECAM subtitles, only one is displayed, depending on the failure.*

  L1 X BLEED.................................CLOSE
  ENG 2 BLEED.................................OFF THEN ON

  - **IF UNSUCCESSFUL :**
    ENG 1 BLEED.................................OFF
    ENG 2 BLEED.................................OFF
    - **If APU Bleed is ON:**
      APU BLEED.................................OFF

    DES TO FL 100/MEA-MORA
    - **In the case of engine 1 bleed overtemperature and the associated engine bleed valve failed open:**
      PACK 1.................................OFF

    ANTI ICE AUTO MODE ....OFF
    WING ANTI ICE.................................OFF

    AVOID ICING CONDITIONS
    - **IF SEVERE ICE ACCRETION :**
      MIN SPD.................................VLS +10/G DOT

      MANEUVER WITH CARE

    MAX FL.................................100/MEA-MORA
    APU BLEED.................................DO NOT USE
    BLEED 1+2 PROC.................................APPLY

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

■ **In the case of right wing leak or right pylon leak**
or
In the case of engine 2 bleed overtemperature and the associated engine bleed valve failed open:

RIGHT LEAK

BLEED 2 NOT CLOSED

L2 *Out of the two above-mentioned ECAM subtitles, only one is displayed, depending on the failure.*

L1 X BLEED....................CLOSE
ENG 1 BLEED....................OFF THEN ON

- **IF UNSUCCESSFUL :**
  ENG 1 BLEED....................OFF
  ENG 2 BLEED....................OFF
  - **If APU Bleed is ON and fails:**
    APU BLEED....................OFF

L2 *Recall in the case of failure of the APU bleed.*

L1 DES TO FL 100/MEA-MORA
APU....................START

- **In the case of engine 2 bleed overtemperature and the associated engine bleed valve failed open:**
  PACK 2....................OFF

ANTI ICE AUTO MODE ❄ ....OFF
WING ANTI ICE....................OFF

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION :**
  MIN SPD....................VLS +10/G DOT

  MANEUVER WITH CARE

■ **If APU available:**

- **WHEN BELOW FL 220 AND APU AVAIL :**
  APU BLEED....................ON
  MAX FL....................220
  BLEED 1+2 PROC....................APPLY

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

- **If APU not available:**
  - MAX FL.................... 100/MEA-MORA
  - APU BLEED.................... DO NOT USE

    Displayed in the case of failure of the APU Bleed.
  - BLEED 1+2 PROC.................... APPLY
- **In all other cases:**
  - X BLEED.................... AUTO
  - ENG 1 BLEED.................... OFF THEN ON
  - ENG 2 BLEED.................... OFF THEN ON
  - ● **IF UNSUCCESSFUL :**
    - ENG 1 BLEED.................... OFF
    - ENG 2 BLEED.................... OFF
    - ● **If APU Bleed is ON and fails:**
      - APU BLEED.................... OFF

L2 *Recall in the case of failure of the APU Bleed.*

L1 DES TO FL 100/MEA-MORA

APU.................... START

PACK 2.................... OFF

ANTI ICE AUTO MODE ⧼❄ .... OFF

WING ANTI ICE.................... OFF

AVOID ICING CONDITIONS

- ● **IF SEVERE ICE ACCRETION :**
  - MIN SPD.................... VLS +10/G DOT
  - MANEUVER WITH CARE
- **If APU available:**
  - ● **WHEN BELOW FL 220 AND APU AVAIL :**
    - APU BLEED.................... ON
    - MAX FL.................... 220
    - BLEED 1+2 PROC.................... APPLY
- **If APU not available:**
  - MAX FL.................... 100/MEA-MORA
  - APU BLEED.................... DO NOT USE

    Displayed in the case of failure of the APU Bleed.

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

BLEED 1+2 PROC.. APPLY

Ident.: PRO-ABN-AIR-AU-00021995.0008001 / 05 MAR 19

STATUS

- **If APU Bleed ON:**
  MAX FL...220
- **If APU Bleed not available:**
  MAX FL.. 100/MEA-MORA

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**
  MIN SPD... VLS+10/G DOT
  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION:**
  APPR SPD...VLS +10 KT
  LDG DIST PROC...APPLY

INOP SYS

ENG 1 BLEED
ENG 2 BLEED
PACK 1 (1)
PACK 2 (2)
WING A. ICE
APU BLEED (3)
APU (If APU fault)

(1) *(In the case of engine bleed 1 overtemperature and the associated engine bleed valve failed open)*
(2) *(In the case of engine bleed 2 overtemperature and the associated engine bleed valve failed open)*
(3) *(If APU bleed not available)*

AIR ENG 1+2 BLEED FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

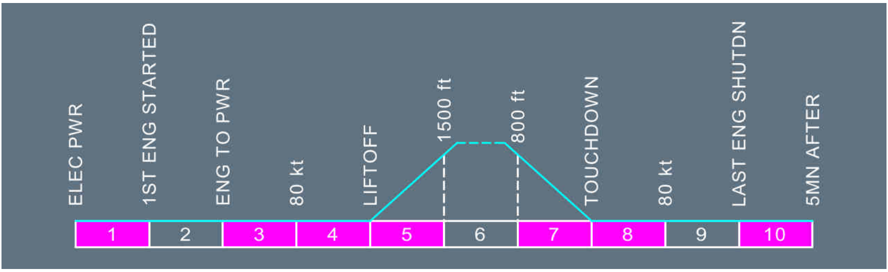
Ident.: PRO-ABN-AIR-AU-00021994.0003001 / 27 FEB 18

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both engine bleed supply systems are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AU-00021993.0004001 / 27 FEB 18

- **In the case of wing leak or pylon leak on both sides:**

  LEFT LEAK

  RIGHT LEAK

  X BLEED..........CLOSE
  ENG 1 BLEED..........OFF
  ENG 2 BLEED..........OFF

  - **If APU Bleed is ON:**

    APU BLEED..........OFF

  DES TO FL 100/MEA-MORA
  ANTI ICE AUTO MODE ❄ ....OFF
  WING ANTI ICE..........OFF

  AVOID ICING CONDITIONS

  - **IF SEVERE ICE ACCRETION :**

    MIN SPD..........VLS +10/G DOT

    MANEUVER WITH CARE

  MAX FL..........100/MEA-MORA
  BLEED 1+2 RST PROC..........APPLY

- **In the case of left wing leak or left pylon leak:**

  LEFT LEAK

  X BLEED..........CLOSE
  ENG 2 BLEED..........OFF THEN ON

  - **IF UNSUCCESSFUL :**

    ENG 1 BLEED..........OFF
    ENG 2 BLEED..........OFF

    - **If APU Bleed is ON:**

      APU BLEED..........OFF

    DES TO FL 100/MEA-MORA
    ANTI ICE AUTO MODE ❄ ....OFF
    WING ANTI ICE..........OFF

    AVOID ICING CONDITIONS

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

- **IF SEVERE ICE ACCRETION :**
  MIN SPD.......................................VLS +10/G DOT
  MANEUVER WITH CARE

MAX FL.......................................100/MEA-MORA
BLEED 1+2 RST PROC.......................................APPLY

- **In the case of right wing leak or right pylon leak:**

RIGHT LEAK
X BLEED.......................................CLOSE
ENG 1 BLEED.......................................OFF THEN ON

- **IF UNSUCCESSFUL :**
  ENG 1 BLEED.......................................OFF
  ENG 2 BLEED.......................................OFF
  - **If APU Bleed is ON and fails:**
    APU BLEED.......................................OFF

L2 *Recall in the case of failure of the APU bleed.*

L1 DES TO FL 100/MEA-MORA
APU.......................................START
ANTI ICE AUTO MODE ❄ ....OFF
WING ANTI ICE.......................................OFF
AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION :**
  MIN SPD.......................................VLS +10/G DOT
  MANEUVER WITH CARE
- **If APU available:**
  - **WHEN BELOW FL 220 AND APU AVAIL :**
    APU BLEED.......................................ON
    MAX FL.......................................220
    BLEED 1+2 RST PROC.......................................APPLY
- **If APU not available:**
  MAX FL.......................................100/MEA-MORA
  BLEED 1+2 RST PROC.......................................APPLY

- **In all other cases:**

X BLEED.......................................AUTO

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

ENG 1 BLEED .... OFF THEN ON
ENG 2 BLEED .... OFF THEN ON

- **IF UNSUCCESSFUL :**

  ENG 1 BLEED .... OFF
  ENG 2 BLEED .... OFF

  - **If APU Bleed is ON and fails:**

    APU BLEED .... OFF

L2 *Recall in the case of failure of the APU Bleed.*

L1 DES TO FL 100/MEA-MORA
APU .... START
PACK 2 .... OFF
ANTI ICE AUTO MODE ❄ .... OFF
WING ANTI ICE .... OFF

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION :**

  MIN SPD .... VLS +10/G DOT

  MANEUVER WITH CARE

■ **If APU available:**

- **WHEN BELOW FL 220 AND APU AVAIL :**

  APU BLEED .... ON
  MAX FL 220
  BLEED 1+2 RST PROC .... APPLY

■ **If APU not available:**

MAX FL 100/MEA-MORA
BLEED 1+2 RST PROC .... APPLY

Continued on the following page

AIR ENG 1+2 BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AU-00021995.0004001 / 27 FEB 18

STATUS

- **If APU Bleed ON:**
  MAX FL...220
- **If APU Bleed not available:**
  MAX FL..100/MEA-MORA

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**
  MIN SPD... VLS+10/G DOT
  MANEUVER WITH CARE

APPR PROC

- **IF SEVERE ICE ACCRETION:**
  APPR SPD...VLS +10 KT
  LDG DIST PROC..APPLY

INOP SYS

ENG 1 BLEED
ENG 2 BLEED
WING A. ICE
APU BLEED (1)
APU (If APU fault)

(1) *(If APU bleed not available)*

AIR ENG 1(2) BLEED HI TEMP

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

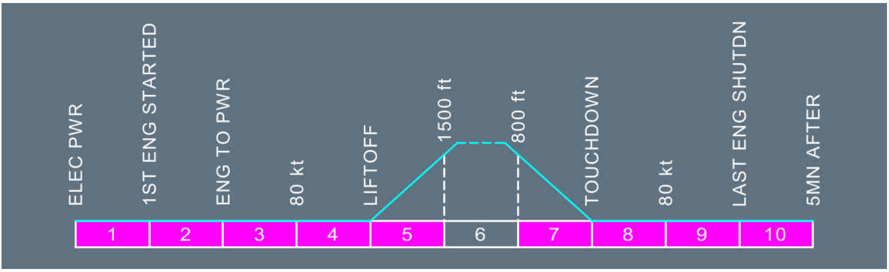
Ident.: PRO-ABN-AIR-AP-00022853.0004001 / 04 NOV 20

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the precooler outlet temperature is above 240 °C and when:
- The wing anti-ice is activated above FL 320, or
- The PACK FLOW selector is not in the LO position, or
- The cargo COOLING selector ❄ is in the MAX position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
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Ident.: PRO-ABN-AIR-AP-00022854.0009001 / 30 JUN 20

- **If two BLEEDS operative:**

  PACK FLOW .... LO
  CARGO COOLING ❄ .... NORM

  - **IF WARNING PERSISTS :**

    WING ANTI ICE .... OFF
    AVOID ICING CONDITIONS

- **If one BLEED inoperative:**

  PACK 2(1) .... OFF
  WING ANTI ICE .... OFF
  AVOID ICING CONDITIONS

Continued on the following page

AIR ENG 1(2) BLEED HI TEMP (Cont'd)

Ident.: PRO-ABN-AIR-AP-00022855.0004001 / 05 MAR 19

STATUS

AVOID ICING CONDITIONS

- **WHEN BELOW FL310:**
  WING A.ICE AVAIL

AIR ENG 1(2) BLEED LEAK

Applicable to: ALL

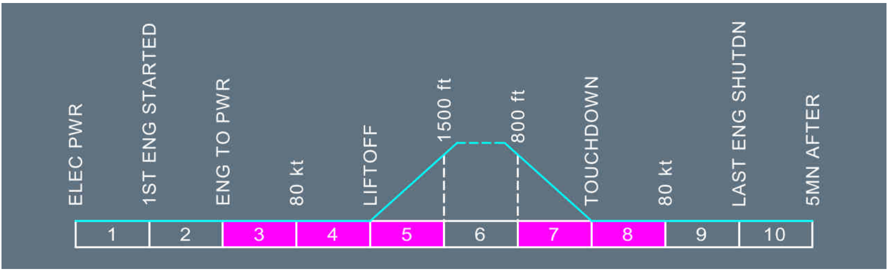
Ident.: PRO-ABN-AIR-U-00022366.0001001 / 04 JUN 19

ANNUNCIATIONS

Triggering Conditions:

L2 The AIR ENG 1(2) BLEED LEAK alert triggers when the pylon bleed leak detection loop detects a temperature above 204 °C and engine 1(2) is running.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR ENG 1(2) BLEED LEAK (Cont'd)

Ident.: PRO-ABN-AIR-U-00022367.0002001 / 04 NOV 20

ENG BLEED (AFFECTED SIDE)..OFF

L2 *When the ENG BLEED pb-sw is ON, the FAULT light remains on.*
When the ENG BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

L1 ● **If AIR ENG 1 BLEED LEAK:**
APU BLEED..OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)*

Ident.: PRO-ABN-AIR-U-00022370.0001001 / 04 JUN 19

STATUS

INOP SYS

ENG 1(2) BLEED
APU BLEED (1)

(1) *(If AIR ENG 1 BLEED LEAK)*

AIR ENG 1(2) BLEED NOT CLSD

Applicable to: ALL

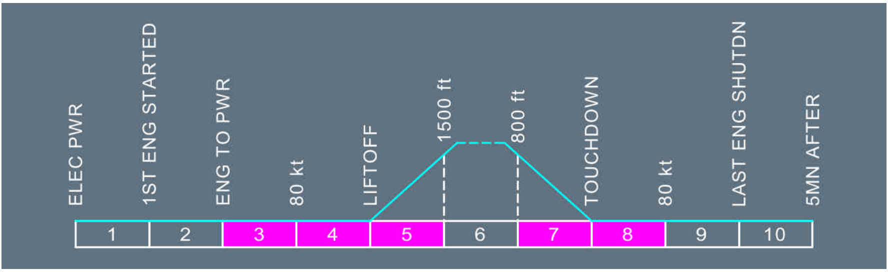
Ident.: PRO-ABN-AIR-Y-00017310.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine bleed valve is not automatically closed during the engine start or when the APU BLEED pb-sw is set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-AIR-Y-00017915.0001001 / 21 MAR 16

ENG BLEED (AFFECTED).. OFF

- **When engine start is completed, and APU BLEED pb-sw is deselected (automatic recall):**
  ENG BLEED (AFFECTED)..ON

AIR ENG 1(2) HPV NOT OPEN

Applicable to: ALL

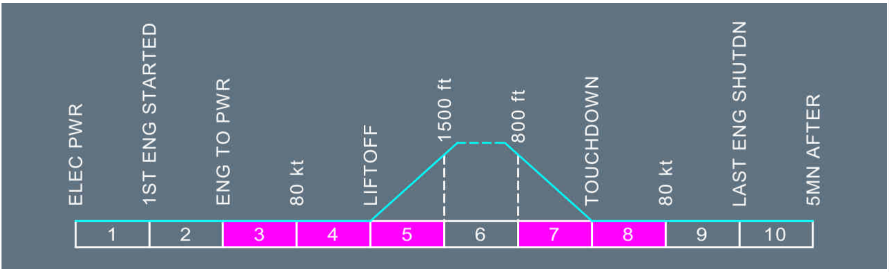
Ident.: PRO-ABN-AIR-J-00017316.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the HP valve is abnormally closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-J-00011579.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AIR-J-00011580.0001001 / 17 AUG 10

STATUS

NO BLEED 1 (2) AT LOW PWR

AIR HOT AIR SYS 1(2) FAULT

Applicable to: ALL

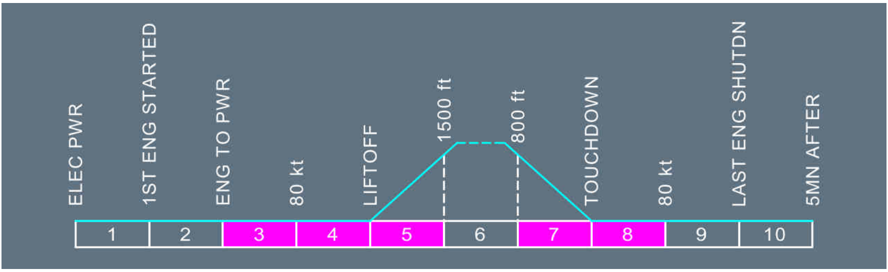
Ident.: PRO-ABN-AIR-AB-00017439.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the hot air 1(2) valve and the hot air cross-valve are failed closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-AB-00018160.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AIR-AB-00018163.0001001 / 21 MAR 16

STATUS

	INOP SYS
- **On ground:** CAB TEMP REGUL DEGRADED	CKPT TEMP (1) FWD CRG TEMP (2)

(1) *(Only if SYS 2 failed)*
(2) *(Only if SYS 1 failed)*

AIR L(R) WING LEAK

Applicable to: ALL

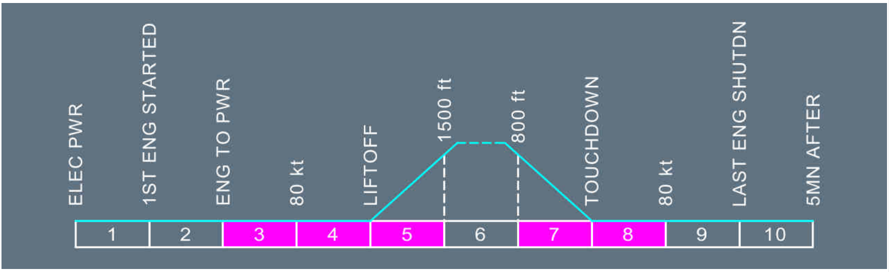
Ident.: PRO-ABN-AIR-H-00017329.0001001 / 04 JUN 19

ANNUNCIATIONS

Triggering Conditions:

L2 The AIR L(R) WING LEAK alert triggers when both wing bleed leak detection loops detect a temperature above 124 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-H-00017917.0003001 / 04 NOV 20

ENG BLEED (AFFECTED SIDE)..OFF

L2 *When the ENG BLEED pb-sw is ON, the FAULT light remains on.*
When the ENG BLEED pb-sw is OFF, the FAULT light goes off when the overheat disappears.

L1 ● **If AIR L WING LEAK:**
APU BLEED..OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)*

Continued on the following page

AIR L(R) WING LEAK (Cont'd)

Ident.: PRO-ABN-AIR-H-00017918.0001001 / 04 JUN 19

STATUS

INOP SYS

ENG 1(2) BLEED
APU BLEED (1)

(1) (If AIR L WING LEAK)

AIR L(R) WNG LEAK DET FAULT

Applicable to: ALL

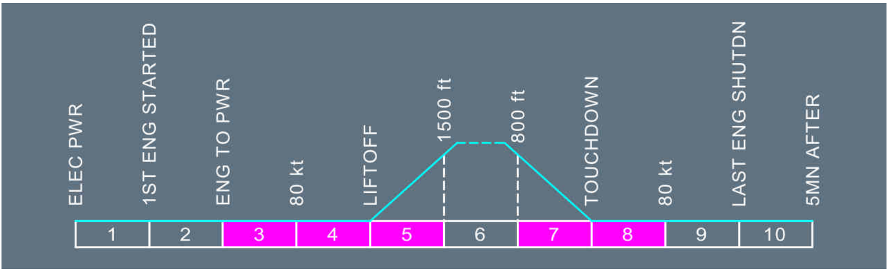
Ident.: PRO-ABN-AIR-L-00017320.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both wing bleed leak detection loops are inoperative in one wing.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-L-00011583.0001001 / 25 FEB 14

Crew awareness.

Continued on the following page

AIR L(R) WNG LEAK DET FAULT (Cont'd)

Ident.: PRO-ABN-AIR-L-00011584.0001001 / 17 AUG 10

STATUS

INOP SYS

L (R) LEAK DET

AIR PACK 1(2) OFF

Applicable to: ALL

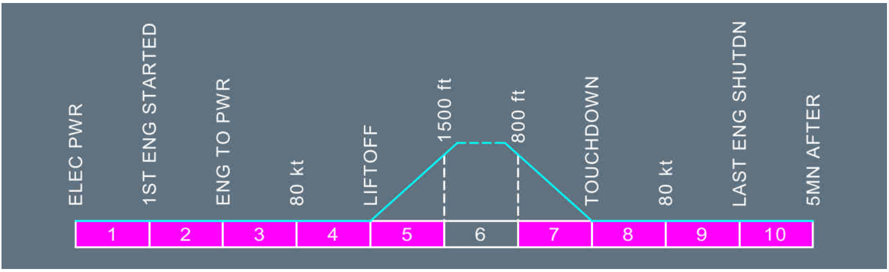
Ident.: PRO-ABN-AIR-AC-00017432.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the PACK 1(2) pb-sw is set to OFF and no failure is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-AC-00018170.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

AIR PACK 1(2) OFF (Cont'd)

Ident.: PRO-ABN-AIR-AC-00018171.0001001 / 21 MAR 16

STATUS

INOP SYS

PACK 1(2)
FWD CRG TEMP ◁❄

AIR PACK 1(2) OVHT

Applicable to: ALL

Ident.: PRO-ABN-AIR-AD-00017430.0001001 / 21 MAR 16

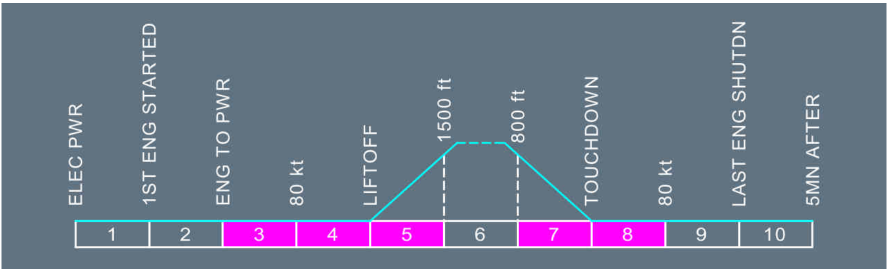
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when:
- The pack compressor outlet temperature rises above 260 °C, or
- The pack compressor outlet temperature rises above 230 °C four times during the same flight, or
- The pack outlet temperature rises above 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR PACK 1(2) OVHT (Cont'd)

Ident.: PRO-ABN-AIR-AD-00018438.0001001 / 06 SEP 16

PACK (AFFECTED).. OFF

L2 *High flow is automatically selected on the remaining pack.*
The fault light goes off when the overheat disappears.

L1
- **If the automatic closure of the cargo cooling cold air valve is not operative:**
  FWD CRG COOLING ◁✻ .... OFF
- **WHEN PACK OVHT OUT:**
  PACK (AFFECTED).. ON
  - **If the automatic closure of the cargo cooling cold air valve is not operative:**
    FWD CRG COOLING ◁✻ .... ON

Ident.: PRO-ABN-AIR-AD-00018439.0001001 / 21 MAR 16

STATUS

- **WHEN PACK OVHT OUT :**
  PACK (AFFECTED).. ON
  - **If the automatic closure of the cargo cooling cold air valve is not operative:**
    FWD CRG COOLING ◁✻ .... ON

INOP SYS

PACK 1(2)
FWD CRG TEMP ◁✻

AIR PACK 1(2) REGUL FAULT
(PACK CONTROLLER FAULT)

Applicable to: ALL

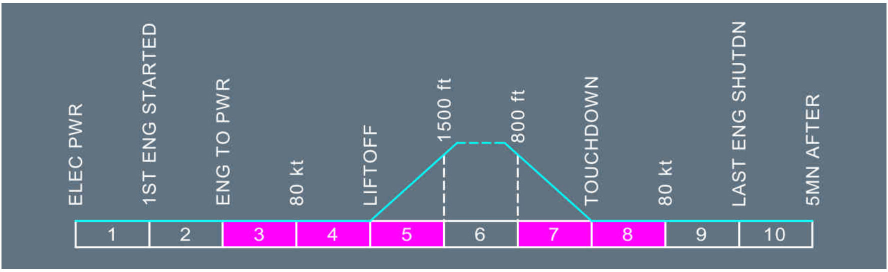
Ident.: PRO-ABN-AIR-AE-00018940.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pack controller is failed or the air is only cooled by the heat exchanger.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-AE-00010933.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-AIR-AE-00010934.0002001 / 05 MAY 14

L12

STATUS

PACK 1(2) AT FIXED TEMP

See (1)

(1) *The pack delivers a fixed temperature of 12 °C ± 3 °C.*
The flow control valve pneumatically regulates the flow to the High flow setting.

AIR PACK 1(2) REGUL FAULT
(PACK IN BYPASS MODE)

Applicable to: ALL

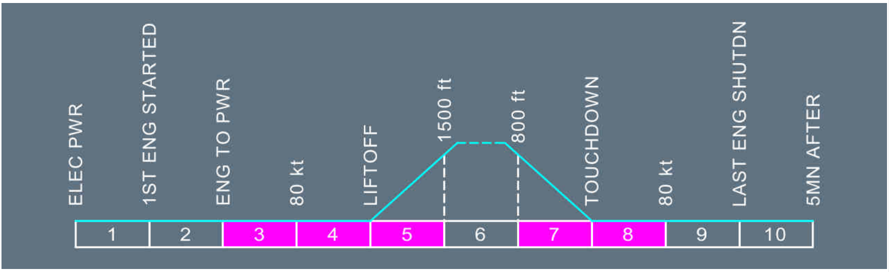
Ident.: PRO-ABN-AIR-AF-00017434.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the air cycle machine is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-AF-00018172.0001001 / 21 MAR 16

PACK 1(2) IN BY PASS MODE

- **On ground:**

  PACK (AFFECTED)..OFF

L2 *To avoid overheating on ground.*

L1 PACK (AFFECTED) AVAIL IN FLT

Ident.: PRO-ABN-AIR-AF-00018174.0001001 / 21 MAR 16

STATUS

	INOP SYS
PACK PERF AFFECTED	PACK 1(2) (On ground)

AIR PACK 1(2) REGUL FAULT
(RAM AIR DOOR FAILED CLOSED)

Applicable to: ALL

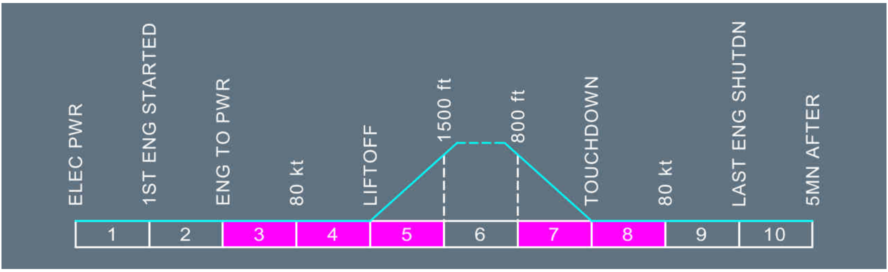
Ident.: PRO-ABN-AIR-AG-00018941.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pack ram air inlet or outlet door is failed closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-AG-00010931.0001001 / 17 AUG 10

PACK 1(2) RAM DOOR CLOSED

Ident.: PRO-ABN-AIR-AG-00010932.0001001 / 17 AUG 10

STATUS

PACK PERF AFFECTED

AIR PACK 1+2 FAULT

Applicable to: ALL

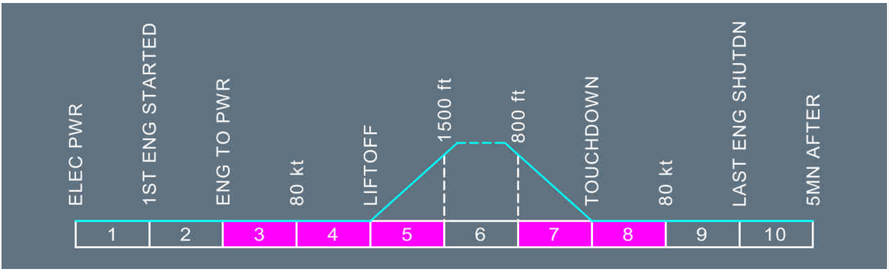
Ident.: PRO-ABN-AIR-AI-00017433.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one pack is off, and the other is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR PACK 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AI-00010929.0002001 / 21 MAR 17

- **If one door not locked closed on ground:**

  PACKS INHIB BY DOORS

  L2 *Check doors locked closed. If confirmed closed, maintenance action is due.*

L1
- **In all other cases:**

  PACK (AFFECTED)..OFF

  L2 *The fault light goes off when the failure disappears.*

  L1 DESCENT TO FL 100/MEA-MORA

  L2 *Note: The rate at which the cabin altitude increases may be minimized by closing the CARGO ISOL VALVES, if the cargo freight permits.*

  L1
  - **WHEN PACK OVHT OUT:**

    L2 If the FAULT was due to an overheat:

    L1 PACK (AFFECTED)..ON

  - **WHEN DIFF PR < 1 PSI AND FL BELOW 100:**

    RAM AIR..ON

    MAX FL..100/MEA-MORA

Ident.: PRO-ABN-AIR-AI-00018169.0007001 / 21 MAR 16

STATUS

MAX FL..100/MEA-MORA

- **If the failure is due to an overheat:**
  - **WHEN PACK OVHT OUT:**

    PACK (AFFECTED)..ON

    - **If the zone controller information is lost for the Ventilation Controller:**

      FWD CRG COOLING ❄ ....ON

INOP SYS

PACK 1+2
FWD CRG COND ❄
AFT CRG COND ❄

AIR PACK VALVE 1(2) FAULT

Applicable to: ALL

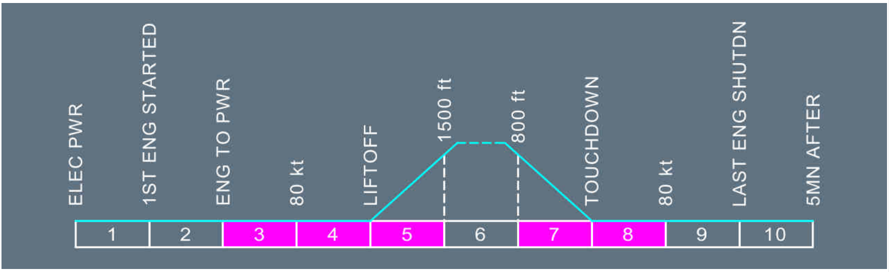
Ident.: PRO-ABN-AIR-AJ-00017431.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the position of the pack flow control valve disagrees with the selected position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AIR-AJ-00018167.0001001 / 21 MAR 16

- **If only one PACK VALVE closed (on ground at engine start):**

  PACK (affected) INHIB BY DOORS

  L2 *In case of prevention of pressurization due to one door not closed, only one pack valve is closed. The valve of the other pack stays abnormally in the OPEN position.*

  L1
  - **If the automatic closure of the cargo cooling cold air valve is not operative:**

    FWD CRG COOLING ❄ .... OFF

- **In all other cases:**

  PACK (AFFECTED).. OFF

  - **If the automatic closure of the cargo cooling cold air valve is not operative:**

    FWD CRG COOLING ❄ .... OFF

Continued on the following page

AIR PACK VALVE 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-AIR-AJ-00018168.0001001 / 21 MAR 16

STATUS

INOP SYS

PACK 1(2)
FWD CRG TEMP

AIR X BLEED FAULT

Applicable to: ALL

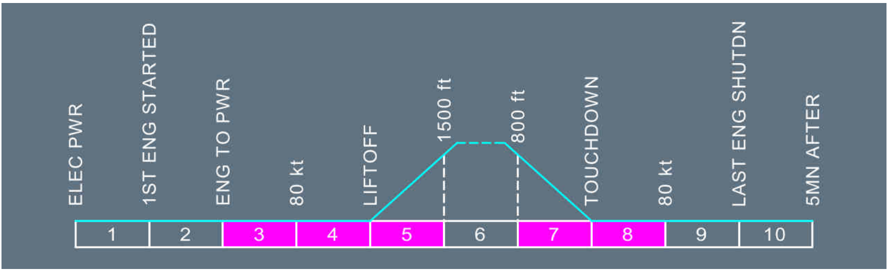
Ident.: PRO-ABN-AIR-M-00017314.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the crossbleed valve position disagrees with the X-BLEED selector position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AIR X BLEED FAULT (Cont'd)

Ident.: PRO-ABN-AIR-M-00011585.0001001 / 21 MAR 16

X BLEED.. MAN CTL

L2 *Select OPEN, when the APU BLEED pb-sw is ON, or for engine start, or when WING ANTI-ICE pb-sw is ON with one bleed inoperative.*

L1 ● **If manual opening is inoperative, and one BLEED is off:**

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)*

Ident.: PRO-ABN-AIR-M-00011586.0001001 / 17 AUG 10

STATUS

	INOP SYS
AIR X BLEED: MAN CTL	AIR X BLEED (If closed)

APU FAULT

Applicable to: ALL

Ident.: PRO-ABN-APU-A-00017199.0001001 / 21 MAR 16

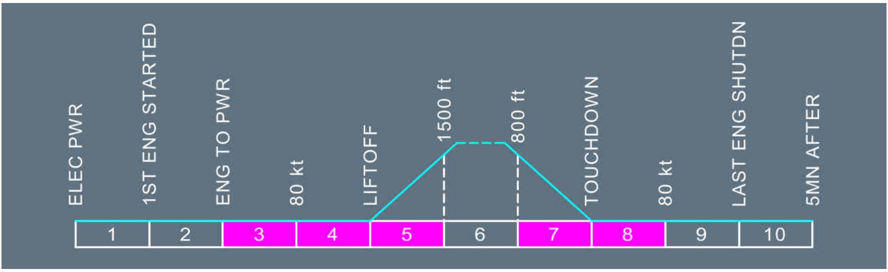
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one of the following situations has occurred:

1. An APU emergency shutdown.
L3 An APU emergency shutdown will occur, if:
   - APU FIRE pb is pressed, or
   - APU SHUT OFF sw on the External Power Panel is pressed, or
   - APU EMER SHUT DOWN sw on the Refuel/Defuel Panel is pressed.
2. L2 An APU automatic shutdown.
L3 An APU automatic shutdown will occur, if:
   - The APU is in overspeed mode, or
   - In some critical situations the ECB is internally failed.
3. L2 Non-Automatic shutdown of the APU. (*Refer to DSC-49-10-20 Operation Under Failure Conditions*)

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

APU FAULT (Cont'd)

Ident.: PRO-ABN-APU-A-00018630.0001001 / 05 MAY 22

- **EMER SHUT DOWN**
  MASTER SW.. OFF

- **AUTO SHUT DOWN**
  MASTER SW.. OFF

L2 *APU restart can be considered. After three consecutive APU start attempts, the flight crew must wait 60 min before a new start attempt.*

L1 - **Non automatic APU shut down:**

L2 The APU remains available.

L1 Shut down the APU manually, except if it is required in flight for electrical or pneumatic purposes.

● **IF USE NOT ESSENTIAL:**
MASTER SW.. OFF

Ident.: PRO-ABN-APU-A-00009922.0001001 / 05 AUG 10

STATUS

INOP SYS

APU

APU FIRE DET FAULT

Applicable to: ALL

Ident.: PRO-ABN-APU-B-00020744.0001001 / 17 MAR 17

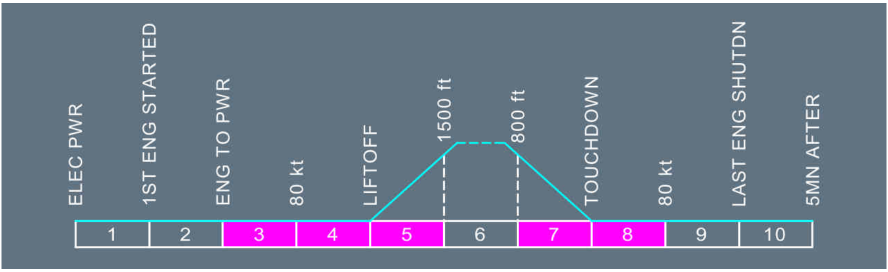
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Both loops are inoperative, or
- Fire Detection Unit is inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-APU-B-00020743.0001001 / 17 MAR 17

L2 Loss of both fire detection loops. In the case of a fire, there will be no alerts in the cockpits.

L1 Crew awareness.

Ident.: PRO-ABN-APU-B-00020745.0001001 / 17 MAR 17

STATUS

INOP SYS

APU FIRE DET

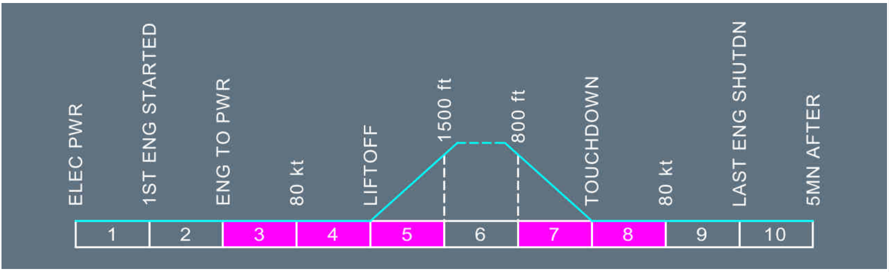
APU FIRE LOOP A(B) FAULT

Applicable to: ALL

Ident.: PRO-ABN-APU-D-00020750.0001001 / 17 MAR 17

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-APU-D-00020749.0001001 / 17 MAR 17

Crew awareness.

Ident.: PRO-ABN-APU-D-00020751.0001001 / 17 MAR 17

STATUS

INOP SYS

APU LOOP A (B)

APU FIRE

Applicable to: ALL

Ident.: PRO-ABN-APUF-C-00017458.0001001 / 21 MAR 16

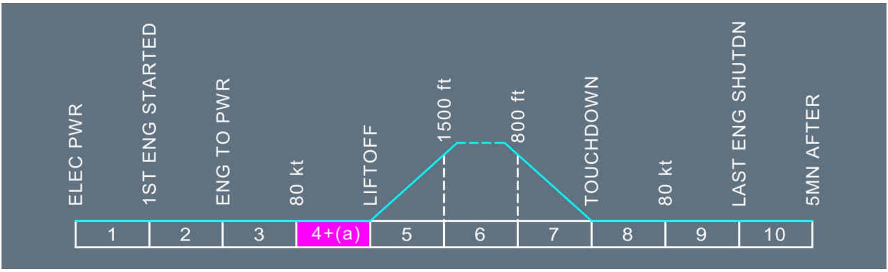
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Fire is detected by both loops, or
- Fire is detected by one loop when the other loop is failed, or
- A rupture occurs in both loops within 5 s.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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3
4+(a)
5
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Note: (a) Alert inhibited between V1 and lift off +15 s.

Continued on the following page

APU FIRE (Cont'd)

Ident.: PRO-ABN-APUF-C-00011609.0001001 / 07 FEB 11

LAND ASAP

APU FIRE P/B...PUSH

L2
- *APU LP valve closes*
- *Aural warning stops*
- *APU FIRE pb-sw remains lit, as long as fire is detected.*

L1 AGENT AFTER 10 S...DISCH

L2 *The 10 s delay allows the airflow to decrease, which increases the effect of the agent. Automatic countdown on the ECAM.*

L1 APU MASTER SW...OFF

L2 *Do not attempt to restart the APU.*

Ident.: PRO-ABN-APUF-C-00011610.0001001 / 07 FEB 11

STATUS

	INOP SYS
	APU

AUTOLAND

Ident.: PRO-ABN-AUTO_FLT-00010087.0001001 / 18 MAY 22
Applicable to: ALL

The red AUTOLAND lights flash on the glareshield.
For more information about the conditions of flashing of the AUTOLAND lights, *Refer to DSC-22_30-80-10 AUTOLAND Light*.

Note: *If the autopilot is disengaged below 200 ft AGL using the instinctive disconnect pb, the AUTOLAND lights will flash for 3 s. If visual references are insufficient, initiate a go-around.*

GO-AROUND....................PERFORM

AUTO FLT AP OFF

Applicable to: ALL

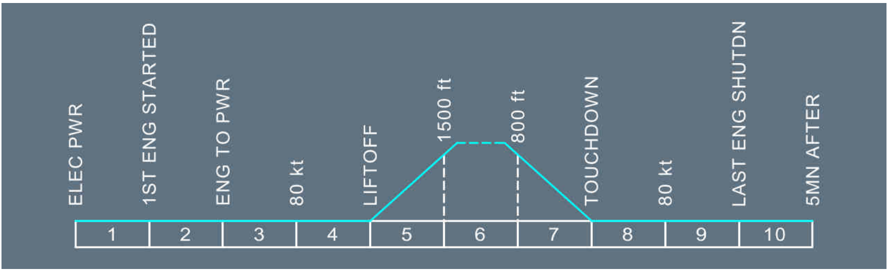
Ident.: PRO-ABN-AUTO_FLT-C-00017789.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when this warning is displayed only for involuntary disconnection.
For voluntary disconnection a red AP OFF message is displayed in the right lower part of ECAM upper DU.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AUTO FLT AP OFF (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-C-00019119.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AUTO_FLT-C-00010073.0002001 / 12 FEB 13

STATUS

INOP SYS

AP (affected)
CAT 2 (1)
GLS AUTOLAND ◁ (1)

(1) *(if both AP lost)*

AUTO FLT A/THR LIMITED

Applicable to: ALL

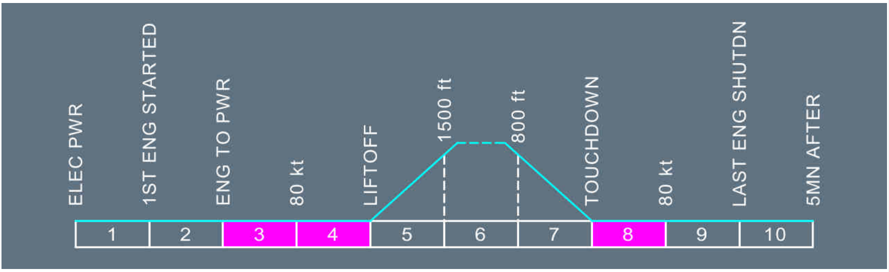
Ident.: PRO-ABN-AUTO_FLT-L-00017785.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the A/THR is active, the thrust levers are not in the CLB or MCT detent.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AUTO FLT A/THR LIMITED (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-L-00019118.0001001 / 21 MAR 16

L2 The caution is repeated every 5 s as long as the thrust levers are not moved.

L1

- **If all engine operative:**
  THR LEVER...CLB
- **In case of engine out:**
  THR LEVERS (REMAINING ENGINES)...MCT

AUTO FLT A/THR OFF

Applicable to: ALL

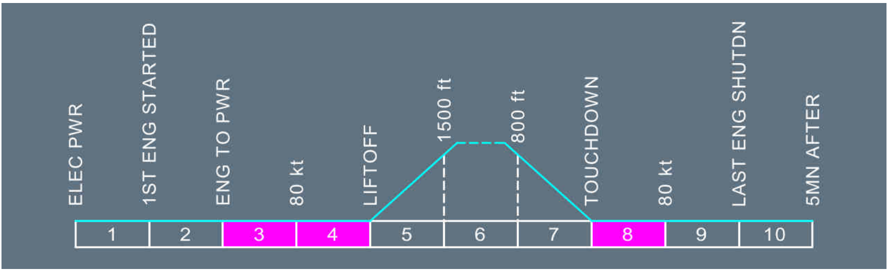
Ident.: PRO-ABN-AUTO_FLT-D-00017786.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when this warning is displayed only for involuntary disconnection.
For voluntary disconnection an amber A/THR OFF message is displayed in the right lower part of ECAM upper DU.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AUTO FLT A/THR OFF (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-D-00017702.0001001 / 21 MAR 16

L2 If A/THR is failed, the flight crew may recover it by engaging the other AP, and then trying to re-engage the A/THR.

Note: If the A/THR is recovered with AP 2, A/THR will be lost again at AP 2 disengagement.

L1 THR LEVERS...MOVE

L2 *Thrust is frozen after autothrust disconnection until the thrust levers are moved.*

Note: If the thrust levers are not moved, the "ENG THRUST LOCKED" warning is then triggered every 5 s (Refer to PRO-ABN-ENG ENG THRUST LOCKED).

Ident.: PRO-ABN-AUTO_FLT-D-00017703.0001001 / 21 MAR 16

STATUS

	INOP SYS
CAT 2 ONLY	A/THR CAT 3

AUTO FLT FCU FAULT
(PARTIAL LOSS OF THE FCU)

Applicable to: ALL

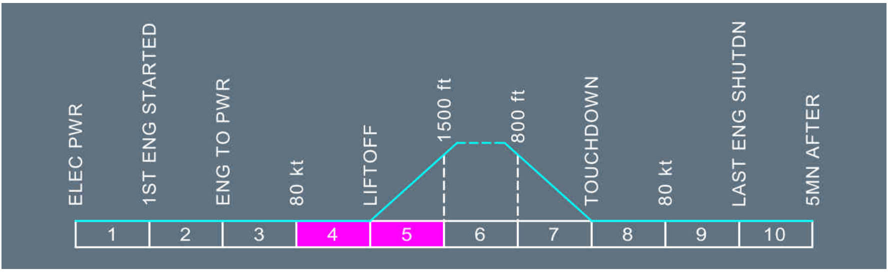
Ident.: PRO-ABN-AUTO_FLT-H-00017792.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when only one FCU channel remain operative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AUTO_FLT-H-00010083.0001001 / 20 DEC 13

BARO REF...CHECK

L2 *Barometer reference setting on FCU and PFDs must be crosschecked.*

L1
- **If necessary:**

  AFS TARGET...RESELECT

Ident.: PRO-ABN-AUTO_FLT-H-00010084.0003001 / 20 DEC 13

STATUS

INOP SYS

PART FCU

AUTO FLT FCU FAULT
(TOTAL LOSS OF THE FCU)

Applicable to: ALL

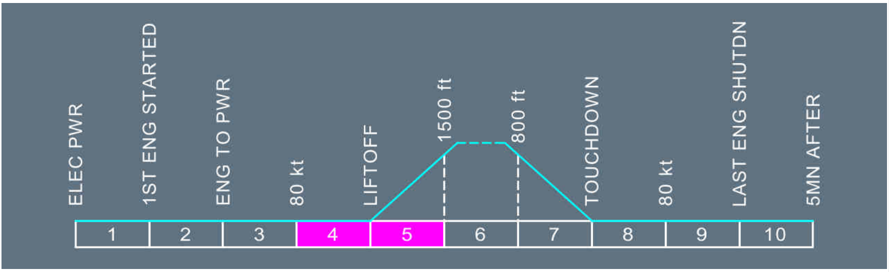
Ident.: PRO-ABN-AUTO_FLT-I-00018822.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a complete loss of the FCU.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AUTO FLT FCU FAULT (Cont'd)
(TOTAL LOSS OF THE FCU)

Ident.: PRO-ABN-AUTO_FLT-I-00017707.0001001 / 02 JUN 20

PFD BARO REF: STD ONLY

L2 *With all FCU channels failed, the barometer reference goes to 1 013 hPa.*
Use standby altimeter to change this to the actual barometer setting.
Do not insert the MDA (MDH) value on the MCDU PERF APPR page (because the PFD altitude is referenced to STD, not to the correct barometric value).
The PM shall then perform the standard callouts ("HUNDRED ABOVE" and "MINIMUM"), using the STBY altimeter.

In addition:
- *All FCU controls are inoperative.*
- *A/THR, AP 1+2 and FD 1+2 not available.*
  (except in LAND or GO AROUND mode where only A/THR is lost)
- *On PFD:*
  - *Altitude alert is inoperative.*
  - *ILS deviation scales are displayed.*
  - *TRK/FPA selection is lost.*
  - *MACH selection is lost.*
- *On ND:*
  - *ROSE NAV mode with map (80 NM range) is displayed.*
  - *Weather radar display is lost and WXR RNG red flag is displayed if the 80NM range was not selected at the time of the FCU failure.*
  - *VOR/ADF ◁ needles:*
    Needle 1 is related to VOR1 only.
    Needle 2 is related to ADF2 ◁ only.
- *On DDRMI ◁ :*
  VOR/ADF ◁ selection is not affected.

Continued on the following page

AUTO FLT FCU FAULT (Cont'd)
(TOTAL LOSS OF THE FCU)

Ident.: PRO-ABN-AUTO_FLT-I-00017708.0001001 / 21 MAR 16

STATUS

PFD BARO REF: STD ONLY

INOP SYS

AP 1+2
A/THR
FCU
GPWS TERR
CAT 2

AUTO FLT FM 1 (2) FAULT

Applicable to: ALL

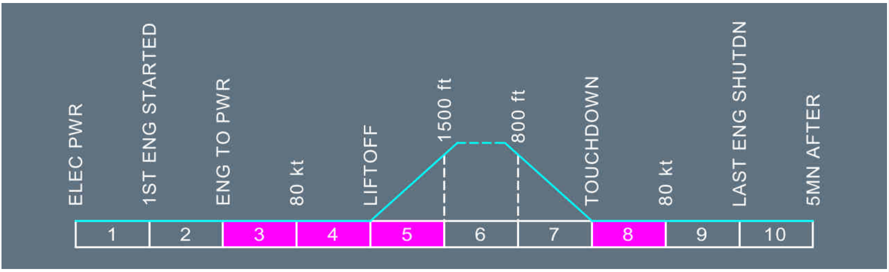
Ident.: PRO-ABN-AUTO_FLT-A-00017794.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one FMS is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

AUTO FLT FM 1 (2) FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-A-00010068.0001001 / 06 AUG 10

L2 This warning is associated with MAP NOT AVAIL message, that is displayed on the corresponding ND.

L1 FM SOURCE .... BOTH ON 2 (1)

L2 *Both NDs use the same FM information.*

Ident.: PRO-ABN-AUTO_FLT-A-00017712.0001001 / 13 JUL 16

STATUS

	INOP SYS
CAT 3 SINGLE ONLY	AP 1 (2) FM 1 (2) GPWS TERR (1) CAT 3 DUAL

(1) *(Only if FM1 is lost)*

AUTO FLT FM 1 + 2 FAULT

Applicable to: ALL

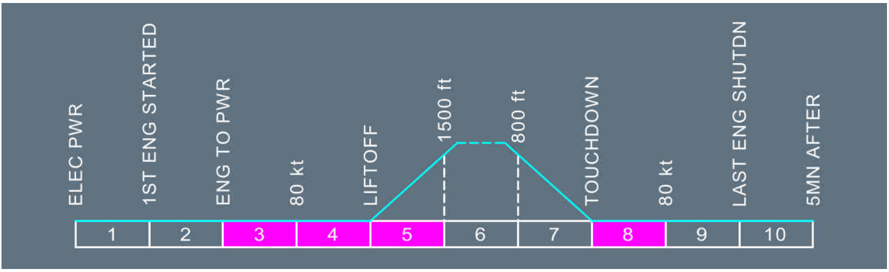
Ident.: PRO-ABN-AUTO_FLT-B-00017795.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both FMS are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AUTO_FLT-B-00019101.0002001 / 21 MAR 16

FM SOURCE.. NORM

L2 *The FM source selector must be at NORM, to allow the NAV B/UP prompt to be displayed on the MCDU MENU page*

L1 NAVAID TUNING ....USE RMP

L2 *Set both RMPs to NAV*

L1 LDG ELEV.. ADJUST

L2 *CPCs normally use the Landing Elevation from the FM.*

Continued on the following page

AUTO FLT FM 1 + 2 FAULT (Cont'd)

Ident.: PRO-ABN-AUTO_FLT-B-00017721.0001001 / 21 MAR 16

L12

STATUS

MCDU BACK UP NAV AVAIL

INOP SYS

FM 1 + 2
AP 1 + 2 (1)
GPWS TERR
REAC W/S DET (2)
CAT 2 (1)

Note: Therefore, DH indication is lost, ILS approach may only be a CAT 1 approach.

(1) *(If the FG parts of the FMGES are lost)*
(2) *(If the FE part of the FMGES is lost)*

AUTO FLT FMGEC VERSIONS DISAGREE

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

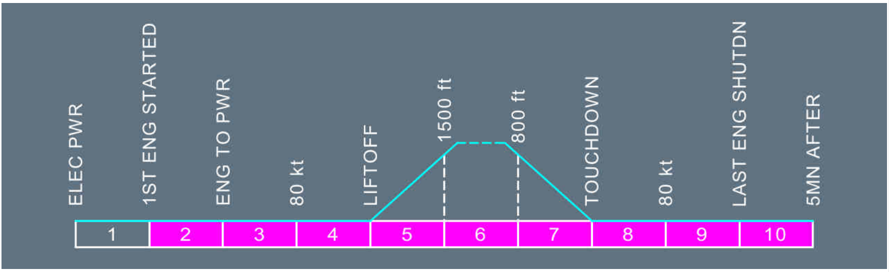
Ident.: PRO-ABN-AUTO_FLT-K-00017804.0005001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the aircraft is equipped with two different FMGEC standards.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AUTO_FLT-K-00019121.0007001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AUTO_FLT-K-00014984.0006001 / 23 AUG 13

STATUS

INOP SYS

AP 1 (2) (1+2)
A/THR

AUTO FLT REAC W/S DET FAULT

Applicable to: ALL

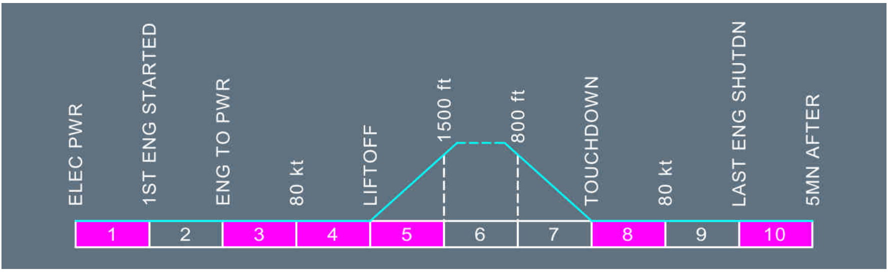
Ident.: PRO-ABN-AUTO_FLT-E-00017806.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reactive windshear function is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AUTO_FLT-E-00019122.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-AUTO_FLT-E-00010077.0001001 / 06 AUG 10

STATUS

INOP SYS

REAC W/S DET

AUTO FLT TCAS MODE FAULT

Applicable to: LV-KAN, LV-KAO

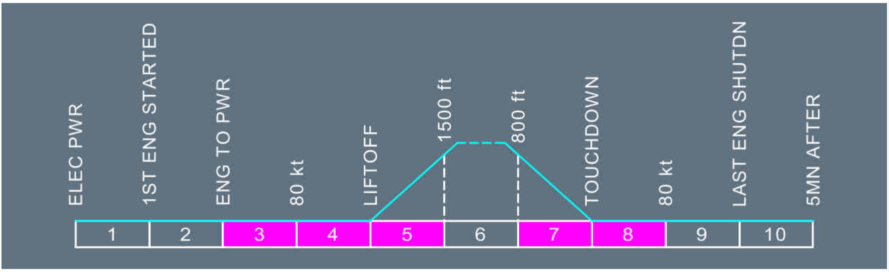
Ident.: PRO-ABN-AUTO_FLT-J-00017807.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the TCAS flight guidance mode is inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-AUTO_FLT-J-00013089.0001001 / 17 MAR 11

- **FOR TCAS ALERT**

  AP+FD..OFF

  FLY MANUALLY TCAS ORDER

Ident.: PRO-ABN-AUTO_FLT-J-00013090.0001001 / 17 MAR 11

STATUS

INOP SYS

AP/FD TCAS

[MEM] LOSS OF BRAKING

Ident.: PRO-ABN-BRAKES-00010803.0001001 / 05 JUN 18
Applicable to: ALL

- **If no braking:**

REV...MAX

L2 *If needed, the flight crew may keep maximum reverse thrust until full aircraft stop.*

L1 BRAKE PEDALS...RELEASE

L2 *When the flight crew sets the A/SKID & N/W STRG sw to OFF, the alternate braking mode is activated. Consequently the PF should release the brake pedals before the PM selects the A/SKID off. This action avoids brutal braking application.*
For information on the alternate braking mode, Refer to DSC-32-30-10 Alternate Braking Without Antiskid.

L1 A/SKID OFF...ORDER

L2 *The PF orders the PM to set the A/SKID & N/W STRG sw to OFF.*

L1 A/SKID & N/W STRG...OFF
BRAKE PEDALS...PRESS
MAX BRK PR...1000 PSI

L2 *Limit brake pressure to approximately 1 000 PSI. Monitor brake pressure on the BRAKES PRESS indicator.*

L1
- **If still no braking:**

PARK BRAKE...USE

Use short successive parking brake applications to stop the aircraft.
L2 *For more information on the parking brake, Refer to DSC-32-30-10 Parking Brake.*

BRAKES A/SKID N/WS OFF

Applicable to: ALL

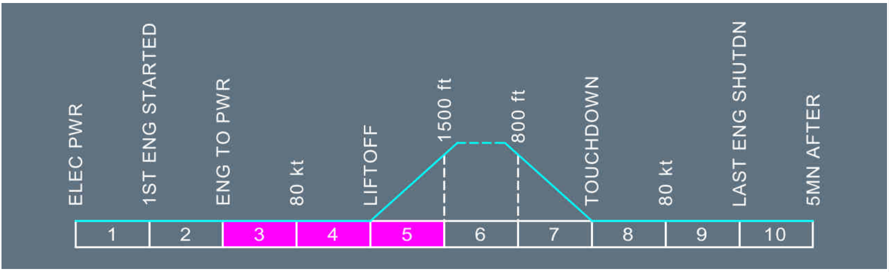
Ident.: PRO-ABN-BRAKES-L-00018120.0005001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the A/SKID & N/W STRG sw is set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-L-00019052.0001001 / 21 MAR 16

L2 Braking is in alternate mode. For any pedal deflection, the braking effect is higher in alternate mode than in normal mode.

L1 MAX BRK PR.. 1000 PSI

L2 *Monitor brake pressure on the BRAKES PRESS indicator. Limit brake pressure to approximately 1 000 PSI and, at low ground speed, adjust brake pressure as required.*
Avoid landing on an icy runway.

Continued on the following page

BRAKES A/SKID N/WS OFF (Cont'd)

Ident.: PRO-ABN-BRAKES-L-00019422.0001001 / 21 MAR 16

L12

STATUS

MAX BRK PR..1000 PSI

LDG DIST PROC.. APPLY

CAT 3 SINGLE ONLY

See (1)

INOP SYS

ANTI SKID
CAT 3 DUAL
N/W STRG
AUTO BRK

(1) *Note:* *As specified in the QRH / OPS / REQUIRED EQUIPMENT FOR CAT2 AND CAT3, automatic rollout is not authorized.*

BRAKES ANTI SKID FAULT

Applicable to: ALL

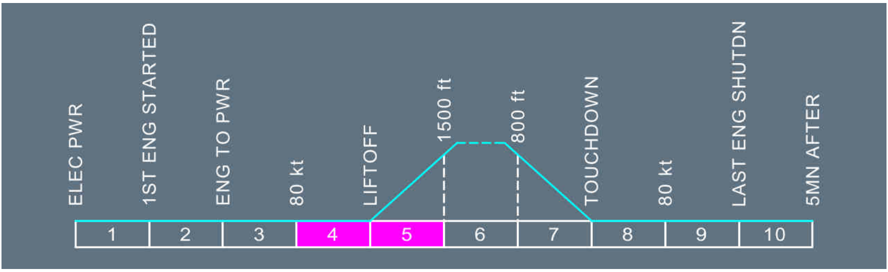
Ident.: PRO-ABN-BRAKES-AG-00019419.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the antiskid is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

BRAKES ANTI SKID FAULT (Cont'd)

Ident.: PRO-ABN-BRAKES-AG-00019420.0001001 / 21 MAR 16

L2 Braking is in alternate mode. For any pedal deflection, the braking effect is higher in alternate mode than in normal mode.

L1 MAX BRK PR... 1000 PSI

L2 *Monitor brake pressure on the BRAKES PRESS indicator. Limit brake pressure to approximately 1 000 PSI and, at low ground speed, adjust brake pressure as required.*
Avoid landing on an icy runway.

Ident.: PRO-ABN-BRAKES-AG-00019421.0001001 / 21 MAR 16

L12

STATUS

	INOP SYS
MAX BRK PR...1000 PSI	ANTI SKID CAT 3 DUAL AUTO BRK
LDG DIST PROC.. APPLY	
CAT 3 SINGLE ONLY *See* (1)	

(1) *Note: As specified in the QRH / OPS / REQUIRED EQUIPMENT FOR CAT2 AND CAT3, automatic rollout is not authorized.*

BRAKES AUTO BRK FAULT

Applicable to: ALL

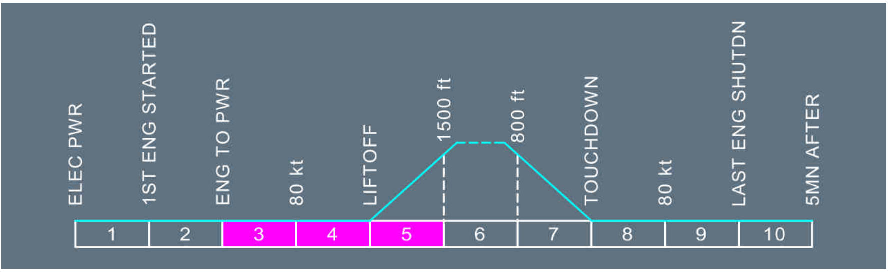
Ident.: PRO-ABN-BRAKES-U-00018118.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the autobrake function is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-U-00019050.0001001 / 21 MAR 16

L2 Normal braking can be lost.

L1 Crew awareness.

Ident.: PRO-ABN-BRAKES-U-00010805.0001001 / 21 NOV 11

STATUS

	INOP SYS
CAT 3 SINGLE ONLY	AUTO BRK CAT 3 DUAL NORM BRK (1)

(1) *(NORM BRK is inoperative in case of failure causing the AUTO-BRK FAULT caution to trigger with a switch to alternate braking (failures affecting the BSCU, the Normal Selector Valve, the Normal Servo Valve, or brake pedal transmitter unit).)*

BRAKES HOT

Applicable to: ALL

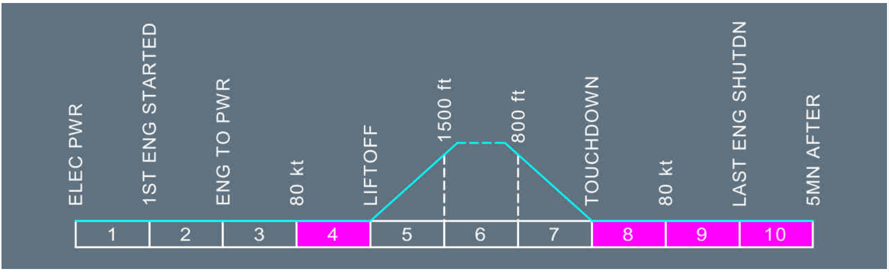
Ident.: PRO-ABN-BRAKES-P-00018124.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the temperature of at least one brake is above 300 °C.
The alert disappears when the highest brake temperature goes below 290 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

BRAKES HOT (Cont'd)

Ident.: PRO-ABN-BRAKES-P-00019172.0003001 / 21 MAR 17

- **On ground :**

BRK FAN ◁ .... ON

L2 *Note:* *The brake temperature sensor is located close to the carbon, but not inside. Consequently, when the brake fan ◁ is ON, the indicated temperatures decrease rapidly. Before the flight crew selects the brake fans ◁ at the gate, they should first warn the ground personnel in order to avoid blowing carbon brake dust on them.*

L1 PARK BRK : PREFER CHOCKS

L2 *If the BRAKES HOT alert is still displayed when the aircraft is parked, the flight crew should not set the PARKING BRK ON.*

L1 DELAY T.O. FOR COOLG

L2 - *Delay takeoff until the brake temperature is below 300 °C (or 150 °C with the brake fans ◁ on)*

L1 - **In flight :**

MAX SPEED.. 250/.55

L2 - *If performance permits, the flight crew should delay the landing gear retraction in order to improve brake cooling*

L2 - *Reduce the speed to 250 kt for landing gear operation.*

L1 ● **IF PERF PERMITS :**

L/G.. DN FOR COOLG

Ident.: PRO-ABN-BRAKES-P-00019102.0001001 / 21 MAR 16

STATUS

MAX SPEED.. 250/.55

BRAKES PARK BRK FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAO, LV-KHT, LV-KHU

Ident.: PRO-ABN-BRAKES-O-00018127.0007001 / 21 MAR 16

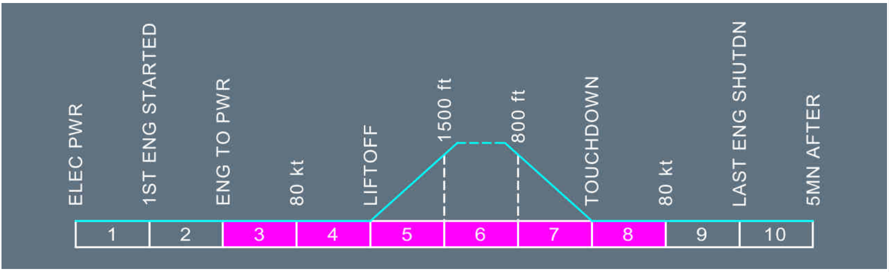
1

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the parking brake is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-O-00013663.0003001 / 09 OCT 14

2

- **On ground**
  - **If PARKING BRK handle is OFF and parking brake pressure is still applied :**

    BRK PRESS STILL APPLIED
  - **If PARKING BRK handle is ON and no parking brake pressure is applied :**

    BRK PRESS RELEASED

    PARK BRK.. OFF
    - **BEFORE ENG SHUT DOWN :**

      CHOCKS.. CONSIDER

BRAKES PARK BRK LO PR

Applicable to: ALL

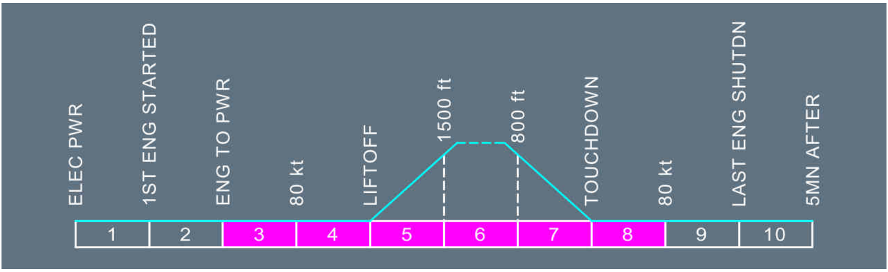
Ident.: PRO-ABN-BRAKES-N-00018128.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the parking brake pressure is low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-N-00018646.0001001 / 21 MAR 16

BRK ACCU PR..CHECK

L2 *The blue electrical pump can be used to pressurize the accumulators.*

L1
- **BEFORE ENG S/D :**

  CHOCKS..CONSIDER

L2 *Consider requesting the chocks before shutting down the engine, if the parking brake accumulator pressure is not in the green band.*

BRAKES PARK BRK ON

Applicable to: ALL

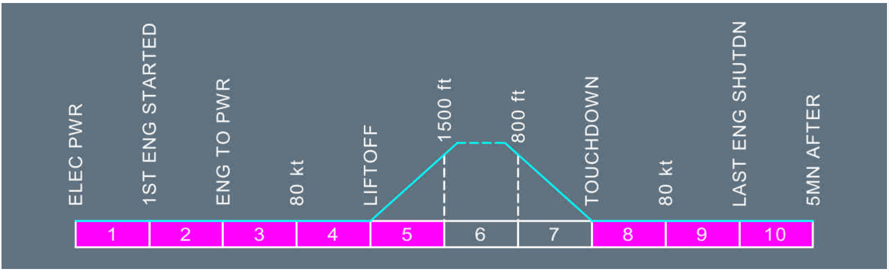
Ident.: PRO-ABN-BRAKES-T-00018129.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the parking brake is set to ON in flight.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-T-00019265.0001001 / 21 MAR 16

PARK BRK.. OFF

BRAKES RELEASED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Ident.: PRO-ABN-BRAKES-M-00018130.0002001 / 05 MAR 19

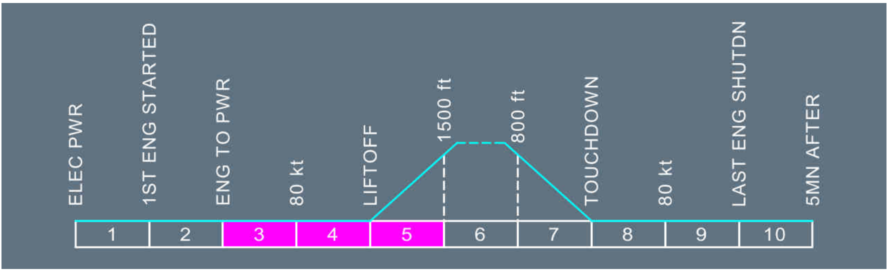
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when:
- A tachometer is failed, or
- A servo valve is jammed closed on one or two wheels.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-M-00018689.0001001 / 21 MAR 16

BRAKE 1 (2, 3, 4 , 5, 6, 7, 8) RELEASED

Ident.: PRO-ABN-BRAKES-M-00010788.0001001 / 11 MAY 12

STATUS

LDG DIST PROC.. APPLY

CAT 3 SINGLE ONLY

INOP SYS

AUTO BRK
CAT 3 DUAL

BRAKES RELEASED

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Ident.: PRO-ABN-BRAKES-M-00018130.0001001 / 21 MAR 16

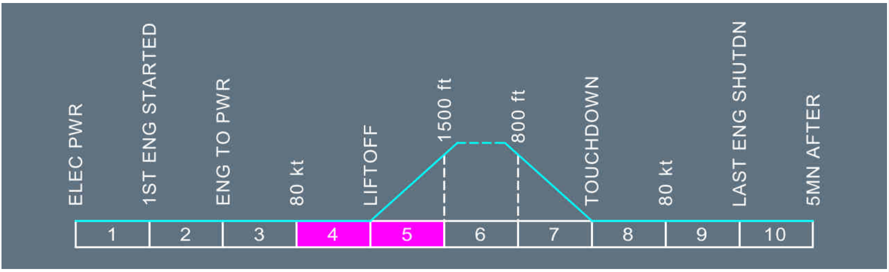
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when:
- A tachometer is failed, or
- A servo valve is jammed closed on one or two wheels.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-M-00018689.0001001 / 21 MAR 16

BRAKE 1 (2, 3, 4 , 5, 6, 7, 8) RELEASED

Ident.: PRO-ABN-BRAKES-M-00010788.0001001 / 11 MAY 12

STATUS

LDG DIST PROC.. APPLY

CAT 3 SINGLE ONLY

INOP SYS

AUTO BRK
CAT 3 DUAL

BRAKES RESIDUAL BRAKING

Applicable to: ALL

Ident.: PRO-ABN-BRAKES-AA-00018131.0001001 / 21 MAR 16

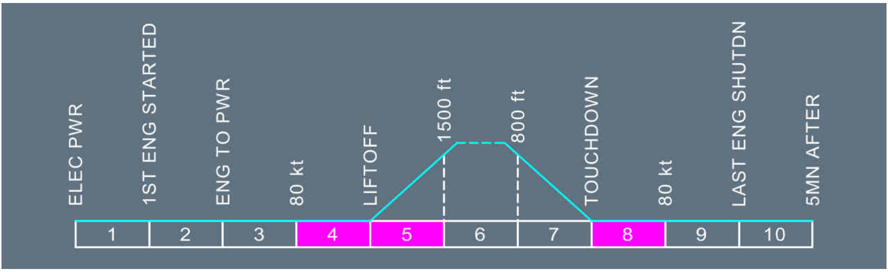
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when residual brake pressure is detected with pedals released:
- On at least one wheel, when in normal braking mode, or
- On left or right main landing gear side (affecting the four wheels), when in alternate braking mode.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

BRAKES RESIDUAL BRAKING (Cont'd)

Ident.: PRO-ABN-BRAKES-AA-00019103.0004001 / 21 MAR 17

Maintenance action is due.

ON BRAKE 1(2, 3, 4, 5, 6, 7, 8)

L2 ■ **On ground:**

On ground, the flight crew may attempt a BSCU reset since the BRAKES RESIDUAL BRAKING ECAM caution may be spurious, due to :

- Drifted pressure transducer, after aircraft electrical power-up, or
- BSCU detection of residual pressure decay after brake release.

The aircraft must be stopped, and the parking brake applied, before the flight crew switches the A/SKID & N/W STRG sw OFF then ON.

L1 ■ **In flight:**

L2 For simplification purposes, the following procedure must be applied in all residual braking cases (of the normal or alternate system), even if some actions are not really necessary in the case of actual residual pressure on the normal braking system.

L1 A/SKID NWS....KEEP ON
BRAKE PEDAL....SEVERAL USE

L2 *Press the brakes pedals several times. This could zero a residual pressure on the alternate system.*

L1 ● **IF STILL RESIDUAL BRKG :**
AUTO BRK.... MED

L2 *Using MED mode gives immediate priority to normal braking upon landing gear touchdown, which cancels alternate pressure.*

L1 ● **IF PEDAL BRAKING ONLY :**
JUST AFTER TOUCHDOWN :
BRK PEDAL....USE

L2 *If the autobrake is not available, pressing the brake pedals gives immediate priority to normal braking, which cancels residual alternate pressure.*

Beware of possible braking asymmetry after touchdown, which can be controlled via the pedals.

L1
L2 Note: *In the case of taxi with deflated or damaged tires, Refer to LIM-LG Taxi with Deflated or Damaged Tires.*

BRAKES SYS 1(2) FAULT

Applicable to: ALL

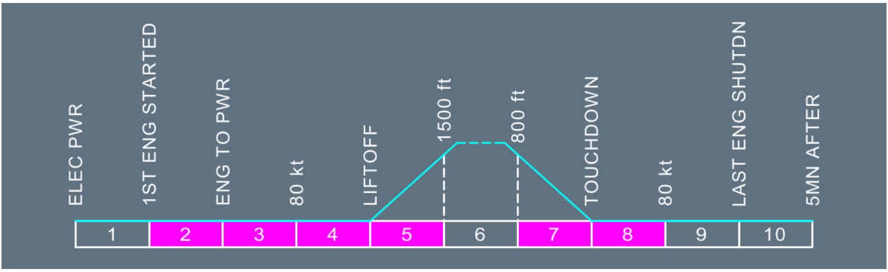
Ident.: PRO-ABN-BRAKES-R-00018132.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one BSCU system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-BRAKES-R-00018660.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-BRAKES-R-00018661.0001001 / 21 MAR 16

STATUS

INOP SYS

BRAKES SYS 1(2)

Intentionally left blank

CAB PR EXCESS CAB ALT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

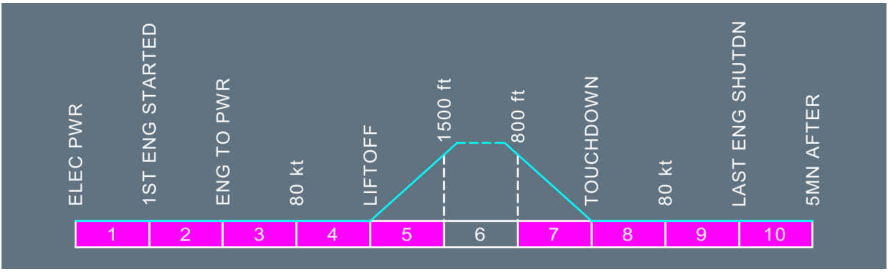
Ident.: PRO-ABN-CAB_PR-L-00017449.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:
- In climb or descent, the cabin altitude is above the higher of:
  - 9 550 ft, or
  - 1 000 ft above the airfield pressure altitude.
- In cruise, the cabin altitude is above 9 550 ft.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

CAB PR EXCESS CAB ALT (Cont'd)

Ident.: PRO-ABN-CAB_PR-L-00018186.0025001 / 03 NOV 23

- **If above FL 100:**

  CREW OXY MASKS.......USE

  - **If below FL 160:**

    DESCENT.......INITIATE
    CABIN CREW.......ADVISE

  - **If above FL 160:**

    SIGNS.......ON
    • EMER DESCENT:
    DESCENT.......INITIATE

    - **If A/THR is not active:**

      THR LEVERS.......IDLE

    L2 *If the A/THR is active, check A/THR is at IDLE on the ED.*

    L1 SPD BRK.......FULL
    SPD.......MAX/APPROPRIATE

    L2 *Descend at maximum appropriate speed. However, if structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*
    The landing gear may be extended. In this case, speed must be reduced to VLO/VLE.

    L1 ENG START SEL.......IGN
    ATC.......NOTIFY

    L2 *Notify ATC of the nature of the emergency, and state intention. The flight crew can communicate with the ATC using voice, or CPDLC when the voice contact cannot be established or has a poor quality.*

    L1 EMER DESCENT.......ANNOUNCE (PA)
    ATC XPDR 7700.......CONSIDER

    L2 *Squawk 7700 unless otherwise specified by ATC.*

    L1 *Note:* *To save oxygen, set the oxygen diluter selector to the N position.*
    With the oxygen diluter selector set to 100 %, oxygen quantity may not be sufficient for the entire descent profile.
    Ensure that the flight crew can communicate wearing oxygen masks.
    Avoid the continuous use of the interphone to minimize the interference from the noise of the oxygen mask.
    When descent is established, and if time permits, check that the OUTFLOW VALVES are closed on the CAB PRESS SD page. If they are not closed and

Continued on the following page

CAB PR EXCESS CAB ALT (Cont'd)

ΔP is positive, select the other CPC. If the OUTFLOW VALVE is still not closing select manual control and the V/S CTL sw to full down.

MAX FL.. 100/MEA-MORA

- **IF CAB ALT>14000 FT:**

  PAX OXY MASKS..MAN ON

L2 *This action confirms that the passenger oxygen masks are released.*

L1 *Note:* *Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

Ident.: PRO-ABN-CAB_PR-L-00010946.0002001 / 21 MAR 17

STATUS

MAX FL..100/MEA-MORA

CAB PR EXCESS CAB ALT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Ident.: PRO-ABN-CAB_PR-L-00017449.0001001 / 21 MAR 16

ANNUNCIATIONS

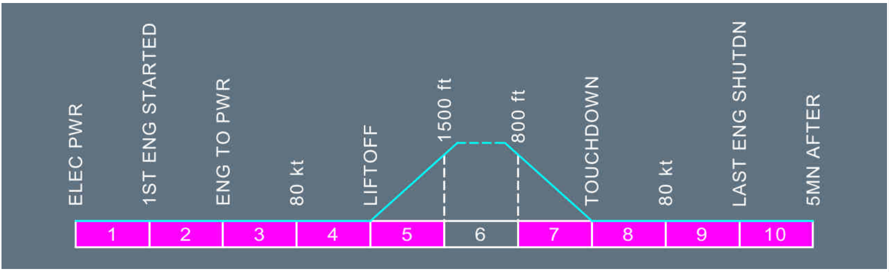
Triggering Conditions:

L2

This alert triggers when:

- In climb or descent, the cabin altitude is above the higher of:
  - 9 550 ft, or
  - 1 000 ft above the airfield pressure altitude.
- In cruise, the cabin altitude is above 9 550 ft.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

CAB PR EXCESS CAB ALT (Cont'd)

Ident.: PRO-ABN-CAB_PR-L-00018186.0015001 / 03 NOV 23

● **If above FL 100:**

CREW OXY MASKS.. USE

■ **If below FL 160:**

CABIN CREW.. INFORM
DESCENT.. INITIATE

■ **If above FL 160:**

EMER DESCENT.. ANNOUNCE (PA)
SIGNS.. ON

- EMER DESCENT:

DESCENT.. INITIATE

● **If A/THR is not active:**

THR LEVERS.. IDLE

L2 *If the A/THR is active, check A/THR is at IDLE on the ED.*

L1 SPD BRK.. FULL
SPD.. MAX/APPROPRIATE

L2 *Descend at maximum appropriate speed. However, if structural damage is suspected, use the flight controls with care and reduce speed as appropriate.*
The landing gear may be extended. In this case, speed must be reduced to VLO/VLE.

L1 ENG START SEL.. IGN
ATC.. NOTIFY

L2 *Notify ATC of the nature of the emergency, and state intention. The flight crew can communicate with the ATC using voice, or CPDLC when the voice contact cannot be established or has a poor quality.*

L1 ATC XPDR 7700.. CONSIDER

L2 *Squawk 7700 unless otherwise specified by ATC.*

L1 *Note:* *To save oxygen, set the oxygen diluter selector to the N position.*
With the oxygen diluter selector set to 100 %, oxygen quantity may not be sufficient for the entire descent profile.
Ensure that the flight crew can communicate wearing oxygen masks.
Avoid the continuous use of the interphone to minimize the interference from the noise of the oxygen mask.
When descent is established, and if time permits, check that the OUTFLOW VALVES are closed on the CAB PRESS SD page. If they are not closed and

Continued on the following page

CAB PR EXCESS CAB ALT (Cont'd)

ΔP is positive, select the other CPC. If the OUTFLOW VALVE is still not closing select manual control and the V/S CTL sw to full down.

MAX FL.. 100/MEA-MORA

- **IF CAB ALT>14000 FT:**

  PAX OXY MASKS...MAN ON

L2 *This action confirms that the passenger oxygen masks are released.*

L1 *Note: Notify the cabin crew when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

Ident.: PRO-ABN-CAB_PR-L-00010946.0002001 / 21 MAR 17

STATUS

MAX FL...100/MEA-MORA

CAB PR EXCESS RESIDUAL PR

Applicable to: ALL

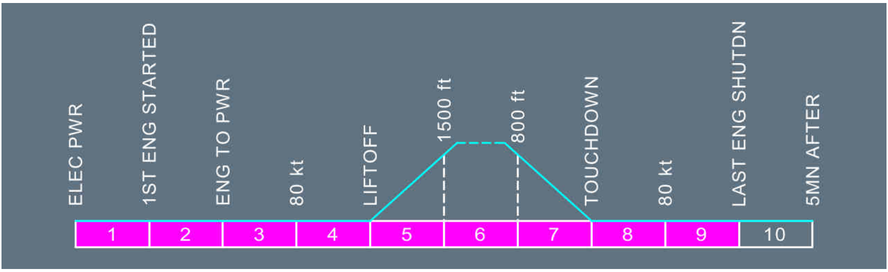
Ident.: PRO-ABN-CAB_PR-AA-00017456.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the differential pressure is still above 2.5 hPa (0.036 PSI) 12 s after the last engine shutdown.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CAB_PR-AA-00018201.0001001 / 21 MAR 16

PACK 1..OFF
PACK 2..OFF
CABIN CREW...ALERT

CAB PR FWD(AFT) OFV NOT OPEN

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

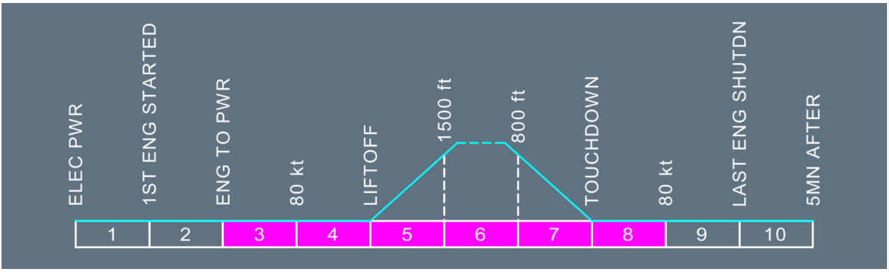
Ident.: PRO-ABN-CAB_PR-AK-00017452.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers on ground, when the outflow valve is not fully open (time delay 90 s).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CAB_PR-AK-00018202.0004001 / 01 OCT 19

CAB PR MODE SEL .... MAN
MAN VALVE SEL .... FWD (AFT)
MAN V/S CTL .... FULL UP

L2 *It may take 10 s in manual mode, before the flight crew notices a change of the outflow valve position.*

L1 ● **IF UNSUCCESSFUL:**
PACK 1 .... OFF
PACK 2 .... OFF

Ident.: PRO-ABN-CAB_PR-AK-00019376.0001001 / 21 MAR 16

STATUS

FWD(AFT) OFV CTL: MAN ONLY

CAB PR FWD(AFT) OFV NOT OPEN

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

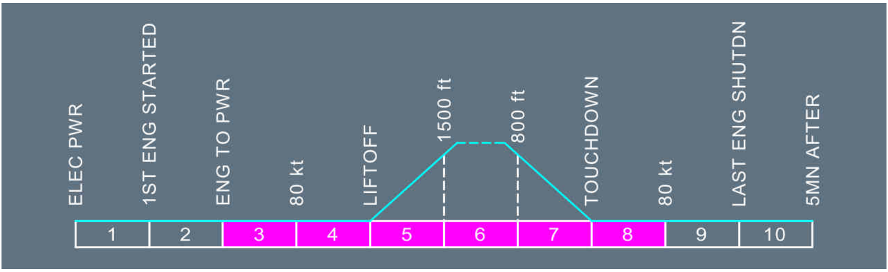
Ident.: PRO-ABN-CAB_PR-AK-00017452.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers on ground, when the outflow valve is not fully open (time delay 90 s).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CAB_PR-AK-00018202.0001001 / 21 MAR 16

MODE SEL.. MAN
MAN VALVE SEL.. FWD (AFT)
MAN V/S CTL..FULL UP

L2 *Note:* *It may take 10 s in manual mode, before the flight crew notices a change of the outflow valve position.*

L1 ● **IF UNSUCCESSFUL:**

PACK 1.. OFF
PACK 2.. OFF

Ident.: PRO-ABN-CAB_PR-AK-00019376.0001001 / 21 MAR 16

STATUS

FWD(AFT) OFV CTL: MAN ONLY

CAB PR LDG ELEV FAULT

Applicable to: ALL

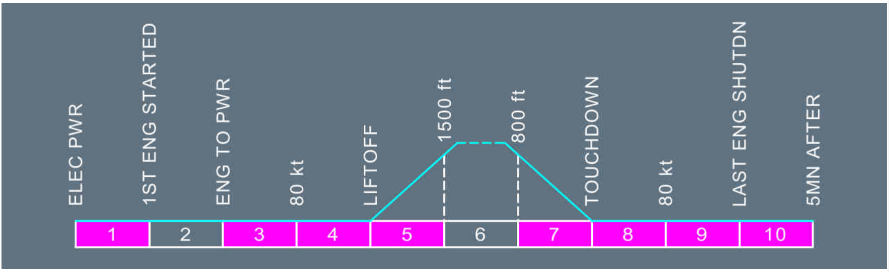
Ident.: PRO-ABN-CAB_PR-AI-00017454.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the LDG ELEV selector is set to AUTO and the landing field elevation of the FMGS is not available.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CAB_PR-AI-00018440.0002001 / 21 MAR 16

LDG ELEV.. ADJUST

L2 *The flight crew must select the landing field elevation manually with the LDG ELEV selector. Refer to the LDG ELEV indication on the CRUISE page, or on the CAB PRESS SD page, to adjust the required landing field elevation.*

Note: If the landing is performed using QFE, set "0" feet on LDG ELEV selector

L1 ● **If LDG ELEV selector is inoperative:**

LDG ELEV SET AT ZERO

CAB PR LO DIFF PR

Applicable to: ALL

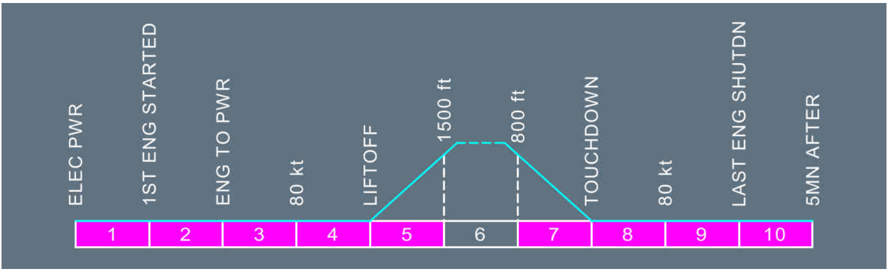
Ident.: PRO-ABN-CAB_PR-AN-00017451.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the time to reach ΔP = 0 is less than 1.5 min.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CAB_PR-AN-00018445.0001001 / 21 MAR 16

EXPECT HI CAB RATE

A/C V/S...REDUCE

L2 *This line is not displayed in the case of an Emergency Descent, due to Excessive Cabin Altitude.*

CAB PR SAFETY VALVE OPEN

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

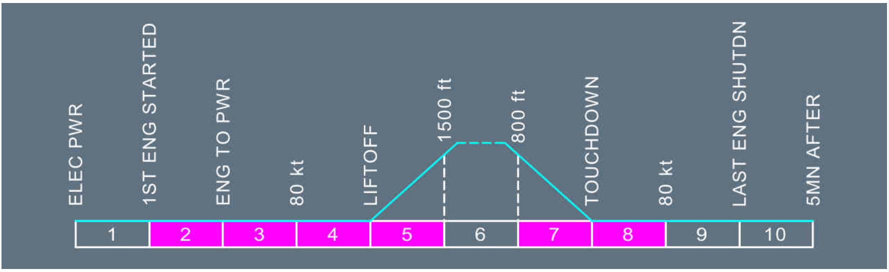
Ident.: PRO-ABN-CAB_PR-AP-00017453.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the safety valves are not fully closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

CAB PR SAFETY VALVE OPEN (Cont'd)

Ident.: PRO-ABN-CAB_PR-AP-00018446.0005001 / 10 MAY 23

- **IF DIFF PR ABV 8.7 PSI :**
  CAB PR MODE SEL....................MAN
  MAN VALVE SEL....................BOTH
  MAN V/S CTL....................AS RQRD

L2 *If overpressure is confirmed, reduce cabin ∆P.*
For manual control, refer to the CAB PR SYS 1+2 FAULT status.
It may take 10 s in manual mode, before the flight crew notices a change in the outflow valve position.

L1
  - **IF UNSUCCESSFUL :**
    A/C FL....................REDUCE

CAUTION	Below FL 190, in the case of the cabin altitude is below -2 060 ft, the cabin altitude and the cabin differential pressure values may not be available for display on the CAB PRESS SD page in manual pressurization mode. As a result, maintain the MAN V/S CTL toggle switch in the UP position to increase the cabin altitude and recover the display.

- **IF DIFF PR BELOW 0 PSI :**
  EXPECT HI CAB RATE
  A/C V/S....................REDUCE

Continued on the following page

CAB PR SAFETY VALVE OPEN (Cont'd)

Ident.: PRO-ABN-CAB_PR-AP-00019440.0001001 / 21 MAR 16

L12

STATUS

MAN CAB PR CTL
TGT V/S : CLIMB 500 FT/MIN
TGT V/S : DESC 300 FT/MIN

A/C FL	CAB ALT TGT
410	8 000
350	6 500
300	5 000
250	2500
< 200	0

- **DURING FINAL APPR :**

  MAN V/S CTL...FULL UP

  When on intermediate approach (below airfield pressure altitude +2 500 ft), adjust ΔP = 0.
  When ΔP is zero, select FULL UP to fully open both outflow valves.

CAUTION	Check that ΔP is zero before opening the doors.

CAB PR SAFETY VALVE OPEN

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

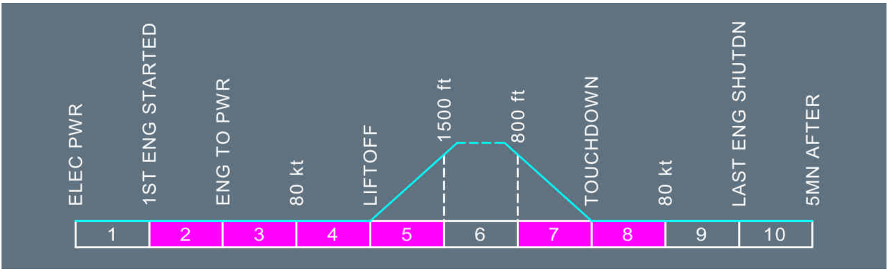
Ident.: PRO-ABN-CAB_PR-AP-00017453.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the safety valves are not fully closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

CAB PR SAFETY VALVE OPEN (Cont'd)

Ident.: PRO-ABN-CAB_PR-AP-00018446.0002001 / 10 MAY 23

- **IF DIFF PR ABV 8.7 PSI :**

  MODE SEL....................MAN
  MAN VALVE SEL....................BOTH
  MAN V/S CTL....................AS RQRD

  L2 *If overpressure is confirmed, reduce cabin ΔP.*
  For manual control, refer to the CAB PR SYS 1+2 FAULT status.
  It may take 10 s in manual mode, before the flight crew notices a change in the outflow valve position.

  L1
  - **IF UNSUCCESSFUL :**

    A/C FL.................... REDUCE

CAUTION	Below FL 190, in the case of the cabin altitude is below -2 060 ft, the cabin altitude and the cabin differential pressure values may not be available for display on the CAB PRESS SD page in manual pressurization mode. As a result, maintain the MAN V/S CTL toggle switch in the UP position to increase the cabin altitude and recover the display.

- **IF DIFF PR BELOW 0 PSI :**

  EXPECT HI CAB RATE
  A/C V/S.................... REDUCE

Continued on the following page

CAB PR SAFETY VALVE OPEN (Cont'd)

Ident.: PRO-ABN-CAB_PR-AP-00019440.0001001 / 21 MAR 16

L12

STATUS

MAN CAB PR CTL
TGT V/S : CLIMB 500 FT/MIN
TGT V/S : DESC 300 FT/MIN

A/C FL	CAB ALT TGT
410	8 000
350	6 500
300	5 000
250	2500
< 200	0

- **DURING FINAL APPR :**

  MAN V/S CTL...FULL UP

  When on intermediate approach (below airfield pressure altitude +2 500 ft), adjust ΔP = 0.
  When ΔP is zero, select FULL UP to fully open both outflow valves.

CAUTION	Check that ΔP is zero before opening the doors.

CAB PR SYS 1(2) FAULT

Applicable to: ALL

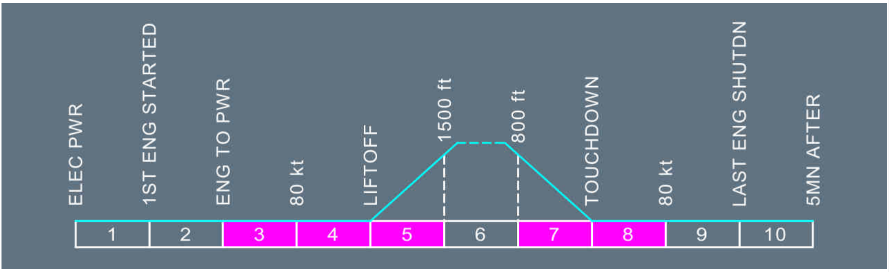
Ident.: PRO-ABN-CAB_PR-M-00017455.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one cabin pressure controller is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CAB_PR-M-00019255.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-CAB_PR-M-00019256.0001001 / 21 MAR 16

STATUS

INOP SYS

CAB PR 1(2)

CAB PR SYS 1+2 FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

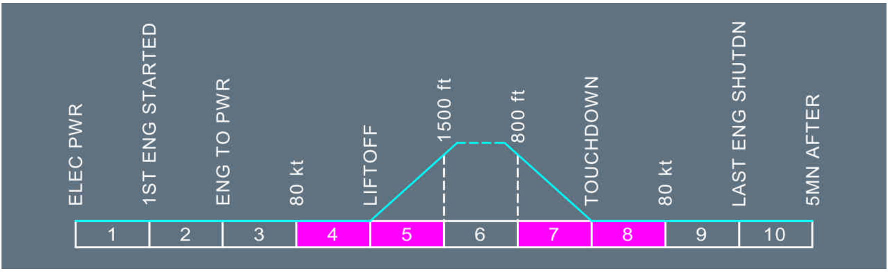
Ident.: PRO-ABN-CAB_PR-N-00017450.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both cabin pressure controllers are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

CAB PR SYS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-CAB_PR-N-00019257.0003001 / 10 MAY 23

- **If one door not locked closed on ground:**

  CAB PR INHIB BY DOORS

- **In all other cases:**

L2 Due to the slow closure of the outflow valve in manual pressurization mode and depending on the failure, the following procedure may not avoid a depressurization.

L1 CAB PR MODE SEL.....MAN
MAN VALVE SEL.....BOTH
MAN V/S CTL.....AS RQRD

L2 *Monitor cabin V/S and cabin altitude frequently and adjust as necessary.*
Maintain aircraft altitude at or above cabin altitude. It may take 10 s in manual mode before the crew notices a change of the outflow valve position.
The two safety valves limit ΔP to 8.85 PSI.

L1

CAUTION	Below FL 190, in the case of the cabin altitude is below -2 060 ft, the cabin altitude and the cabin differential pressure values may not be available for display on the CAB PRESS SD page in manual pressurization mode. As a result, maintain the MAN V/S CTL toggle switch in the UP position to increase the cabin altitude and recover the display.

Continued on the following page

CAB PR SYS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-CAB_PR-N-00019258.0001001 / 21 MAR 16

L12

STATUS

MAN CAB PR CTL:
TGT V/S: CLIMB 500 FT/MIN
TGT V/S: DES 300 FT/MIN

A/C FL	CAB ALT TGT
410	8 000
350	6 500
300	5 000
250	2500
< 200	0

- **DURING FINAL APPR:**

  MAN V/S CTL...FULL UP

  When on intermediate approach (below airfield pressure altitude + 2 500 ft), adjust ΔP = 0.
  When ΔP is zero, select FULL UP to fully open both outflow valves.

CAUTION	Check that ΔP is zero before opening the doors.

INOP SYS

CAB PR 1+2

CAB PR SYS 1+2 FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

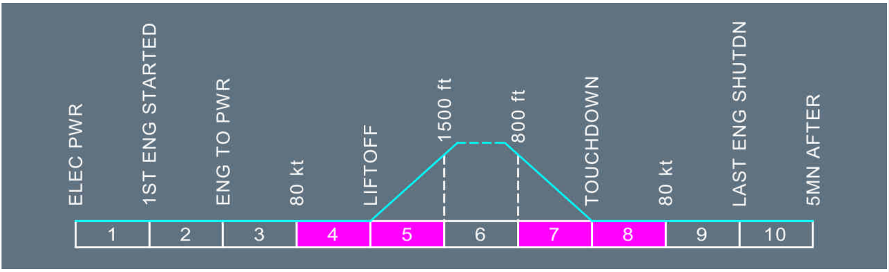
Ident.: PRO-ABN-CAB_PR-N-00017450.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both cabin pressure controllers are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

CAB PR SYS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-CAB_PR-N-00019257.0001001 / 10 MAY 23

- **If one door not locked closed on ground:**

  CAB PR INHIB BY DOORS

- **In all other cases:**

L2 Due to the slow closure of the outflow valve in manual pressurization mode and depending on the failure, the following procedure may not avoid a depressurization.

L1 MODE SEL....................MAN
MAN VALVE SEL....................BOTH
MAN V/S CTL....................AS RQRD

L2 *Monitor cabin V/S and cabin altitude frequently and adjust as necessary.*
Maintain aircraft altitude at or above cabin altitude. It may take 10 s in manual mode before the crew notices a change of the outflow valve position.
The two safety valves limit ΔP to 8.85 PSI.

L1

CAUTION	Below FL 190, in the case of the cabin altitude is below -2 060 ft, the cabin altitude and the cabin differential pressure values may not be available for display on the CAB PRESS SD page in manual pressurization mode. As a result, maintain the MAN V/S CTL toggle switch in the UP position to increase the cabin altitude and recover the display.

Continued on the following page

CAB PR SYS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-CAB_PR-N-00019258.0001001 / 21 MAR 16

L12

STATUS

MAN CAB PR CTL:
TGT V/S: CLIMB 500 FT/MIN
TGT V/S: DES 300 FT/MIN

A/C FL	CAB ALT TGT
410	8 000
350	6 500
300	5 000
250	2500
< 200	0

● **DURING FINAL APPR:**

MAN V/S CTL..FULL UP

When on intermediate approach (below airfield pressure altitude + 2 500 ft), adjust ΔP = 0.
When ΔP is zero, select FULL UP to fully open both outflow valves.

CAUTION	Check that ΔP is zero before opening the doors.

INOP SYS

CAB PR 1+2

COM ACARS 1(2)(1+2) FAULT ⩤

Applicable to: ALL

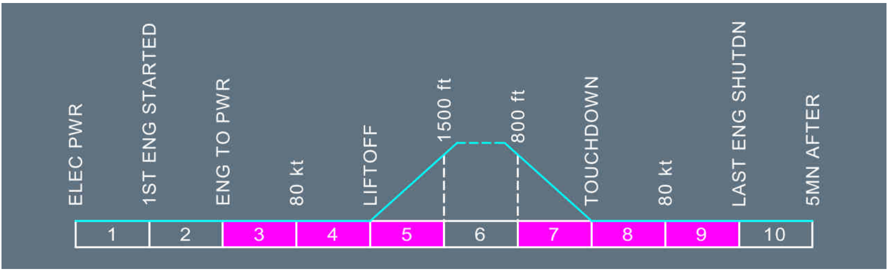
Ident.: PRO-ABN-COM-C-00017138.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure of ACARS.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COM-C-00017833.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COM-C-00009905.0001001 / 06 AUG 10

STATUS

INOP SYS

ACARS 1(2)(1+2)

COM CIDS 1+2 FAULT

Applicable to: ALL

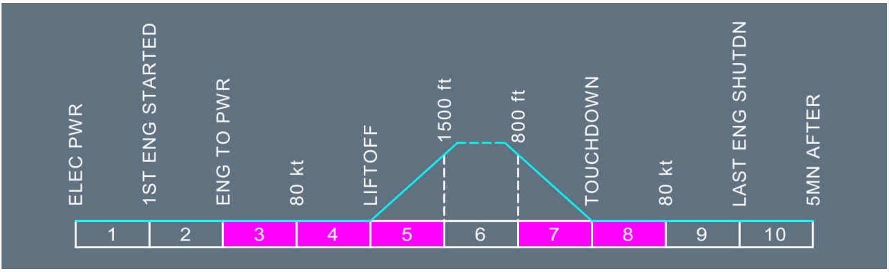
Ident.: PRO-ABN-COM-A-00017139.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a total loss of CIDS.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
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Ident.: PRO-ABN-COM-A-00009900.0001001 / 25 FEB 14

L2 Passenger address, cabin and flight crew interphone, service interphone, passenger signs, and communication with the lower deck and flight crew rest compartment ⊲ are inoperative.

L1 Crew awareness.

Ident.: PRO-ABN-COM-A-00009901.0001001 / 06 AUG 10

STATUS

INOP SYS

CIDS 1 + 2

COM CIDS PA FAULT

Applicable to: ALL

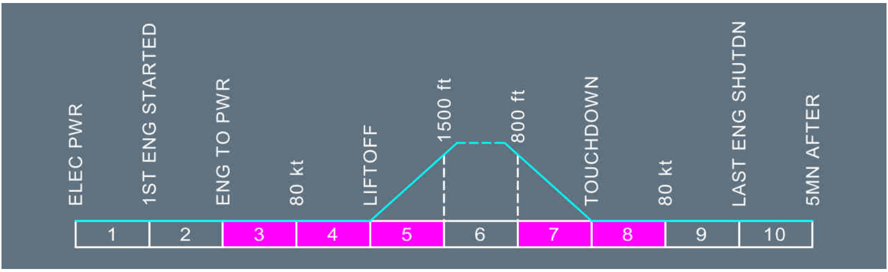
Ident.: PRO-ABN-COM-B-00017140.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of passenger address.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
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Ident.: PRO-ABN-COM-B-00009902.0001001 / 25 FEB 14

L2 Passenger address or cabin interphone is degraded or inoperative.

L1 Crew awareness.

Ident.: PRO-ABN-COM-B-00009903.0001001 / 06 AUG 10

STATUS

INOP SYS

CIDS PA

COM HF 1(2) DATA FAULT ⩤

Applicable to: ALL

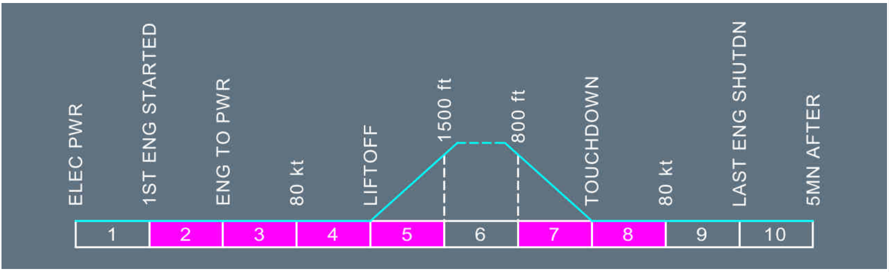
Ident.: PRO-ABN-COM-J-00017141.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when data communications via HF 1(2) are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-COM-J-00017837.0001001 / 21 MAR 16

Crew awareness.

COM SATCOM DATA FAULT ⩤

Applicable to: ALL

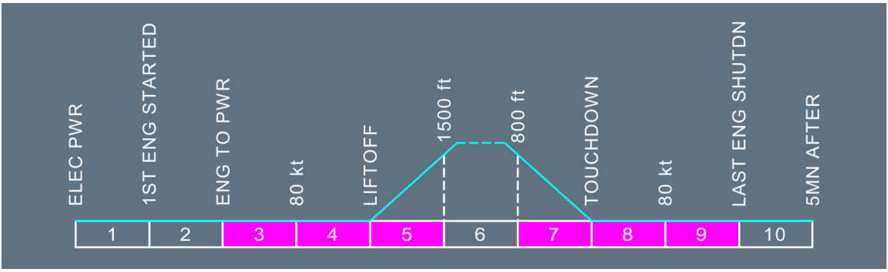
Ident.: PRO-ABN-COM-D-00017143.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when data communications via SATCOM are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COM-D-00017839.0001001 / 21 SEP 16

L2 Telephone transmissions are still available. ACARS ⩤ communications are inoperative.

L1 Crew awareness.

Ident.: PRO-ABN-COM-D-00009907.0001001 / 04 MAR 14

STATUS

INOP SYS

SATCOM DATA

COM SATCOM FAULT ◁

Applicable to: ALL

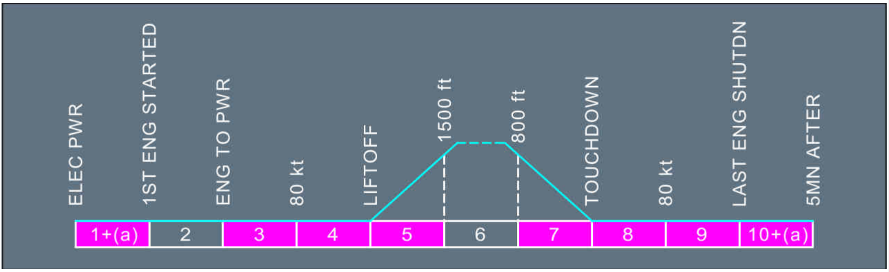
Ident.: PRO-ABN-COM-H-00017147.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when voice and data communications via SATCOM are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1+(a)
2
3
4
5
6
7
8
9
10+(a)

Note: *(a) This alert is inhibited in flight phases 1 and 10 when IRS are not aligned.*

Ident.: PRO-ABN-COM-H-00017840.0001001 / 21 MAR 16

L2 ACARS ◁ and telephone communications are inoperative.

L1 Crew awareness.

Ident.: PRO-ABN-COM-H-00015223.0001001 / 04 MAR 14

STATUS

INOP SYS

SATCOM

COM SATCOM VOICE FAULT

Applicable to: ALL

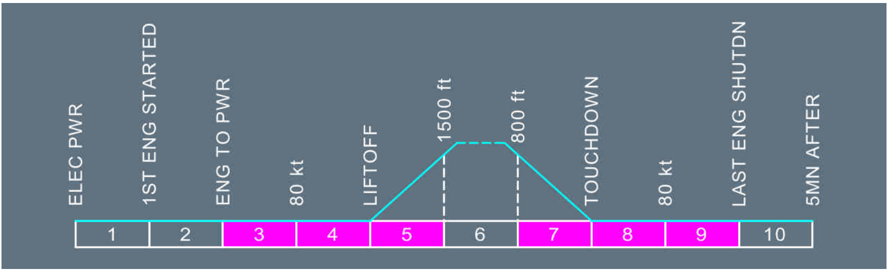
Ident.: PRO-ABN-COM-L-00017148.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when voice communications via SATCOM are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COM-L-00017850.0001001 / 21 MAR 16

L2 Telephone communications are inoperative. ACARS is still transmitted by the SATCOM.

L1 Crew awareness.

COM SINGLE PTT STUCK

Applicable to: ALL

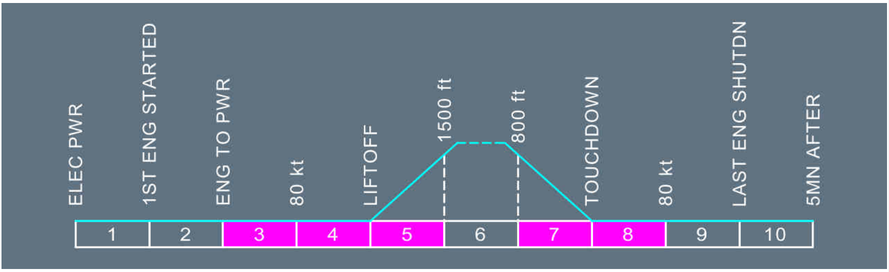
Ident.: PRO-ABN-COM-G-00017149.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when any PTT transmission selector is jammed in the transmit position for more than 40 s (VHF) or for more than 180 s (HF).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

COM SINGLE PTT STUCK (Cont'd)

Ident.: PRO-ABN-COM-G-00017841.0003001 / 06 MAR 17

- **DURING 20 s:**
  ALL PTT....CHECK RELEASED

ACP1 VHF 1(2)(3) TX....DESELECT
ACP1 HF 1(2) TX....DESELECT

- **IF UNSUCCESSFUL:**
  ACP2 VHF 1(2)(3) TX....DESELECT
  ACP2 HF 1(2) TX....DESELECT

- **IF UNSUCCESSFUL:**
  ACP3 VHF 1(2)(3) TX....DESELECT
  ACP3 HF 1(2) TX....DESELECT

When the ACP linked to the faulty PTT is detected, the previous ECAM actions are replaced by the following ones:

AUDIO SWTG....DO NOT USE

- **ON AFFECTED ACP:**
  ALL TX KEYS....DO NOT USE

- **ON ALL OTHER ACP:**
  ALL TX KEYS....AS RQRD

Ident.: PRO-ABN-COM-G-00014826.0001001 / 23 AUG 13

STATUS

AUDIO SWTG....DO NOT USE	**INOP SYS** SINGLE PTT

COM VHF 1(2)(3)/HF 1(2) EMITTING

Applicable to: ALL

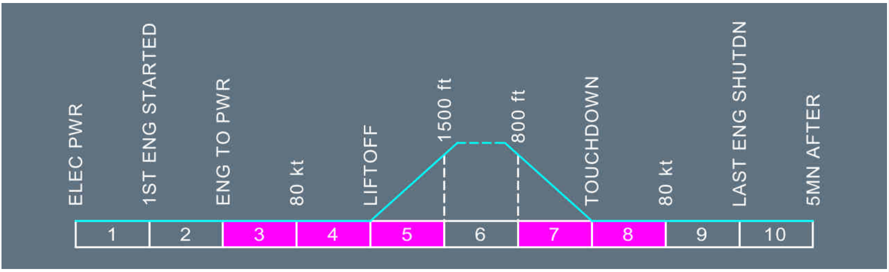
Ident.: PRO-ABN-COM-K-00017152.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when VHF transmitter emits more than 30 s or when HF transmitter emits more than 60 s.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COM-K-00017851.0001001 / 21 MAR 16

L2

1. If any Push To Talk (PTT) transmission selector (sidestick PTT , hand mike PTT , or ACP PTT switch) is jammed in the transmit position, try to release it in order to remove the caution.
2. If unsuccessful, deselect the identified failed VHF/HF transmission keys on the associated Audio Control Panel (ACP) to remove the caution. This ACP should only be used in reception mode. The associated PTT transmission selectors must not be used.

Note: *In this case, the ACP of the unaffected side may be used to recover the deselected VHF/HF channel.*

COM VHF 3 DATA FAULT ⊲

Applicable to: ALL

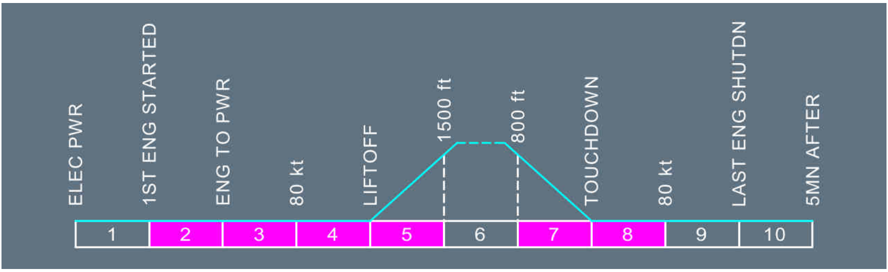
Ident.: PRO-ABN-COM-E-00017150.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when data communications via VHF 3 are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COM-E-00017852.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COM-E-00009910.0001001 / 06 AUG 10

STATUS

INOP SYS

VHF 3 DATA

Intentionally left blank

COND BBAND FAN FAULT

Applicable to: ALL

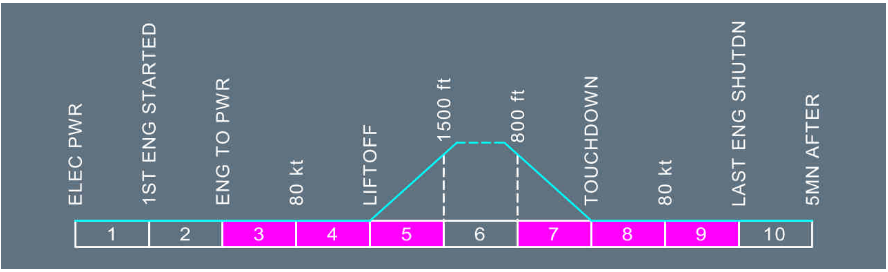
Ident.: PRO-ABN-COND-AH-00017491.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the Broadband Ventilation System is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AH-00019451.0001001 / 21 MAR 16

PAX BBAND..OFF

Ident.: PRO-ABN-COND-AH-00019443.0001001 / 21 MAR 16

STATUS

INOP SYS

BBAND FAN

COND BBAND VENT FAULT

Applicable to: ALL

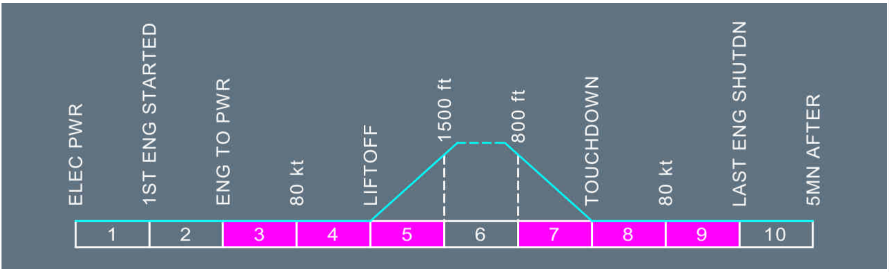
Ident.: PRO-ABN-COND-AU-00017492.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the Broadband Ventilation System is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AU-00019253.0001001 / 21 MAR 16

PAX BBAND..OFF

L2 *Except in electrical emergency configuration.*

Ident.: PRO-ABN-COND-AU-00019444.0001001 / 21 MAR 16

STATUS

INOP SYS

BBAND VENT

COND BULK(FWD) CRG HEAT FAULT

Applicable to: ALL

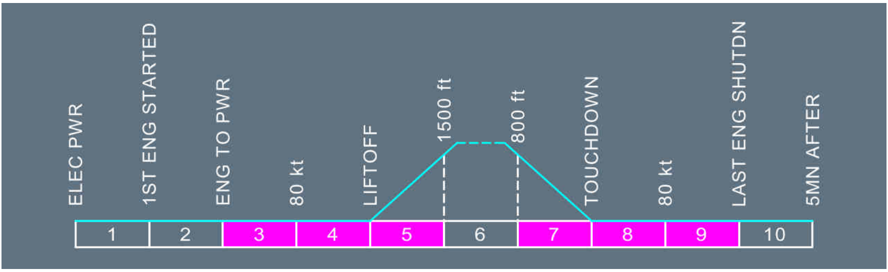
Ident.: PRO-ABN-COND-Z-00017468.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the bulk(forward) cargo compartment heating system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-Z-00018408.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COND-Z-00018409.0001001 / 21 MAR 16

STATUS

INOP SYS

BULK HEAT
FWD CRG TEMP

COND BULK CRG DUCT OVHT ⩤

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

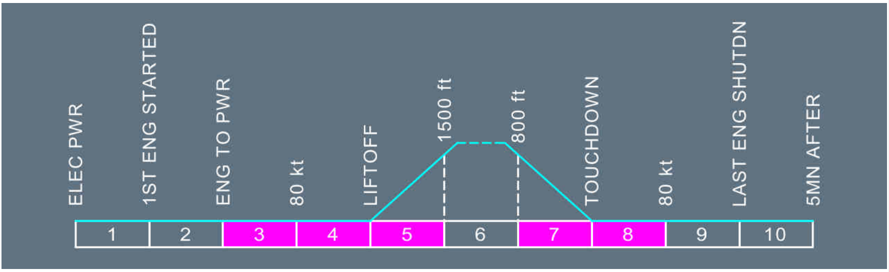
Ident.: PRO-ABN-COND-AF-00017474.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:
- The duct temperature rises above 88 °C, or
- The duct temperature rises above 80 °C four times during the same flight.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AF-00018410.0010001 / 16 MAY 17

BULK HOT AIR (IF NOT CLOSED AUTOMATICALLY)....................OFF

- **WHEN BULK CRG DUCT TEMP<70 DEG. C (158 DEG. F):**
  BULK HOT AIR.................................... OFF/ON

Ident.: PRO-ABN-COND-AF-00018411.0005001 / 16 MAY 17

STATUS

	INOP SYS
● **WHEN BULK CRG DUCT TEMP<70 DEG. C (158 DEG. F):** BULK HOT AIR....................OFF/ON	BULK HEAT

COND BULK CRG DUCT OVHT ⩤

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Ident.: PRO-ABN-COND-AF-00017474.0001001 / 21 MAR 16

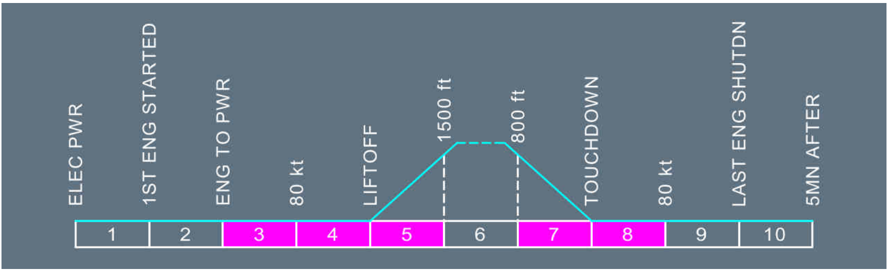
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when:
- The duct temperature rises above 88 °C, or
- The duct temperature rises above 80 °C four times during the same flight.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AF-00018410.0001001 / 21 MAR 16

BULK HOT AIR (IF NOT CLOSED AUTOMATICALLY).. OFF

- ● **WHEN BULK CRG DUCT TEMP<70 DEG C:**
  BULK HOT AIR.. OFF/ON

Ident.: PRO-ABN-COND-AF-00018411.0001001 / 21 MAR 16

STATUS

	INOP SYS
● **WHEN BULK CRG DUCT TEMP<70 DEG C :** BULK HOT AIR.. OFF/ON	BULK HEAT

COND BULK CRG ISOL FAULT

Applicable to: ALL

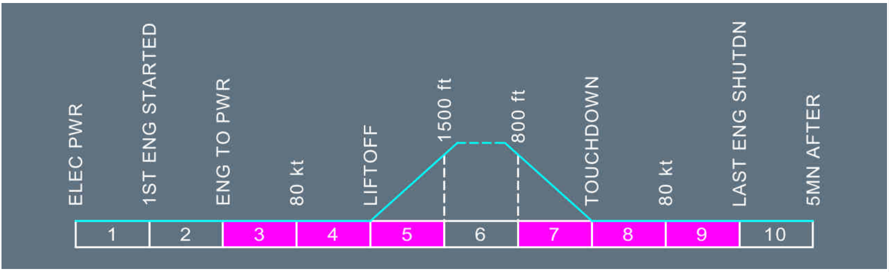
Ident.: PRO-ABN-COND-AQ-00017487.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the position of the bulk cargo compartment isolation valve disagrees with the commanded position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AQ-00018412.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COND-AQ-00018413.0001001 / 21 MAR 16

STATUS

INOP SYS

BULK VENT

COND BULK CRG VENT FAULT

Applicable to: ALL

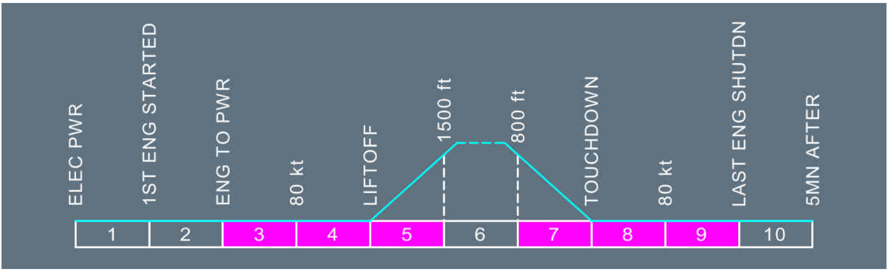
Ident.: PRO-ABN-COND-AR-00018945.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ventilation system of the bulk cargo compartment is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AR-00013365.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-COND-AR-00013366.0001001 / 18 MAR 11

STATUS

INOP SYS

BULK VENT

COND CAB REST ISOL FAULT ⩤

Applicable to: ALL

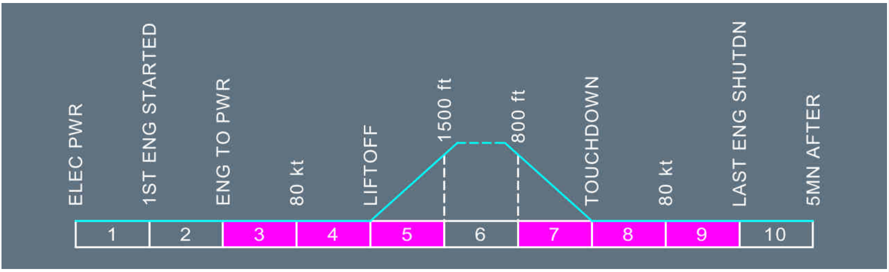
Ident.: PRO-ABN-COND-W-00017476.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the position of the cabin crew rest isolation valve disagrees with the commanded position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-W-00018219.0001001 / 21 MAR 16

Crew awareness.

COND DUCT OVHT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

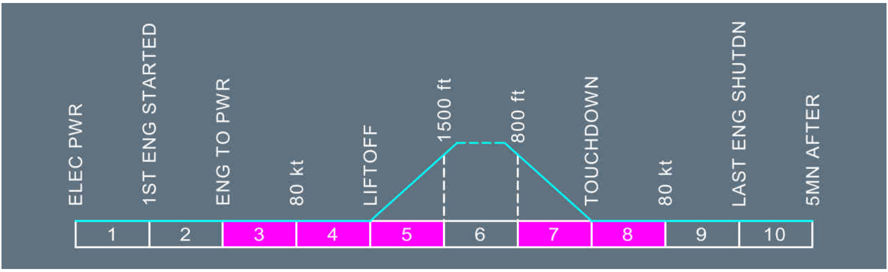
Ident.: PRO-ABN-COND-K-00017438.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert trigger when the duct temperature rises above 88 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-K-00018221.0009001 / 16 MAY 17

FWD CRG DUCT OVHT ◁✳ , OR
COCKPIT DUCT OVHT, OR
CABIN DUCT OVHT

HOT AIR (AFFECTED).. OFF

If not closed automatically.

- **IF HOT AIR STUCK OPEN:**
  PACK (AFFECTED)..OFF
- **WHEN DUCT TEMP<70 DEG. C (158 DEG. F):**
  HOT AIR (AFFECTED)... OFF THEN ON
  Hot air pressure regulating valve will reopen.
  PACK (AFFECTED)..ON

Continued on the following page

COND DUCT OVHT (Cont'd)

Ident.: PRO-ABN-COND-K-00018222.0006001 / 16 MAY 17

STATUS

- **WHEN DUCT TEMP < 70 DEG. C (158 DEG. F):**
  HOT AIR (AFFECTED)............................OFF THEN ON
  PACK (AFFECTED)..ON
- **On ground:**
  CAB TEMP REGUL DEGRADED

INOP SYS

FWD CRG TEMP ❄
CKPT TEMP (1)

(1) *(Only if sysTEM 2 AFFECTED)*

COND DUCT OVHT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

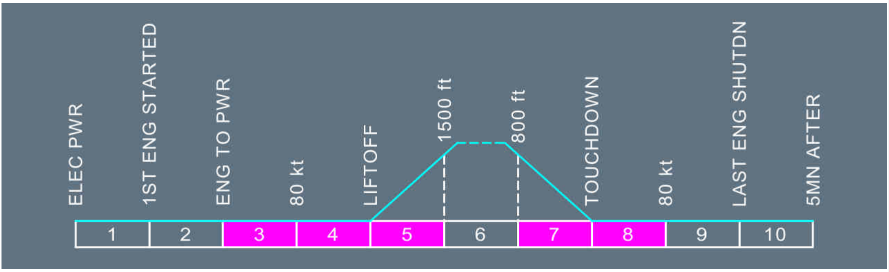
Ident.: PRO-ABN-COND-K-00017438.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert trigger when the duct temperature rises above 88 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

COND DUCT OVHT (Cont'd)

Ident.: PRO-ABN-COND-K-00018221.0001001 / 21 MAR 16

FWD CRG DUCT OVHT ◁ , OR
COCKPIT DUCT OVHT, OR
CABIN DUCT OVHT

HOT AIR (AFFECTED).. OFF

L2 *If not closed automatically.*

L1
- **IF HOT AIR STUCK OPEN:**

  PACK (AFFECTED).. OFF

- **WHEN DUCT TEMP < 70 DEG C:**

  HOT AIR (AFFECTED).. OFF THEN ON

  L2 *Hot air pressure regulating valve will reopen.*

  L1 PACK (AFFECTED).. ON

Ident.: PRO-ABN-COND-K-00018222.0001001 / 21 MAR 16

STATUS

- **WHEN DUCT TEMP < 70 DEG C:**

  HOT AIR (AFFECTED)........................ OFF THEN ON
  PACK (AFFECTED)........................ ON

- **On ground:**

  CAB TEMP REGUL DEGRADED

INOP SYS

FWD CRG TEMP ◁
CKPT TEMP (1)

(1) *(Only if sys 2 failed)*

COND FWD(AFT) CRG ISOL FAULT

Applicable to: ALL

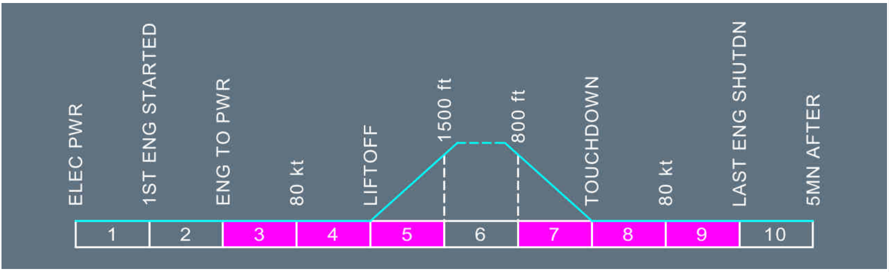
Ident.: PRO-ABN-COND-X-00017470.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the position of the forward(aft) cargo isolation valve disagrees with the commanded position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-X-00018457.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COND-X-00018458.0001001 / 21 MAR 16

STATUS

INOP SYS

FWD(AFT) CRG VENT
FWD CRG TEMP

COND FWD(AFT) CRG VENT FAULT ⩤

Applicable to: ALL

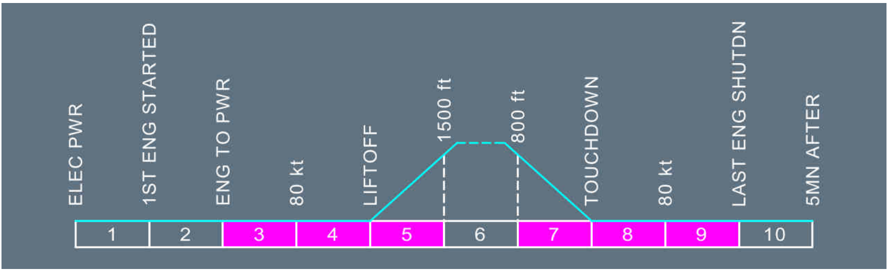
Ident.: PRO-ABN-COND-Y-00018953.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ventilation system of the forward(aft) cargo compartment is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-Y-00018459.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COND-Y-00018460.0003001 / 21 MAR 16

STATUS

	INOP SYS
FWD(AFT) CARGO VENT REDUCED	FWD(AFT) CRG VENT ⩤ FWD CRG TEMP ⩤

COND FWD CRG COOL FAULT ⪻

Applicable to: ALL

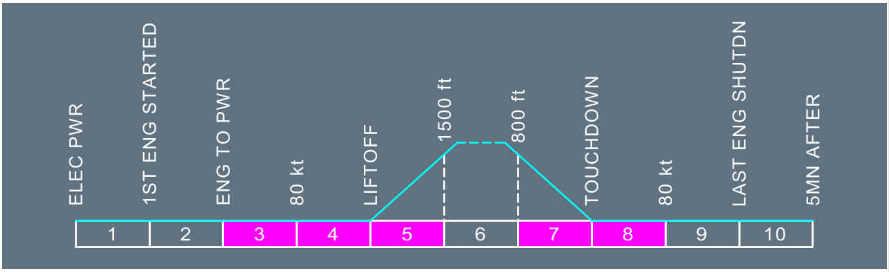
Ident.: PRO-ABN-COND-AB-00017472.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the cooling system of the forward cargo compartment is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AB-00018465.0001001 / 21 MAR 16

FWD CRG COOLING ⪻ ....OFF

Ident.: PRO-ABN-COND-AB-00018466.0001001 / 21 MAR 16

STATUS

INOP SYS

FWD CRG TEMP ⪻

COND IFE BAY VENT FAULT ⊲

Applicable to: ALL

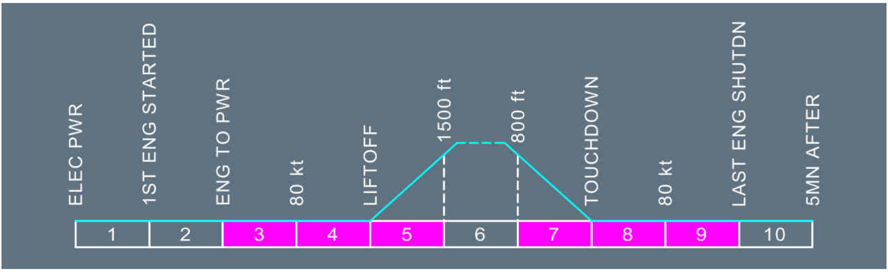
Ident.: PRO-ABN-COND-AV-00017479.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ventilation of the IFE bay is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-AV-00018227.0001001 / 21 MAR 16

IFEC ⊲ ....OFF

- **If IFEC pb-sw is not installed:**
  PAX SYS..OFF

Ident.: PRO-ABN-COND-AV-00015766.0001001 / 05 JAN 15

STATUS

INOP SYS

IFE BAY VENT

COND L(R)(L+R) CAB VENT FAULT

Applicable to: ALL

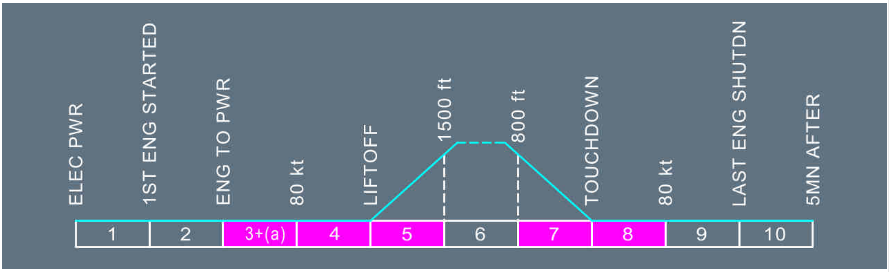
Ident.: PRO-ABN-COND-O-00017441.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the associated recirculation fan or recirculation valve is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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3+(a)
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Note: *(a) Not inhibited for dual failure.*

Ident.: PRO-ABN-COND-O-00018229.0001001 / 21 MAR 16

PACK FLOW...HI

Ident.: PRO-ABN-COND-O-00018230.0001001 / 21 MAR 16

STATUS

INOP SYS

L(R)(L+R) CAB VENT

COND LAV+GAL VENT FAULT ⩤

Applicable to: ALL

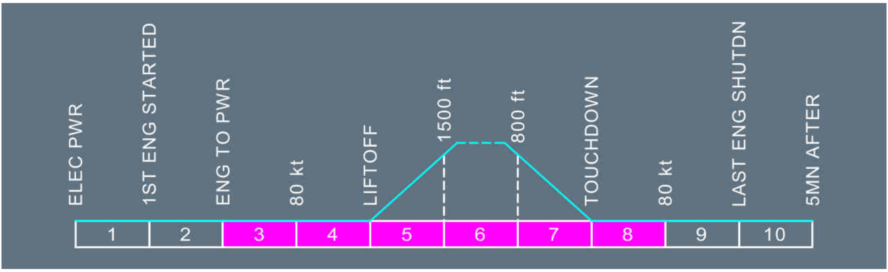
Ident.: PRO-ABN-COND-AX-00017442.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the lavatory and galley ventilation is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

COND LAV+GAL VENT FAULT ◁ (Cont'd)

Ident.: PRO-ABN-COND-AX-00018231.0001001 / 21 MAR 16

L2 On ground, cabin zone temperature sensors are normally ventilated by air extracted by the fan. Therefore, when the fan is faulty, the cabin zone inlet duct temperature is constant and no cabin temperature indication is available on the ECAM. Moreover, cockpit temperature regulation is normal.
Failure of the lavatories and galleys ventilation system also results in the loss of the Video Control Center ◁ (VCC) ventilation on ground.

L1 VCC ◁ .... OFF
VCC AVAIL IN FLT ◁

L2 *Note:* *When in flight, the VCC pb-sw ◁ can be switched on. To recover the IFE ◁ , do a reset of the PAX SYS pb-sw ◁ .*

L1
- **If VCC pb-sw is not installed:**
  PAX SYS...OFF
  PAX SYS AVAIL IN FLT

L2 *Note:* *When in flight, the PAX SYS pb-sw can be switched on.*

Ident.: PRO-ABN-COND-AX-00018232.0001001 / 21 MAR 16

STATUS

VCC ◁ AVAIL IN FLT
PAX SYS ◁ AVAIL IN FLT
- **On ground:**
  CAB TEMP REGUL DEGRADED

INOP SYS

LAV+GAL VENT

COND VENT SYS FAULT

Applicable to: ALL

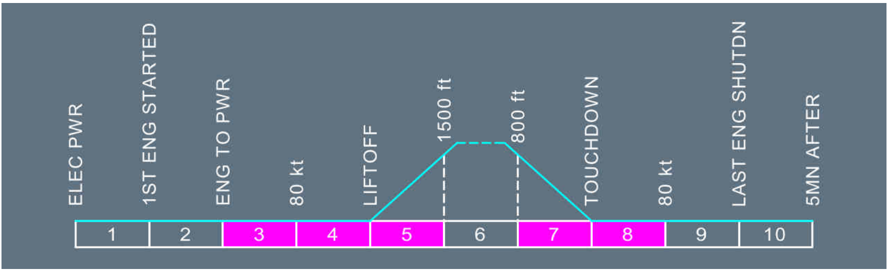
Ident.: PRO-ABN-COND-BA-00017467.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ventilation controller is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-BA-00018255.0001001 / 21 MAR 16

L2 The failure of the ventilation controller leads to the loss of ventilation in the galley, the cargo and the In-Flight Entertainment Center . On ground, this failure also leads to the loss of the Video Control Center ventilation.

L1 PACK FLOW.....HI
IFEC .....OFF
VCC .....OFF
VCC AVAIL IN FLT

L2 Note: *In flight, the VCC pb-sw can be switched on. To recover the IFE , do a reset of the PAX SYS pb-sw .*

L1
- **If IFEC and VCC are not installed:**

  PAX SYS.....OFF
  PAX SYS AVAIL IN FLT

Continued on the following page

COND VENT SYS FAULT ◁ (Cont'd)

Ident.: PRO-ABN-COND-BA-00018256.0001001 / 21 MAR 16

L12

STATUS

- **On ground:**
  CAB TEMP REGUL DEGRADED
  Cabin temperature sensors are not ventilated.

VCC ◁ AVAIL IN FLIGHT

See (1)

PAX SYS ◁ AVAIL IN FLIGHT

INOP SYS

CRG VENT
CRG COND
ALL CAB FANS
LAV+GAL VENT
IFE BAY VENT

(1) Note: *In flight, the VCC pb-sw ◁ can be switched on. To recover the IFE ◁, do a reset of the PAX SYS pb-sw ◁ .*

COND ZONE CTLR 1(2) FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

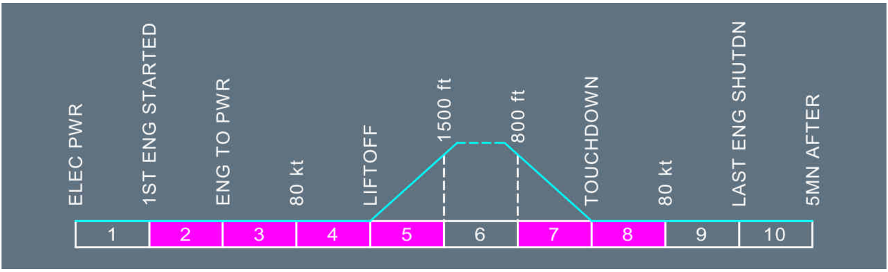
Ident.: PRO-ABN-COND-I-00017436.0003001 / 29 NOV 19

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one channel of the zone controller is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-I-00018266.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COND-I-00018267.0001001 / 21 MAR 16

STATUS

INOP SYS

ZONE CTLR 1(2)

COND ZONE CTLR 1(2) FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

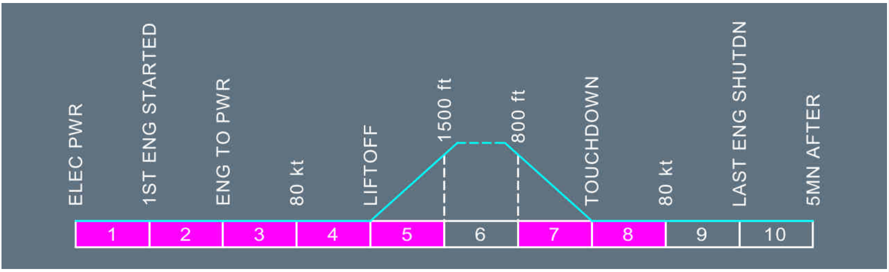
Ident.: PRO-ABN-COND-I-00017436.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one channel of the zone controller is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-I-00018266.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-COND-I-00018267.0001001 / 21 MAR 16

STATUS

INOP SYS

ZONE CTLR 1(2)

COND ZONE REGUL FAULT

Applicable to: ALL

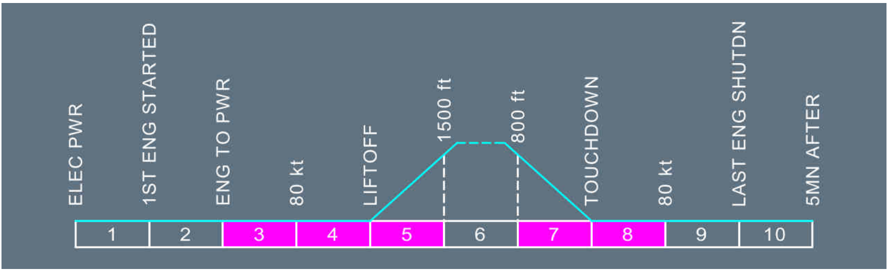
Ident.: PRO-ABN-COND-J-00017437.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the zone controller is failed, or hot air systems 1 and 2 are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-COND-J-00018270.0003001 / 21 MAR 16

- **If all engines at high idle:**
  ENG HI IDLE
- **If all engines not at high idle:**
  ENG (AFFECTED) HI IDLE

Continued on the following page

COND ZONE REGUL FAULT (Cont'd)

Ident.: PRO-ABN-COND-J-00018271.0003001 / 21 MAR 16

L12

STATUS

- **On ground:**
  CAB TEMP REGUL DEGRADED

PACKS AT FIXED TEMP

See (1)

- **If all engines at high idle:**
  ENG HI IDLE
- **If all engines not at high idle:**
  ENG (affected) HI IDLE

INOP SYS

ZONE REGUL
FWD CRG TEMP ◁

(1) *The packs are controlled to deliver a fixed temperature of 20 °C (68 °F). Pack flow and zone temperature selections are lost.*

CONFIG L(R) SIDESTICK FAULT
(BY TAKE OVER)

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AI-00019385.0001001 / 29 JUN 16

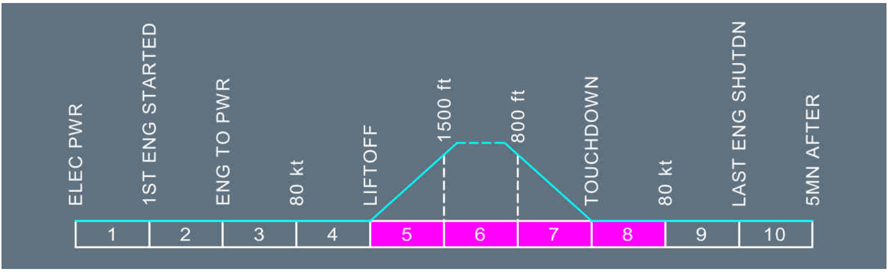
ANNUNCIATIONS

Triggering Conditions:

L2 If left or right sidestick is inoperative (deactivated by takeover pb), this alert triggers:

- when the thrust levers are set at T.O or FLEX T.O, or
- when pressing T.O CONFIG pb.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CONFIG-AI-00019032.0001001 / 21 MAR 16

L (R) TAKE OVER.. PRESS

L2 *The affected stick becomes operative.*

CONFIG PARK BRK ON

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AB-00018133.0002001 / 21 MAR 16

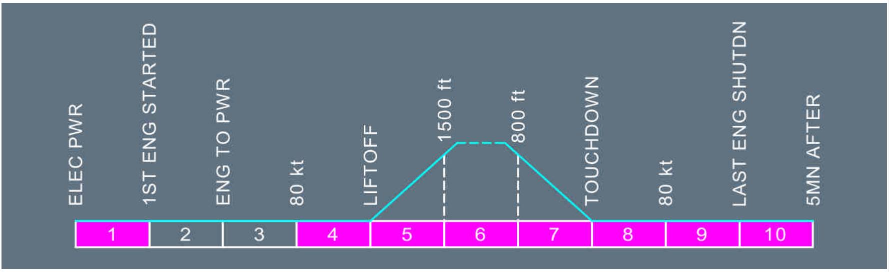
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- The parking brake is ON, and
- The thrust levers are set to the TO or FLX TO power position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CONFIG-AB-00010791.0001001 / 25 FEB 14

Crew awareness.

L2 Check that the PARK BRK handle is in the OFF position. If the warning stays on, check that the brake pressure is at 0 on the BRAKES PRESSURE indicator.

CONFIG PITCH TRIM NOT IN T.O RANGE

Applicable to: ALL

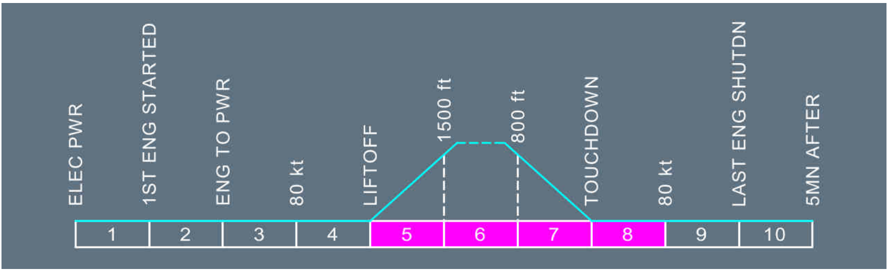
Ident.: PRO-ABN-CONFIG-AJ-00019386.0006001 / 11 JUL 16

ANNUNCIATIONS

Triggering Conditions:

L2 The alert triggers, if the pitch trim is not in T.O configuration (-7.5 °, +0.2 °), when the flight crew:
- Sets the thrust levers to T.O or FLEX T.O, or
- Presses the T.O CONFIG pb.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CONFIG-AJ-00010375.0001001 / 25 FEB 14

Crew awareness.

CONFIG RUD TRIM NOT IN T.O RANGE

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AK-00019390.0003001 / 13 JUL 16

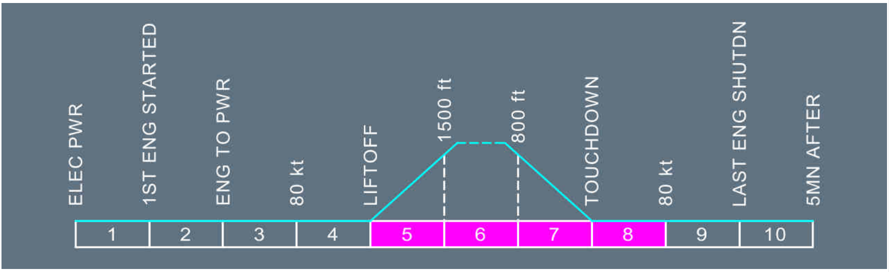
ANNUNCIATIONS

Triggering Conditions:

L2 If the RUD TRIM is not in T.O configuration (±3.5 °), the alert triggers:

- when thrust levers are set at T.O or FLEX T.O, or
- when pressing T.O CONFIG pb.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CONFIG-AK-00010403.0001001 / 25 FEB 14

Crew awareness.

CONFIG SLATS (FLAPS) NOT IN T.O CONFIG

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AL-00019392.0001001 / 21 MAR 16

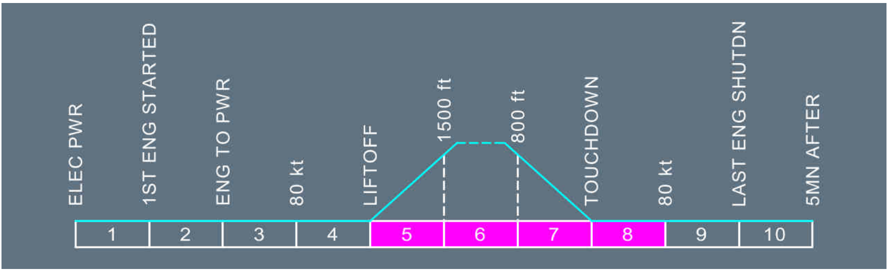
ANNUNCIATIONS

Triggering Conditions:

L2 If slats or flaps are not in takeoff configuration, this alert triggers:

- when thrust levers are set to T.O, or to FLEX TO, or
- when depressing the T.O CONFIG pb.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CONFIG-AL-00010356.0001001 / 25 FEB 14

Crew awareness.

CONFIG SPD BRK NOT RETRACTED

Applicable to: ALL

Ident.: PRO-ABN-CONFIG-AM-00019394.0001001 / 21 MAR 16

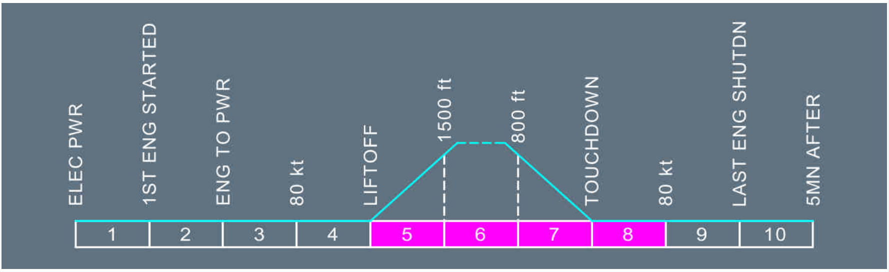
ANNUNCIATIONS

Triggering Conditions:

L2 If the speed brakes are not retracted, the alert triggers:

- when thrust levers are set at T.O or FLEX T.O, or
- when pressing T.O CONFIG pb.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-CONFIG-AM-00010385.0001001 / 25 FEB 14

Crew awareness.

DATALINK ATC FAULT

Applicable to: ALL

Ident.: PRO-ABN-DATALINK-B-00017247.0001001 / 21 MAR 16

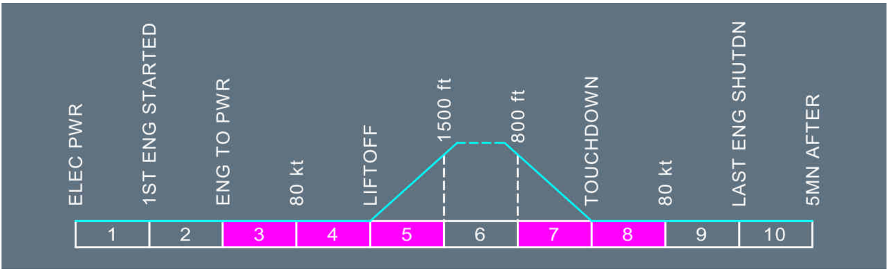
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when:
- The ATC datalink communications are failed, or
- The ATC datalink application is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DATALINK-B-00019259.0001001 / 21 MAR 16

Crew awareness.

ATC COM VOICE ONLY

Ident.: PRO-ABN-DATALINK-B-00019260.0001001 / 21 MAR 16

STATUS

	INOP SYS
ATC COM VOICE ONLY	DATALINK ATC

DATALINK ATSU FAULT

Applicable to: ALL

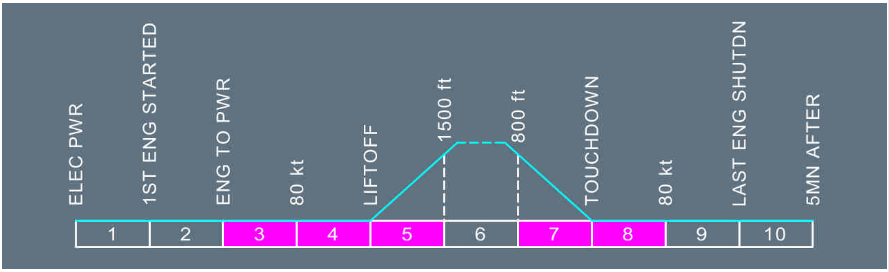
Ident.: PRO-ABN-DATALINK-A-00017248.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure in ATSU initialization associated with ATSU INIT FAULT ECAM message.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DATALINK-A-00019261.0003001 / 01 JUL 16

Crew awareness.

ATSU INIT FAULT

ATC COM VOICE ONLY

Ident.: PRO-ABN-DATALINK-A-00019262.0001001 / 21 MAR 16

STATUS

ATC COM VOICE ONLY
COMPANY COM VOICE ONLY

INOP SYS

ATSU
DATALINK ATC
DATA COMPANY

DATALINK COMPANY FAULT

Applicable to: ALL

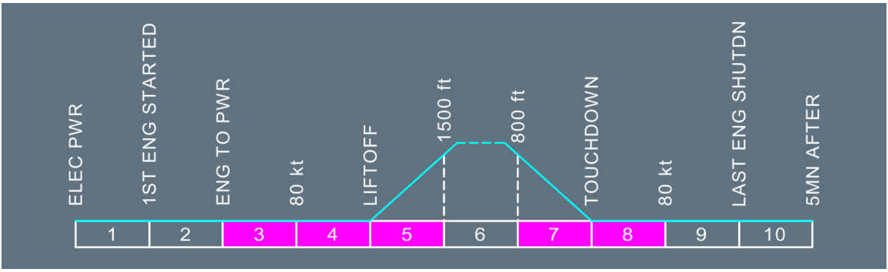
Ident.: PRO-ABN-DATALINK-C-00017249.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AOC datalink communications are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DATALINK-C-00010845.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-DATALINK-C-00010846.0001001 / 05 AUG 10

STATUS

INOP SYS

DATA COMPANY

Intentionally left blank

[QRH] COCKPIT DOOR FAULT

Ident.: PRO-ABN-DOOR-00010335.0006001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

CKPT DOOR CONT [OVHD PANEL] .... CHECK

- **If two or more STRIKE status lights on (C/Bs tripped):**

  COCKPIT DOOR.. OPEN
  [40 MQ PANEL] C/Bs..REENGAGE

  Note: *Only one re-engagement should be attempted. Further C/B tripping requires maintenance action to determine the nature of the failure.*

  COCKPIT DOOR sw.. UNLOCK 10 s THEN NORM

  - **If reset unsuccessful:** COCKPIT DOOR NOT INTRUSION PROOF.

- **If two CHAN status lights on:**

  AUTOMATIC LATCH RELEASE NOT AVAILABLE AFTER COCKPIT DECOMPRESSION.

- **If no status light on:**

  TO UNLOCK THE DOOR: COCKPIT DOOR HANDLE AVAIL

Note: *In case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's CKPT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.*

[QRH] COCKPIT DOOR FAULT

Ident.: PRO-ABN-DOOR-00010335.0007001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

CKPT DOOR CONT NORMAL [OVHD PANEL]........ CHECK

- **If two or more STRIKE status lights on (C/Bs tripped):**
  COCKPIT DOOR........ OPEN
  [40 MQ PANEL] C/Bs........ REENGAGE

  Note: *Only one re-engagement should be attempted. Further C/B tripping requires maintenance action to determine the nature of the failure.*

  COCKPIT DOOR sw........ UNLOCK 10 s THEN NORM
  - **If reset unsuccessful:** COCKPIT DOOR NOT INTRUSION PROOF.

- **If no status light on, or if two CHAN status lights on:**
  [CKPT DOOR BK UP PANEL] LKG SYS sw........ BK UP
  When the CDLS is switched to the Backup Control Unit, the FAULT light goes off and the Backup Control Unit controls the CDLS. Therefore:
  - **To unlock the cockpit door:**
    [CKPT DOOR BK UP PANEL] CTL pb........ PRESS and MAINTAIN

Note: *In case of a DC BUS 2 fault, no FAULT indication appears on the center pedestal's CKPT DOOR panel. The CDLS is not electrically-supplied, and is inoperative.*

DOOR AVIONIC
(IN FLIGHT)

Applicable to: ALL

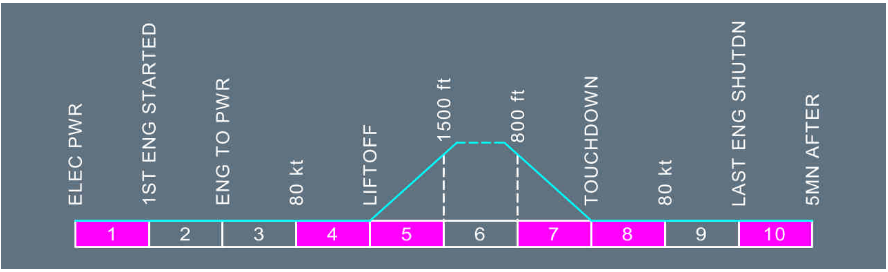
Ident.: PRO-ABN-DOOR-H-00017760.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the avionic door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-H-00010128.0002001 / 21 MAR 17

L2 No crew action is required, as long as cabin pressure is normal.

L1 ● **IF ABN CAB V/S:**

MAX FL...100/MEA-MORA

L2 *Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.*

If the door warning is accompanied by an abnormal increase in cabin altitude, the flight crew must reduce cabin ΔP and altitude by descending.

Cabin and Avionic doors are of the plug type. Therefore, full depressurization is not recommended.

Continued on the following page

DOOR AVIONIC (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-DOOR-H-00010129.0002001 / 21 MAR 17

STATUS

- **IF ABN CAB V/S :**
  MAX FL.. 100/MEA-MORA

DOOR AVIONIC
(ON GROUND)

Applicable to: ALL

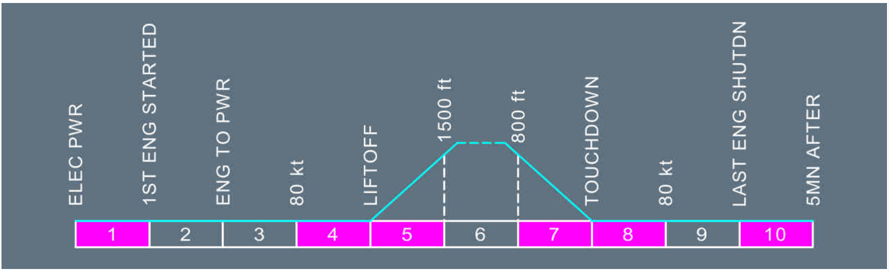
Ident.: PRO-ABN-DOOR-G-00018707.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the avionic door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-G-00010126.0002001 / 08 JUL 15

Crew awareness.

DOOR FWD(AFT)(BULK) CARGO
(IN FLIGHT)

Applicable to: ALL

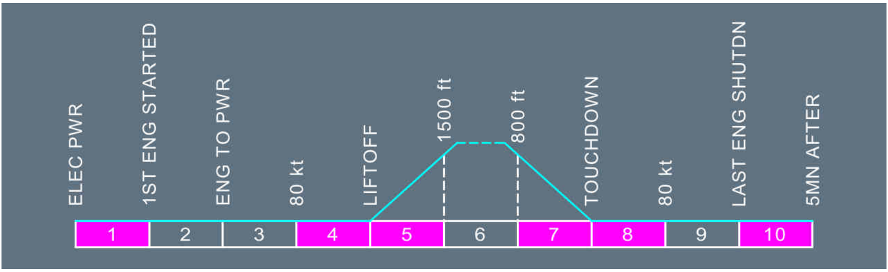
Ident.: PRO-ABN-DOOR-F-00018725.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FWD(AFT)(BULK) cargo door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-F-00017685.0002001 / 21 MAR 17

L2 No crew action is required, as long as cabin pressure is normal.

L1 ● **IF ABN CAB V/S:**

MAX FL 100/MEA-MORA

L2 *Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.*

If the door warning is accompanied by an abnormal increase in cabin altitude, the flight crew must reduce cabin ΔP and altitude by descending.

Cabin and Avionic doors are of the plug type. Therefore, full depressurization is not recommended.

Continued on the following page

DOOR FWD(AFT)(BULK) CARGO (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-DOOR-F-00017686.0002001 / 21 MAR 17

STATUS

- **IF ABN CAB V/S :**
  MAX FL...100/MEA-MORA

DOOR FWD(AFT)(BULK) CARGO
(ON GROUND)

Applicable to: ALL

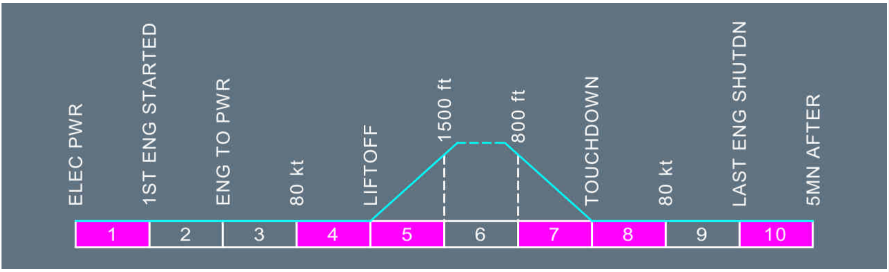
Ident.: PRO-ABN-DOOR-E-00017761.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FWD(AFT)(BULK) cargo door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-E-00017587.0001001 / 21 MAR 16

L2 Prior to taxi-out, the FWD(AFT) cargo door warning can be confirmed by checking the visual indicator flags on the base of the door.

L1 PACKS + CAB PR NOT AVAIL

Continued on the following page

DOOR FWD(AFT)(BULK) CARGO (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-DOOR-E-00017588.0001001 / 21 MAR 16

STATUS

INOP SYS

CAB PR 1+2
PACK 1+2

DOOR L(R) EMER EXIT
(IN FLIGHT)

Applicable to: ALL

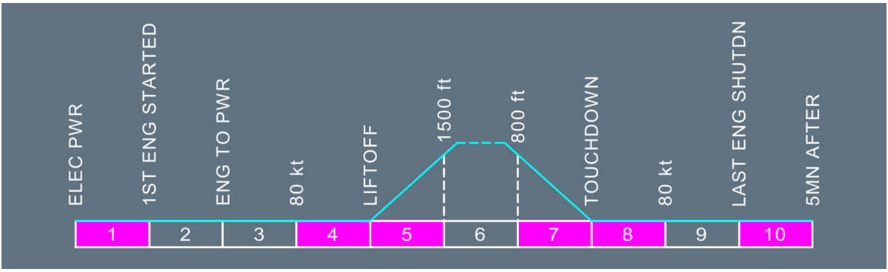
Ident.: PRO-ABN-DOOR-D-00018727.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the L(R) emergency exit door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

DOOR L(R) EMER EXIT (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-DOOR-D-00017585.0002001 / 21 MAR 17

L2 No crew action is required, as long as cabin pressure is normal.

L1 ● **IF ABN CAB V/S:**

MAX FL....................100/MEA-MORA

L2 *Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.*

If the door warning is accompanied by an abnormal increase in cabin altitude, the flight crew must reduce cabin ΔP and altitude by descending.

Cabin and Avionic doors are of the plug type. Therefore, full depressurization is not recommended.

Ident.: PRO-ABN-DOOR-D-00017586.0002001 / 21 MAR 17

STATUS

● **IF ABN CAB V/S :**

MAX FL....................100/MEA-MORA

DOOR L(R) EMER EXIT
(ON GROUND)

Applicable to: ALL

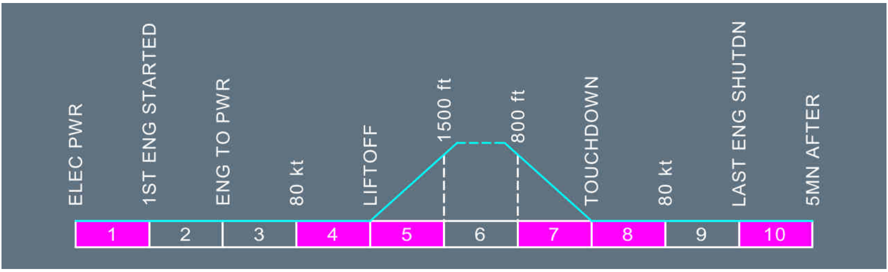
Ident.: PRO-ABN-DOOR-C-00017762.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the L(R) emergency exit door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-C-00017570.0001001 / 21 MAR 16

L2 The crew may confirm a cabin door warning by checking the visual indicator on the door.

L1 PACKS + CAB PR NOT AVAIL

Ident.: PRO-ABN-DOOR-C-00017571.0001001 / 21 MAR 16

STATUS

INOP SYS

CAB PR 1+2
PACK 1+2

DOOR L(R) FWD(MID)(AFT) CABIN
(IN FLIGHT)

Applicable to: ALL

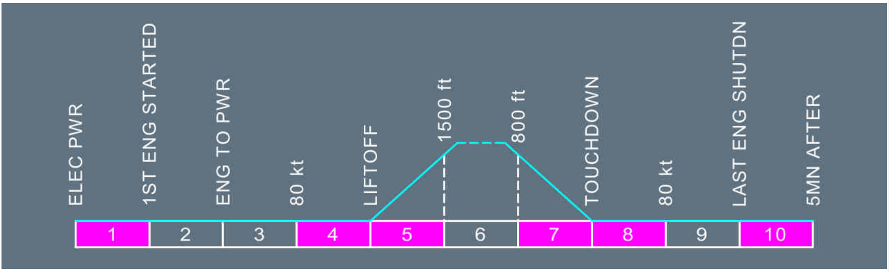
Ident.: PRO-ABN-DOOR-B-00018728.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the L(R) FWD(MID)(AFT) cabin door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-B-00017553.0002001 / 21 MAR 17

L2 No crew action is required, as long as cabin pressure is normal.

L1 ● **IF ABN CAB V/S:**

MAX FL..100/MEA-MORA

L2 *Limit maximum flight level to FL 100, MEA-MORA, or minimum obstacle clearance altitude.*

If the door warning is accompanied by an abnormal increase in cabin altitude, the flight crew must reduce cabin ΔP and altitude by descending.

Cabin and Avionic doors are of the plug type. Therefore, full depressurization is not recommended.

Continued on the following page

DOOR L(R) FWD(MID)(AFT) CABIN (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-DOOR-B-00017554.0002001 / 21 MAR 17

STATUS

- **IF ABN CAB V/S :**

  MAX FL..100/MEA-MORA

DOOR L(R) FWD(MID)(AFT) CABIN
(ON GROUND)

Applicable to: ALL

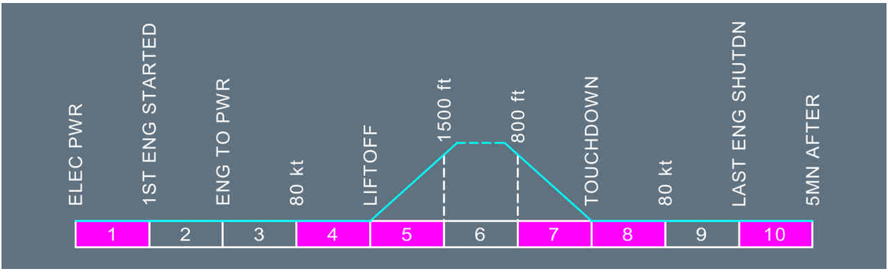
Ident.: PRO-ABN-DOOR-A-00017763.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the L(R) FWD(MID)(AFT) door is not detected closed by the proximity sensors.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-A-00017549.0001001 / 21 MAR 16

L2 The crew may confirm a cabin door warning by checking the visual indicator on the door.

L1 PACKS + CAB PR NOT AVAIL

Continued on the following page

DOOR L(R) FWD(MID)(AFT) CABIN (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-DOOR-A-00017550.0001001 / 21 MAR 16

STATUS

INOP SYS

CAB PR 1+2
PACK 1+2

DOOR POS DET 1(2)

Applicable to: ALL

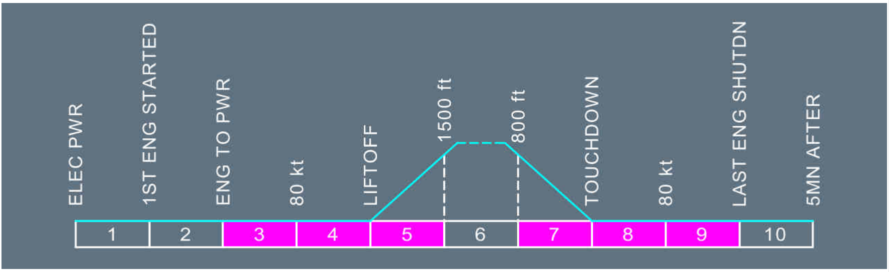
Ident.: PRO-ABN-DOOR-L-00017764.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one PSCU channel is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-L-00010134.0001001 / 21 MAR 16

- **On ground before takeoff:**
  PACKS + CAB PR NOT AVAIL

Continued on the following page

DOOR POS DET 1(2) (Cont'd)

Ident.: PRO-ABN-DOOR-L-00010135.0001001 / 06 AUG 10

STATUS

INOP SYS

CAB PR 1+2
PACK 1+2
DOOR DET 1(2)

DOOR POS DET 1+2

Applicable to: ALL

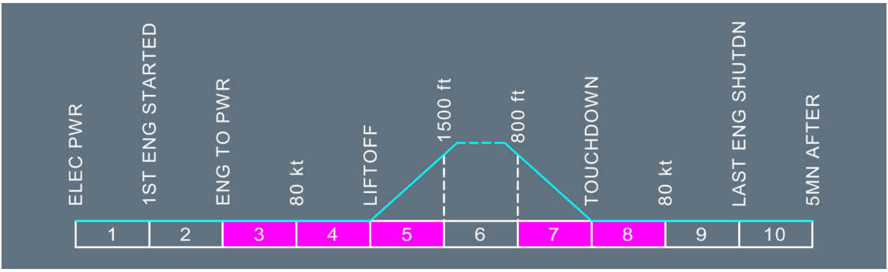
Ident.: PRO-ABN-DOOR-M-00017765.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both PSCU channels are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-DOOR-M-00010136.0001001 / 21 MAR 16

- **On ground before takeoff:**
  PACKS + CAB PR NOT AVAIL

Continued on the following page

DOOR POS DET 1+2 (Cont'd)

Ident.: PRO-ABN-DOOR-M-00010137.0001001 / 06 AUG 10

STATUS

INOP SYS

CAB PR 1+2
PACK 1+2
DOORS DET

[QRH] DISPLAY UNIT FAILURE

Ident.: PRO-ABN-EIS-00020989.0003001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

- **If DU blank (with or without large F), or distorted, or brightness reduced to minimum:**

  DU brightness knob (affected DU)..........OFF THEN ON

  Display recovers after 10 s.

  - **If unsuccessful:**

    DU brightness knob (affected DU)..........AS RQRD

    The DU can be switched off.

    CONSIDER ECAM/ND XFR

    CONSIDER PFD/ND XFR

- **If INVALID DISPLAY UNIT message displayed:**

  This may be caused by a DU failure.

  WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

  - **If DU not recovered:**

    DU brightness knob (affected DU)..........AS RQRD

    The DU can be switched off.

- **If INVALID DATA message displayed (not on all DUs):**

  This failure may be due to a DMC FAULT, or a communication interruption between the DMC and DU.

  CONSIDER DMC SWITCHING (EFIS OR ECAM)

  - **If unsuccessful:**

    DU brightness knob (affected DU)..........OFF THEN ON

    Note: The ND display may disappear in case too many waypoints and associated information are displayed. Reduce ND range, or deselect WPT or CSTR, and the ND display may automatically recover after about 30 s.

- **If INVALID DATA message displayed on all DUs:**

  AP, A/THR AND MCDU NAVIGATION DATA AVAILABLE

  WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

  - **If one or more DUs not recovered:**

    DUs brightness knob (all affected DUs)..........OFF

    WAIT AT LEAST 40 s

Continued on the following page

[QRH] DISPLAY UNIT FAILURE (Cont'd)

DU brightness knob (one by one).. ON

- **If INVALID DATA message displayed on all DUs, when switching a given DU back ON:**

  FAULTY DU brightness knob.. OFF AND KEEP OFF

  REPEAT PROCEDURE

  Repeat the procedure starting at: If INVALID DATA message displayed on all DUs.

- **If INVALID DATA message displayed on ECAM DUs (E/WD and SD):**

  ECAM DMC SWITCHING...2

  This action permits the recovery of both ECAM DUs.

- **If inversion of E/WD and SD:**

  ECAM UPPER DISPLAY brightness knob..OFF THEN ON

  The action on the ECAM LOWER DISPLAY brightness knob produces the same effect.

[QRH] DISPLAY UNIT FAILURE

Ident.: PRO-ABN-EIS-00020989.0002001 / 28 MAY 20
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

■ **If DU blank (with or without large F), or distorted:**

DU brightness knob (affected DU)..AS RQRD

The DU can be switched off.

CONSIDER ECAM/ND XFR

CONSIDER PFD/ND XFR

■ **If INVALID DISPLAY UNIT message displayed:**

This may be caused by a DU failure.

WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

- **If DU not recovered:**

  DU brightness knob (affected DU)..AS RQRD

  The DU can be switched off.

■ **If INVALID DATA message displayed (not on all DUs):**

This failure may be due to a DMC FAULT, or a communication interruption between the DMC and DU.

CONSIDER DMC SWITCHING (EFIS OR ECAM)

- **If unsuccessful:**

  DU brightness knob (affected DU)..OFF THEN ON

  Note: *The ND display may disappear in case too many waypoints and associated information are displayed. Reduce ND range, or deselect WPT or CSTR, and the ND display may automatically recover, after about 30 s.*

■ **If INVALID DATA message displayed on all DUs:**

AP, A/THR AND MCDU NAVIGATION DATA AVAILABLE

WAIT AT LEAST 40 s FOR AUTOMATIC DU RECOVERY

- **If one or more DUs not recovered:**

  DUs brightness knob (all affected DUs)..OFF

  WAIT AT LEAST 40 s

  DUs brightness knob (one by one)..ON

Continued on the following page

[QRH] DISPLAY UNIT FAILURE (Cont'd)

- **If INVALID DATA message displayed on all DUs, when switching a given DU back ON:**

  FAULTY DU brightness knob.. OFF AND KEEP OFF

  REPEAT PROCEDURE

  Repeat the procedure starting at: If INVALID DATA message displayed on all DUs.

■ **If INVALID DATA message displayed on the ECAM DUs (E/WD and SD):**

ECAM DMC SWITCHING..2

This action permits the recovery of both ECAM DUs.

■ **If inversion of E/WD and SD:**

ECAM UPPER DISPLAY brightness knob..OFF THEN ON

The action on the ECAM LOWER DISPLAY brightness knob produces the same effect.

EIS DISPLAY DISCREPANCY

Applicable to: ALL

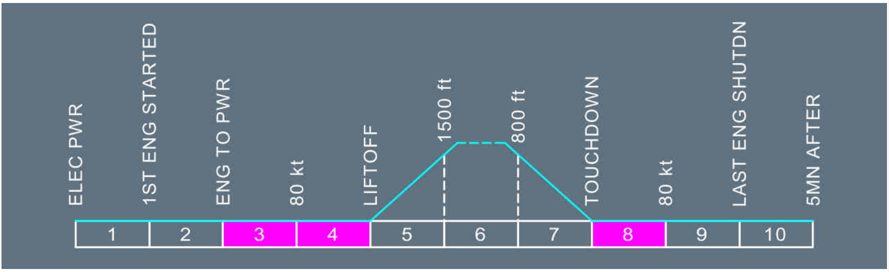
Ident.: PRO-ABN-EIS-L-00017507.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a discrepancy is detected on EWD, SD, PFD or ND.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Continued on the following page

EIS DISPLAY DISCREPANCY (Cont'd)

Ident.: PRO-ABN-EIS-L-00010028.0001001 / 05 MAR 19

CHECK EWD
CHECK SD
CHECK PFD
CHECK ND

L2 *The DMC detects a discrepancy between acquisition and display on a DU.*
This alert is associated with an amber message displayed on the affected DU. In case of EWD display discrepancy, the amber message is displayed on the EWD and on both NDs.

L1 DMC/DU sw .... AS RQRD

L2 *Note: The failure may be due to a DMC or a DU problem.*

L1 ■ **If CHECK EWD or CHECK SD:**
ECAM SWITCHING DMC .... 1 OR 2
L2 *DMC 1 or 2 may be selected if not failed.*
L1 ● **If unsuccessful:**
ECAM SWITCHING DMC .... AUTO
■ **If CHECK EWD:**
ECAM UPPER DISPLAY .... OFF
L2 *EWD is automatically transferred on SD.*
L1 ECAM SWITCHING ECAM/ND .... CAPT OR F/O
L2 *SD may be recovered on CAPT or on F/O ND.*

L1 ■ **If CHECK SD:**
ECAM SWITCHING ECAM/ND .... AS RQRD
ECAM LOWER DISPLAY .... AS RQRD
L2 *The DU may be switched off.*

L1 ■ **If CHECK PFD or CHECK ND:**
CROSSCHECK WITH STBY INSTRUMENTS
EFIS DMC (affected side) 3
● **If unsuccessful:**
EFIS DMC (affected side) .... NORM
PFD/ND XFR (affected side) .... AS RQRD
DU (affected) .... AS RQRD

Continued on the following page

EIS DISPLAY DISCREPANCY (Cont'd)

L2 *The DU can be switched off.*

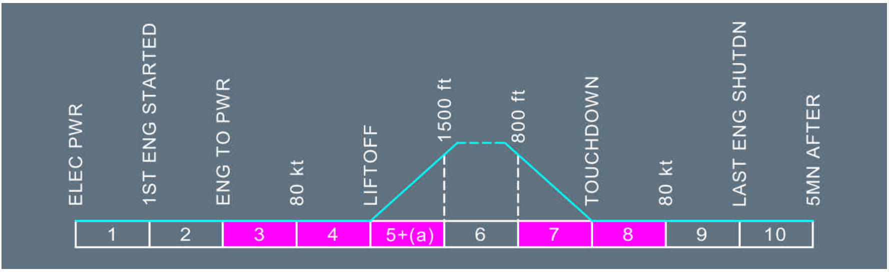
EIS DMC 3 FAULT

Applicable to: ALL

Ident.: PRO-ABN-EIS-I-00017509.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5+(a)
6
7
8
9
10

Note: *(a) Inhibited only during the first 15 s of Phase 5.*

Ident.: PRO-ABN-EIS-I-00010024.0002001 / 10 AUG 10

ECAM SWTG DMC (IF DMC 1 OPERATIVE)..........1

- **If DMC 1(2) failed:**

  ECAM SWTG DMC..........2 (1)

  CAPT (F/O) EFIS DMC..........2 (1)

Ident.: PRO-ABN-EIS-I-00010025.0002001 / 10 AUG 10

STATUS

	INOP SYS
	DMC 3

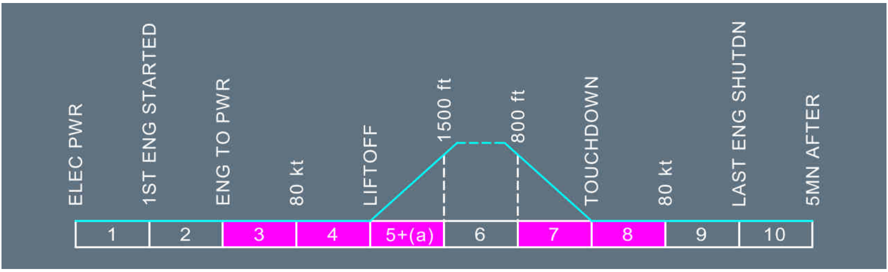
EIS DMC 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-EIS-G-00017510.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5+(a)
6
7
8
9
10

L2 *Note:* *(a) Inhibited only during the first 15 s of phase 5.*

Ident.: PRO-ABN-EIS-G-00010020.0003001 / 10 AUG 10

CAPT (F/O) EFIS DMC (IF EFIS DMC3 AVAIL).. 3
CAPT (F/O) EFIS DMC (IF EFIS DMC2 OR 1 AVAIL)... 2(1)

Ident.: PRO-ABN-EIS-G-00010021.0002001 / 10 AUG 10

STATUS

INOP SYS

DMC 1(2)

Intentionally left blank

[QRH] C/B TRIPPED

Ident.: PRO-ABN-ELEC-00012103.0001001 / 20 MAR 17
Applicable to: ALL

- **On ground:**
  Do not reengage the circuit breaker (C/B) of the fuel pump(s) of any tank. For all other C/B, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause is identified
- **In flight:**
  Do not reengage a circuit breaker (C/B), unless the captain judges it necessary to do so for the safe continuation of the flight. Only one reengagement should be attempted.

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: LV-GKO, LV-GKP

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)

Ident.: PRO-ABN-ELEC-AA-00012429.0001001 / 17 MAR 17

AIR COND PRESS VENT	PRESS AUTO SYS 1	Norm	Norm	Norm	Norm
	MAN PRESS CTL	inop	inop	inop	Norm
	RAM AIR	Norm	Norm	Norm	Norm
	PACK VALVE	Norm	Norm	Norm	Norm
	AVIONIC VENT	OVBD only	OVBD only	OVBD only	OVBD only
	CARGO VENT	ISOL valve only	inop	inop	inop

Ident.: PRO-ABN-ELEC-AA-00012430.0001001 / 17 MAR 17

AUTO FLT	FMGC	1 only	inop	inop	inop
	MCDU	1 only	inop	inop	3 only
	FCU	1 only	1 only	1 only	1 only

Ident.: PRO-ABN-ELEC-AA-00012431.0001001 / 17 MAR 17

COM	VHF 1	Norm	Norm	Norm	Norm
	HF 1	Norm [(a)]	inop	inop	inop
	RMP 1	Norm	Norm	Norm	Norm
	ACP (CAPT., F/O)	Norm	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm	Norm
	CVR	Norm	inop	inop	inop
	LOUDSPEAKER 1+2	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00018591.0001001 / 17 MAR 17

FIRE	ENG LOOPS	A only	A only	A only	A only
	APU LOOP	A only	A only	A only	Norm
	CARGO SMOKE DET	1 only	INOP	INOP	INOP
	ENG FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	APU FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	CARGO FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	APU AUTO EXT.				Norm

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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)
Ident.: PRO-ABN-ELEC-AA-00018592.0001001 / 04 NOV 20					
FLT CTL	PRIM 1	Norm	Norm	Norm	Norm
	SEC 2	Norm	Norm	Norm	Norm
	SEC 1	Norm	Norm	Norm	Norm
	FCDC 1	Norm	Norm	inop	inop
	SFCC SLATS	1 only (b)	1 only (b)	1 only	1 only
	SFCC FLAPS	1 only (b)	inop	inop	inop
	PITCH TRIM	1 only	inop	inop	inop
	RUDD TRIM	Norm	inop	inop	inop
	RUDD TRAVEL	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00018596.0001001 / 17 MAR 17					
FUEL	FCMC	1 only	Inop	Inop	2 only
	PUMPS	L PUMP 2 only (c)	L PUMP 2 only (c)	Inop	Inop
	X FEED	Mot 1 only	Mot 1 only	Mot 1 only	Mot 1 only
	LP VALVES	Mot 1 only	Mot 1 only	Mot 1 only	Mot 1 only
	XFR, ISOL VALVES	Norm	Norm	Norm	Norm
	AFT APU PUMPS	Norm (a)	Norm (a)	Norm (a)	Norm (a)
	APU LP VALVE	Norm	Norm	Norm	Norm
	JETTISON ◁	Inop	Inop	Inop	Inop
Ident.: PRO-ABN-ELEC-AA-00012436.0001001 / 17 MAR 17					
HYD	FIRE SOV	Norm	Norm	Norm	Norm
	RAT CTL	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00012437.0001001 / 17 MAR 17					
ICE & RAIN	WING A.ICE	Norm	Inop	Inop	Inop
	ENG A.ICE	Open	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm	Norm
	WHC 1	Norm (b)	Inop	Inop	Inop
	CAPT AOA	Norm	Inop	Inop	Inop
	STBY AOA/PITOT	Norm (d)	Inop	Inop	Inop
	RAIN REPEL ◁	CAPT	CAPT	CAPT	CAPT

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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)

Ident.: PRO-ABN-ELEC-AA-00012438.0001001 / 17 MAR 17

EIS	PFD 1	Norm	Norm	Norm	Norm
	ND 1	Norm	INOP	INOP	INOP
	ECAM upper DU	Norm	Norm	Norm	Norm
	DMC 1 or 3	Norm	Norm	Norm	Norm
	SDAC 1, FWC 1	Norm	Norm	Norm	Norm
	ECP	Norm	Norm	Norm	Norm
	CLOCK	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012439.0001001 / 17 MAR 17

L/G	LGCIU	1 only (b)	1 only (b)	1 only	1 only
	GRVTY EXT	Norm	Norm	Norm	Norm
	IND. PANEL	Norm	Norm	Norm	Norm
	AUTO BRK/ANTI SKID	Inop / Norm (b)	inop	inop	inop
	PARK BRK	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012441.0001001 / 17 MAR 17

LIGHTS	L LDG LT	Norm (b)	Inop	Inop	Inop

Ident.: PRO-ABN-ELEC-AA-00018597.0002001 / 10 MAY 22

NAV	IR 1 and 3	Norm	Norm	Norm	Norm
	IR 2	5 min	5 min	5 min	5 min
	ADR 1	Norm	Norm	Norm	Norm
	ADR 3	Norm (d)	Inop	Inop	Inop
	VOR or ADF ◁* (f)	1 only	1 only	1 only	1 only
	DME	1 only	Inop	Inop	Inop
	ILS or MMR ◁*	1 only (e)	1 only (e)	1 only (e)	1 only (e)
	DDRMI ◁*	Norm	Norm	Norm	Norm
	ATC	1 only	Inop	Inop	Inop
	RADAR	1 only	Inop	Inop	Inop
ISIS	Norm	Norm	Norm	Norm	

Ident.: PRO-ABN-ELEC-AA-00012443.0001001 / 17 MAR 17

OXYGEN	Crew OXY valve CTL	Norm	Inop	Inop	Inop
	PAX OXY	Norm	Norm	Norm	Norm

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ELEC EMER CONFIG SYS REMAINING		**EMER GEN RUNNING**		**BAT ONLY**	
		SUPPLIED BY ENG HYD PUMPS	**SUPPLIED BY RAT ONLY**	**IN FLT**	**ON GND (IAS < 50 kt)**

Ident.: PRO-ABN-ELEC-AA-00012444.0001001 / 17 MAR 17

PNEU	ENG BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop	BMC 2 inop
	X BLEED	man only	man only	man only	man only

Ident.: PRO-ABN-ELEC-AA-00012445.0001001 / 17 MAR 17

APU		Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012446.0001001 / 17 MAR 17

DOORS	SLIDES ARM/WARN	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012447.0001001 / 17 MAR 17

PWR PLT	FADECs	A only	A only	A only	A only
	IGNITION	A only	A only	A only	A only
	REV	Inop	Inop	Inop	Inop
	HP VALVE closure	Norm	Norm	Norm	Norm

(a) *Shed when the LAND RECOVERY pb-sw is ON.*

(b) *Operative, when the LAND RECOVERY pb-sw is ON.*

(c)
- *The crossfeed valve automatically opens.*
- *If the L PUMP 2 is inoperative, R PUMP 2 takes over.*
- *The remaining pump is lost, when LAND RECOVERY pb-sw is ON.*
  When supplied by RAT only, the remaining pump is lost when speed is below 260 kt.

(d) *Shed when the LAND RECOVERY pb-sw is ON, unless the AIR DATA selector is switched to “CAPT ON 3”. (This leads to loss of the autopilot).*

(e) *ILS is operative when the LAND RECOVERY pb-sw is ON.*

(f) *Only VOR 1 or ADF 1 ◁ (as selected on the DDRMI ◁) is available at a time.*
If the DDRMI is deactivated, only VOR 1 is available on the ND (ADF 1 will not be available independently of the selection performed on the DDRMI).

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)
Ident.: PRO-ABN-ELEC-AA-00012429.0001001 / 17 MAR 17					
AIR COND PRESS VENT	PRESS AUTO SYS 1	Norm	Norm	Norm	Norm
	MAN PRESS CTL	inop	inop	inop	Norm
	RAM AIR	Norm	Norm	Norm	Norm
	PACK VALVE	Norm	Norm	Norm	Norm
	AVIONIC VENT	OVBD only	OVBD only	OVBD only	OVBD only
	CARGO VENT	ISOL valve only	inop	inop	inop
Ident.: PRO-ABN-ELEC-AA-00012430.0001001 / 17 MAR 17					
AUTO FLT	FMGC	1 only	inop	inop	inop
	MCDU	1 only	inop	inop	3 only
	FCU	1 only	1 only	1 only	1 only
Ident.: PRO-ABN-ELEC-AA-00012431.0001001 / 17 MAR 17					
COM	VHF 1	Norm	Norm	Norm	Norm
	HF 1	Norm (a)	inop	inop	inop
	RMP 1	Norm	Norm	Norm	Norm
	ACP (CAPT., F/O)	Norm	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm	Norm
	CVR	Norm	inop	inop	inop
	LOUDSPEAKER 1+2	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00018591.0001001 / 17 MAR 17					
FIRE	ENG LOOPS	A only	A only	A only	A only
	APU LOOP	A only	A only	A only	Norm
	CARGO SMOKE DET	1 only	INOP	INOP	INOP
	ENG FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	APU FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	CARGO FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	APU AUTO EXT.				Norm

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Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	**SUPPLIED BY RAT ONLY**	**IN FLT**	**ON GND (IAS < 50 kt)**

Ident.: PRO-ABN-ELEC-AA-00018592.0001001 / 04 NOV 20

FLT CTL	PRIM 1	Norm	Norm	Norm	Norm
	SEC 2	Norm	Norm	Norm	Norm
	SEC 1	Norm	Norm	Norm	Norm
	FCDC 1	Norm	Norm	inop	inop
	SFCC SLATS	1 only (b)	1 only (b)	1 only	1 only
	SFCC FLAPS	1 only (b)	inop	inop	inop
	PITCH TRIM	1 only	inop	inop	inop
	RUDD TRIM	Norm	inop	inop	inop
	RUDD TRAVEL	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00018596.0001001 / 17 MAR 17

FUEL	FCMC	1 only	Inop	Inop	2 only
	PUMPS	L PUMP 2 only (c)	L PUMP 2 only (c)	Inop	Inop
	X FEED	Mot 1 only	Mot 1 only	Mot 1 only	Mot 1 only
	LP VALVES	Mot 1 only	Mot 1 only	Mot 1 only	Mot 1 only
	XFR, ISOL VALVES	Norm	Norm	Norm	Norm
	AFT APU PUMPS	Norm (a)	Norm (a)	Norm (a)	Norm (a)
	APU LP VALVE	Norm	Norm	Norm	Norm
	JETTISON ◁	Inop	Inop	Inop	Inop

Ident.: PRO-ABN-ELEC-AA-00012436.0001001 / 17 MAR 17

HYD	FIRE SOV	Norm	Norm	Norm	Norm
	RAT CTL	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012437.0001001 / 17 MAR 17

ICE & RAIN	WING A.ICE	Norm	Inop	Inop	Inop
	ENG A.ICE	Open	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm	Norm
	WHC 1	Norm (b)	Inop	Inop	Inop
	CAPT AOA	Norm	Inop	Inop	Inop
	STBY AOA/PITOT	Norm (d)	Inop	Inop	Inop
	RAIN REPEL ◁	CAPT	CAPT	CAPT	CAPT

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ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)

Ident.: PRO-ABN-ELEC-AA-00012438.0001001 / 17 MAR 17

EIS	PFD 1	Norm	Norm	Norm	Norm
	ND 1	Norm	INOP	INOP	INOP
	ECAM upper DU	Norm	Norm	Norm	Norm
	DMC 1 or 3	Norm	Norm	Norm	Norm
	SDAC 1, FWC 1	Norm	Norm	Norm	Norm
	ECP	Norm	Norm	Norm	Norm
	CLOCK	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012439.0001001 / 17 MAR 17

L/G	LGCIU	1 only (b)	1 only (b)	1 only	1 only
	GRVTY EXT	Norm	Norm	Norm	Norm
	IND. PANEL	Norm	Norm	Norm	Norm
	AUTO BRK/ANTI SKID	Inop / Norm (b)	inop	inop	inop
	PARK BRK	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012441.0001001 / 17 MAR 17

LIGHTS	L LDG LT	Norm (b)	Inop	Inop	Inop

Ident.: PRO-ABN-ELEC-AA-00018597.0004001 / 21 MAR 17

NAV	IR 1 and 3	Norm	Norm	Norm	Norm
	IR 2	5 min	5 min	5 min	5 min
	ADR 1	Norm	Norm	Norm	Norm
	ADR 3	Norm (d)	Inop	Inop	Inop
	VOR or ADF ◁✳ (f)	1 only	1 only	1 only	1 only
	DME	1 only	1 only	1 only	1 only
	ILS or MMR ◁✳	1 only (e)	1 only (e)	1 only (e)	1 only (e)
	DDRMI ◁✳	Norm	Norm	Norm	Norm
	ATC	1 only	Inop	Inop	Inop
	RADAR	1 only	Inop	Inop	Inop
	ISIS	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012443.0001001 / 17 MAR 17

OXYGEN	Crew OXY valve CTL	Norm	Inop	Inop	Inop
	PAX OXY	Norm	Norm	Norm	Norm

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ELEC EMER CONFIG SYS REMAINING		**EMER GEN RUNNING**		**BAT ONLY**	
		SUPPLIED BY ENG HYD PUMPS	**SUPPLIED BY RAT ONLY**	**IN FLT**	**ON GND (IAS < 50 kt)**

Ident.: PRO-ABN-ELEC-AA-00012444.0001001 / 17 MAR 17

PNEU	ENG BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop	BMC 2 inop
	X BLEED	man only	man only	man only	man only

Ident.: PRO-ABN-ELEC-AA-00012445.0001001 / 17 MAR 17

APU		Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012446.0001001 / 17 MAR 17

DOORS	SLIDES ARM/WARN	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012447.0001001 / 17 MAR 17

PWR PLT	FADECs	A only	A only	A only	A only
	IGNITION	A only	A only	A only	A only
	REV	Inop	Inop	Inop	Inop
	HP VALVE closure	Norm	Norm	Norm	Norm

(a) *Shed when the LAND RECOVERY pb-sw is ON.*

(b) *Operative, when the LAND RECOVERY pb-sw is ON.*

(c)
- *The crossfeed valve automatically opens.*
- *If the L PUMP 2 is inoperative, R PUMP 2 takes over.*
- *The remaining pump is lost, when LAND RECOVERY pb-sw is ON.*
  When supplied by RAT only, the remaining pump is lost when speed is below 260 kt.

(d) *Shed when the LAND RECOVERY pb-sw is ON, unless the AIR DATA selector is switched to "CAPT ON 3". (This leads to loss of the autopilot).*

(e) *ILS is operative when the LAND RECOVERY pb-sw is ON.*

(f) *Only VOR 1 or ADF 1 ◁ ADF 1 ◁ (as selected on the DDRMI ◁) is available at a time. If the DDRMI is deactivated, only VOR 1 is available on the ND (ADF 1 will not be available independently of the selection performed on the DDRMI).*

[QRH] ELEC EMER CONFIG SYS REMAINING

Applicable to: LV-KHT, LV-KHU

ELEC EMER CONFIG SYS REMAINING	EMER GEN RUNNING		BAT ONLY	
	SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)

Ident.: PRO-ABN-ELEC-AA-00012429.0001001 / 17 MAR 17

AIR COND PRESS VENT	PRESS AUTO SYS 1	Norm	Norm	Norm	Norm
	MAN PRESS CTL	inop	inop	inop	Norm
	RAM AIR	Norm	Norm	Norm	Norm
	PACK VALVE	Norm	Norm	Norm	Norm
	AVIONIC VENT	OVBD only	OVBD only	OVBD only	OVBD only
	CARGO VENT	ISOL valve only	inop	inop	inop

Ident.: PRO-ABN-ELEC-AA-00012430.0001001 / 17 MAR 17

AUTO FLT	FMGC	1 only	inop	inop	inop
	MCDU	1 only	inop	inop	3 only
	FCU	1 only	1 only	1 only	1 only

Ident.: PRO-ABN-ELEC-AA-00012431.0001001 / 17 MAR 17

COM	VHF 1	Norm	Norm	Norm	Norm
	HF 1	Norm (a)	inop	inop	inop
	RMP 1	Norm	Norm	Norm	Norm
	ACP (CAPT., F/O)	Norm	Norm	Norm	Norm
	CIDS	Norm	Norm	Norm	Norm
	INTERPHONE	Norm	Norm	Norm	Norm
	CVR	Norm	inop	inop	inop
	LOUDSPEAKER 1+2	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00018591.0001001 / 17 MAR 17

FIRE	ENG LOOPS	A only	A only	A only	A only
	APU LOOP	A only	A only	A only	Norm
	CARGO SMOKE DET	1 only	INOP	INOP	INOP
	ENG FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	APU FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	CARGO FIRE EXT.	Squib A	Squib A	Squib A	Squib A
	APU AUTO EXT.				Norm

Continued on the following page

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		**EMER GEN RUNNING**		**BAT ONLY**	
		SUPPLIED BY ENG HYD PUMPS	**SUPPLIED BY RAT ONLY**	**IN FLT**	**ON GND (IAS < 50 kt)**
Ident.: PRO-ABN-ELEC-AA-00018592.0001001 / 04 NOV 20					
FLT CTL	PRIM 1	Norm	Norm	Norm	Norm
	SEC 2	Norm	Norm	Norm	Norm
	SEC 1	Norm	Norm	Norm	Norm
	FCDC 1	Norm	Norm	inop	inop
	SFCC SLATS	1 only (b)	1 only (b)	1 only	1 only
	SFCC FLAPS	1 only (b)	inop	inop	inop
	PITCH TRIM	1 only	inop	inop	inop
	RUDD TRIM	Norm	inop	inop	inop
	RUDD TRAVEL	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00018596.0001001 / 17 MAR 17					
FUEL	FCMC	1 only	Inop	Inop	2 only
	PUMPS	L PUMP 2 only (c)	L PUMP 2 only (c)	Inop	Inop
	X FEED	Mot 1 only	Mot 1 only	Mot 1 only	Mot 1 only
	LP VALVES	Mot 1 only	Mot 1 only	Mot 1 only	Mot 1 only
	XFR, ISOL VALVES	Norm	Norm	Norm	Norm
	AFT APU PUMPS	Norm (a)	Norm (a)	Norm (a)	Norm (a)
	APU LP VALVE	Norm	Norm	Norm	Norm
	JETTISON	Inop	Inop	Inop	Inop
Ident.: PRO-ABN-ELEC-AA-00012436.0001001 / 17 MAR 17					
HYD	FIRE SOV	Norm	Norm	Norm	Norm
	RAT CTL	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00012437.0001001 / 17 MAR 17					
ICE & RAIN	WING A.ICE	Norm	Inop	Inop	Inop
	ENG A.ICE	Open	Open	Open	Open
	CAPT PITOT	Norm	Norm	Norm	Norm
	WHC 1	Norm (b)	Inop	Inop	Inop
	CAPT AOA	Norm	Inop	Inop	Inop
	STBY AOA/PITOT	Norm (d)	Inop	Inop	Inop
	RAIN REPEL	CAPT	CAPT	CAPT	CAPT

Continued on the following page

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		**EMER GEN RUNNING**		**BAT ONLY**	
		SUPPLIED BY ENG HYD PUMPS	**SUPPLIED BY RAT ONLY**	**IN FLT**	**ON GND (IAS < 50 kt)**
Ident.: PRO-ABN-ELEC-AA-00012438.0001001 / 17 MAR 17					
EIS	PFD 1	Norm	Norm	Norm	Norm
	ND 1	Norm	INOP	INOP	INOP
	ECAM upper DU	Norm	Norm	Norm	Norm
	DMC 1 or 3	Norm	Norm	Norm	Norm
	SDAC 1, FWC 1	Norm	Norm	Norm	Norm
	ECP	Norm	Norm	Norm	Norm
	CLOCK	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00012439.0001001 / 17 MAR 17					
L/G	LGCIU	1 only *(b)*	1 only *(b)*	1 only	1 only
	GRVTY EXT	Norm	Norm	Norm	Norm
	IND. PANEL	Norm	Norm	Norm	Norm
	AUTO BRK/ANTI SKID	Inop / Norm *(b)*	inop	inop	inop
	PARK BRK	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00012441.0001001 / 17 MAR 17					
LIGHTS	L LDG LT	Norm *(b)*	Inop	Inop	Inop
Ident.: PRO-ABN-ELEC-AA-00018597.0004001 / 21 MAR 17					
NAV	IR 1 and 3	Norm	Norm	Norm	Norm
	IR 2	5 min	5 min	5 min	5 min
	ADR 1	Norm	Norm	Norm	Norm
	ADR 3	Norm *(d)*	Inop	Inop	Inop
	VOR or ADF ⊲✻ *(f)*	1 only	1 only	1 only	1 only
	DME	1 only	1 only	1 only	1 only
	ILS or MMR ⊲✻	1 only *(e)*	1 only *(e)*	1 only *(e)*	1 only *(e)*
	DDRMI ⊲✻	Norm	Norm	Norm	Norm
	ATC	1 only	Inop	Inop	Inop
	RADAR	1 only	Inop	Inop	Inop
	ISIS	Norm	Norm	Norm	Norm
Ident.: PRO-ABN-ELEC-AA-00012443.0001001 / 17 MAR 17					
OXYGEN	Crew OXY valve CTL	Norm	Inop	Inop	Inop
	PAX OXY	Norm	Norm	Norm	Norm

Continued on the following page

Continued from the previous page

ELEC EMER CONFIG SYS REMAINING		EMER GEN RUNNING		BAT ONLY	
		SUPPLIED BY ENG HYD PUMPS	SUPPLIED BY RAT ONLY	IN FLT	ON GND (IAS < 50 kt)

Ident.: PRO-ABN-ELEC-AA-00012444.0001001 / 17 MAR 17

PNEU	ENG BLEED	BMC 2 inop	BMC 2 inop	BMC 2 inop	BMC 2 inop
	X BLEED	man only	man only	man only	man only

Ident.: PRO-ABN-ELEC-AA-00012445.0001001 / 17 MAR 17

APU		Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012446.0001001 / 17 MAR 17

DOORS	SLIDES ARM/WARN	Norm	Norm	Norm	Norm

Ident.: PRO-ABN-ELEC-AA-00012447.0003001 / 17 MAR 17

PWR PLT	FADEC's	A+B	A+B	A+B	A+B
	IGNITION	A only	A only	A only	A only
	REV	Inop	Inop	Inop	Inop
	HP VALVE closure	Norm	Norm	Norm	Norm

(a) *Shed when the LAND RECOVERY pb-sw is ON.*

(b) *Operative, when the LAND RECOVERY pb-sw is ON.*

(c)
- *The crossfeed valve automatically opens.*
- *If the L PUMP 2 is inoperative, R PUMP 2 takes over.*
- *The remaining pump is lost, when LAND RECOVERY pb-sw is ON.*
  When supplied by RAT only, the remaining pump is lost when speed is below 260 kt.

(d) *Shed when the LAND RECOVERY pb-sw is ON, unless the AIR DATA selector is switched to "CAPT ON 3". (This leads to loss of the autopilot).*

(e) *ILS is operative when the LAND RECOVERY pb-sw is ON.*

(f) *Only VOR 1 or ADF 1 ◁ ADF 1 ◁ (as selected on the DDRMI ◁) is available at a time. If the DDRMI is deactivated, only VOR 1 is available on the ND (ADF 1 will not be available independently of the selection performed on the DDRMI).*

ELEC AC BUS 1 FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

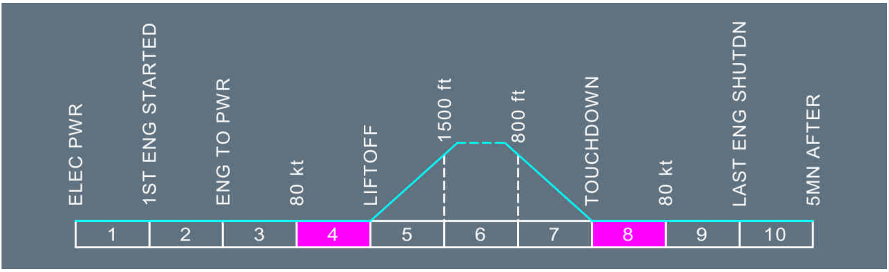
Ident.: PRO-ABN-ELEC-T-00017341.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018416.0010001 / 21 MAR 16

L2 If the automatic transfer of AC ESS BUS is inoperative, the ECAM's E/WD and SD DUs are simultaneously lost.
The ECAM/ND SEL must be used to recover the E/WD on the NDU, in order to apply the ECAM procedure.

L1 AC ESS FEED.. ALTN

L2 *This line is displayed, if automatic AC ESS transfer has failed.*

L1 EMER ELEC PWR..MAN ON

L2 *This line is displayed, if manual AC ESS transfer has failed.*

L1 VENT EXTRACT..OVRD

L2 *Air is blown through the overboard valve which is partially open.*

L1 PACK FLOW..HI

L2 *For A330-200F aircraft, this line is displayed, if R CAB VENT has failed.*

L1
- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE
  DO NOT EXCEED N1 LIMIT
  ENG 1 AND 2 N1 MODE..ON
  MAN THR..ADJUST
- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS (ONLY IN PHASE 1, 2, 9 OR 10)..OFF
  PAX SYS AVAIL IN FLT

L2 *Displayed if no smoke is detected in VCC.*

L1
- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER

ATC COM VOICE ONLY

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018419.0044001 / 09 FEB 21

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER

LDG DIST PROC.. APPLY

- **For A330-200/300 aircraft, only on ground:**
  CAB TEMP REGUL DEGRADED
- **For A330-200F aircraft, only on ground:**
  MD TEMP REGUL DEGRADED
- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE

CAT 2 ONLY

- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS AVAIL IN FLT

INOP SYS

See below

INOP SYS

EFIS DMC 3
STBY AOA
VENT EXTRACT
AFT CRG VENT
Y ELEC PUMP
PART GALLEY
GPWS
LAV + GAL VENT
RA 1
DATA COMPANY ◁

ECAM DMC 1
STBY PITOT (1)
ADR 3
TR 1
L CAB VENT
L FUEL STBY
TCAS ◁
GND COOL ◁
ATSU ◁

REV 1
CAPT TAT
CAT 3
G ELEC PUMP
ACARS 1+2
R FUEL STBY
L WNDW HEAT
ENG 1 IGN B (2)
DATALINK ATC ◁

Other INOP SYS

BRK FAN ◁ (WHEELS 5, 6, 7, 8)
PVI
DATA LOADER

MDDU
ECAM SD
FWD APU PUMP

PRINTER
AEVC
PART CKPT LIGHTS

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

L VACUUM GEN	HUD ⩤	

The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *(If AIR DATA SWTG is set to CAPT ON 3, STBY PITOT is supplied by the AC ESS BUS, CAPT PITOT is no longer supplied.)*

(2) *(For aircraft equipped with GE/PW engines)*

ELEC AC BUS 1 FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO

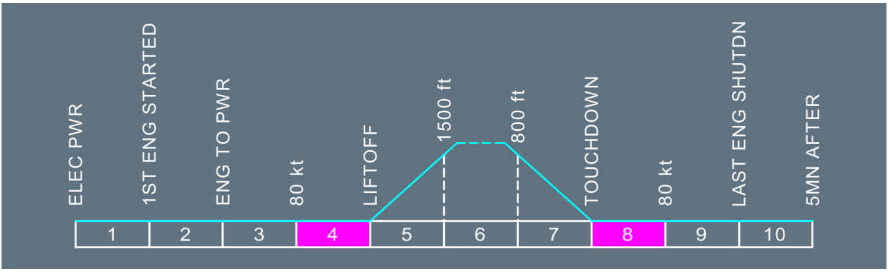
Ident.: PRO-ABN-ELEC-T-00017341.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018416.0010001 / 21 MAR 16

L2 If the automatic transfer of AC ESS BUS is inoperative, the ECAM's E/WD and SD DUs are simultaneously lost.
The ECAM/ND SEL must be used to recover the E/WD on the NDU, in order to apply the ECAM procedure.

L1 AC ESS FEED.. ALTN

L2 *This line is displayed, if automatic AC ESS transfer has failed.*

L1 EMER ELEC PWR..MAN ON

L2 *This line is displayed, if manual AC ESS transfer has failed.*

L1 VENT EXTRACT... OVRD

L2 *Air is blown through the overboard valve which is partially open.*

L1 PACK FLOW.. HI

L2 *For A330-200F aircraft, this line is displayed, if R CAB VENT has failed.*

L1
- **For A330 aircraft equipped with PW/RR engines:**

  ENG 1 N1 DEGRADED MODE

  DO NOT EXCEED N1 LIMIT
  ENG 1 AND 2 N1 MODE..ON
  MAN THR..ADJUST

- **For A330 aircraft equipped with VCC ◁ :**

  PAX SYS (ONLY IN PHASE 1, 2, 9 OR 10)...OFF
  PAX SYS AVAIL IN FLT

L2 *Displayed if no smoke is detected in VCC.*

L1
- **If AC ESS BUS is lost:**

  AVOID ADVERSE WEATHER

ATC COM VOICE ONLY

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018419.0009001 / 21 MAR 16

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER
- **For A330-200/300 aircraft, only on ground :**
  CAB TEMP REGUL DEGRADED
- **For A330-200F aircraft, only on ground :**
  MD TEMP REGUL DEGRADED

CAT 2 ONLY

- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N 1 DEGRADED MODE
- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS AVAIL IN FLT

INOP SYS

See below

INOP SYS

EFIS DMC 3
FUEL AFT XFR
CAPT TAT
CAT 3
G ELEC PUMP
ACARS 1+2
R FUEL STBY
L WNDW HEAT
ENG 1 IGN B (2)

ECAM DMC 1
STBY AOA
VENT EXTRACT
AFT CRG VENT
Y ELEC PUMP
PART GALLEY
GPWS
LAV + GAL VENT
RA 1

REV 1
STBY PITOT (1)
ADR 3
TR 1
L CAB VENT
L FUEL STBY
TCAS ◁
GND COOL ◁

Other INOP SYS

BRK FAN ◁ (WHEELS 5, 6, 7, 8)
PVI
DATA LOADER
L VACUUM GEN

MDDU
ECAM SD
FWD APU PUMP
HUD ◁

PRINTER
AEVC
PART CKPT LIGHTS

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *(If AIR DATA SWTG is set to CAPT ON 3, STBY PITOT is supplied by the AC ESS BUS, CAPT PITOT is no longer supplied.)*
(2) *(For aircraft equipped with GE/PW engines)*

ELEC AC BUS 1 FAULT

Applicable to: LV-KHT

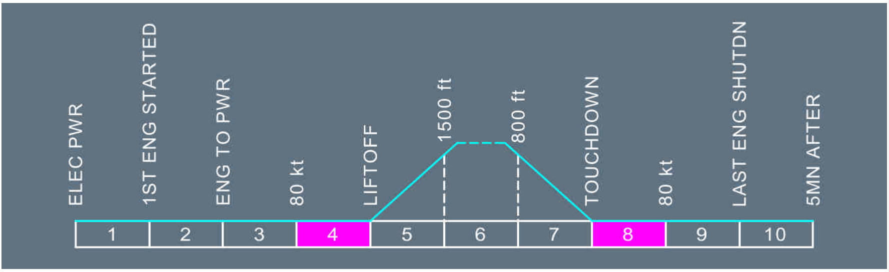
Ident.: PRO-ABN-ELEC-T-00017341.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
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Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018416.0011001 / 21 MAR 16

L2 If the automatic transfer of AC ESS BUS is inoperative, the ECAM's E/WD and SD DUs are simultaneously lost.
The ECAM/ND SEL must be used to recover the E/WD on the NDU, in order to apply the ECAM procedure.

L1 AC ESS FEED..ALTN

L2 *This line is displayed, if automatic AC ESS transfer has failed.*

L1 EMER ELEC PWR..MAN ON

L2 *This line is displayed, if manual AC ESS transfer has failed.*

L1 VENT EXTRACT..OVRD

L2 *Air is blown through the overboard valve which is partially open.*

L1 PACK FLOW..HI

L2 *For A330-200F aircraft, this line is displayed, if R CAB VENT has failed.*

L1
- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE
  DO NOT EXCEED N1 LIMIT
  ENG 1 AND 2 N1 MODE..ON
  - **If A/THR is unavailable:**
    MAN THR..ADJUST
  - **If A/THR is available:**
    A/THR..AS RQRD
- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS (ONLY IN PHASE 1, 2, 9 OR 10)..OFF
  PAX SYS AVAIL IN FLT

L2 *Displayed if no smoke is detected in VCC.*

L1
- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER

ATC COM VOICE ONLY

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018419.0045001 / 09 FEB 21

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER

LDG DIST PROC.. APPLY

- **If A/THR is not available:**
  CAT 2 ONLY
- **If A/THR is available:**
  CAT 1 WITH A/THR
  CAT 2 WITH MAN THR
- **For A330-200/300 aircraft, only on ground:**
  CAB TEMP REGUL DEGRADED
- **For A330-200F aircraft, only on ground:**
  MD TEMP REGUL DEGRADED
- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE
- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS AVAIL IN FLT

INOP SYS

See below

INOP SYS

EFIS DMC 3
STBY AOA
VENT EXTRACT
AFT CRG VENT
Y ELEC PUMP
PART GALLEY
GPWS
LAV + GAL VENT
RA 1
DATALINK ATC ◁

ECAM DMC 1
STBY PITOT (1)
ADR 3
TR 1
L CAB VENT
L FUEL STBY
TCAS ◁
GND COOL ◁
A/THR (3)
DATA COMPANY ◁

REV 1
CAPT TAT
CAT 3
G ELEC PUMP
ACARS 1+2
R FUEL STBY
L WNDW HEAT
ENG 1 IGN B (2)
ATSU ◁

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Other INOP SYS

BRK FAN ✳ (WHEELS 5, 6, 7, 8)
PVI
DATA LOADER
L VACUUM GEN
MDDU
ECAM SD
FWD APU PUMP
HUD ✳
PRINTER
AEVC
PART CKPT LIGHTS

The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *(If AIR DATA SWTG is set to CAPT ON 3, STBY PITOT is supplied by the AC ESS BUS, CAPT PITOT is no longer supplied.)*
(2) *(For aircraft equipped with GE/PW engines)*
(3) *(If A/THR not available)*

ELEC AC BUS 1 FAULT

Applicable to: LV-KHU

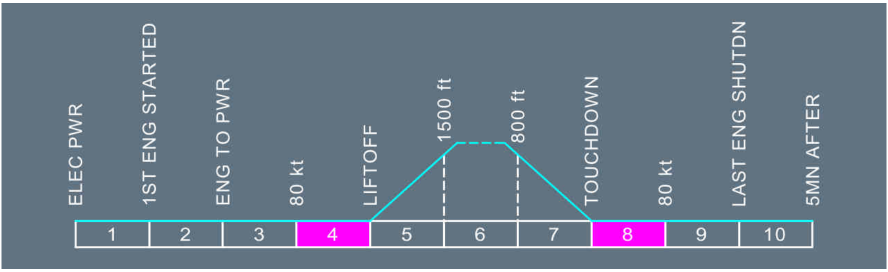
Ident.: PRO-ABN-ELEC-T-00017341.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 1 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018416.0011001 / 21 MAR 16

L2 If the automatic transfer of AC ESS BUS is inoperative, the ECAM's E/WD and SD DUs are simultaneously lost.
The ECAM/ND SEL must be used to recover the E/WD on the NDU, in order to apply the ECAM procedure.

L1 AC ESS FEED.......... ALTN

L2 *This line is displayed, if automatic AC ESS transfer has failed.*

L1 EMER ELEC PWR.......... MAN ON

L2 *This line is displayed, if manual AC ESS transfer has failed.*

L1 VENT EXTRACT.......... OVRD

L2 *Air is blown through the overboard valve which is partially open.*

L1 PACK FLOW.......... HI

L2 *For A330-200F aircraft, this line is displayed, if R CAB VENT has failed.*

L1
- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE
  DO NOT EXCEED N1 LIMIT
  ENG 1 AND 2 N1 MODE.......... ON
  - **If A/THR is unavailable:**
    MAN THR.......... ADJUST
  - **If A/THR is available:**
    A/THR.......... AS RQRD
- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS (ONLY IN PHASE 1, 2, 9 OR 10).......... OFF
  PAX SYS AVAIL IN FLT

L2 *Displayed if no smoke is detected in VCC.*

L1
- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER

ATC COM VOICE ONLY

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-T-00018419.0010001 / 05 MAR 19

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER
- **If A/THR is not available:**
  CAT 2 ONLY
- **If A/THR is available:**
  CAT 1 WITH A/THR
  CAT 2 WITH MAN THR
- **For A330-200/300 aircraft, only on ground:**
  CAB TEMP REGUL DEGRADED
- **For A330-200F aircraft, only on ground:**
  MD TEMP REGUL DEGRADED
- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N 1 DEGRADED MODE
- **For A330 aircraft equipped with VCC ◁ :**
  PAX SYS AVAIL IN FLT

INOP SYS

See below

INOP SYS

EFIS DMC 3
FUEL AFT XFR
CAPT TAT
CAT 3
G ELEC PUMP
ACARS 1+2
R FUEL STBY
L WNDW HEAT
ENG 1 IGN B (2)

ECAM DMC 1
STBY AOA
VENT EXTRACT
AFT CRG VENT
Y ELEC PUMP
PART GALLEY
GPWS
LAV + GAL VENT
RA 1

REV 1
STBY PITOT (1)
ADR 3
TR 1
L CAB VENT
L FUEL STBY
TCAS ◁
GND COOL ◁
A/THR (3)

Other INOP SYS

BRK FAN ◁ (WHEELS 5, 6, 7, 8)
MDDU
PRINTER

Continued on the following page

ELEC AC BUS 1 FAULT (Cont'd)

PVI
DATA LOADER
L VACUUM GEN
ECAM SD
FWD APU PUMP
HUD
AEVC
PART CKPT LIGHTS

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *(If AIR DATA SWTG is set to CAPT ON 3, STBY PITOT is supplied by the AC ESS BUS, CAPT PITOT is no longer supplied.)*
(2) *(For aircraft equipped with GE/PW engines)*
(3) *(If A/THR not available)*

ELEC AC BUS 2 FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

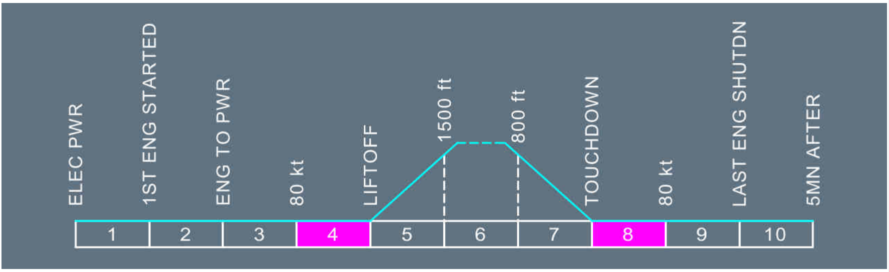
Ident.: PRO-ABN-ELEC-V-00017342.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 2 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
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Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-V-00018420.0007001 / 21 MAR 16

PACK FLOW..HI

L2 *For A330-200F aircraft, this line is displayed, if L CAB VENT has failed.*

L1
- **For A330 aircraft equipped with RR/PW engines:**

  ENG 2 N1 DEGRADED MODE

  DO NOT EXCEED N1 LIMIT

  ENG 1 AND 2 N1 MODE..ON

  MAN THR..ADJUST

ATC/XPDR..SYS 1

- **If AC ESS BUS is lost:**

  AVOID ADVERSE WEATHER

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-V-00018421.0006001 / 21 MAR 16

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER
- **For A330-200/300 aircraft:**
  FWD CRG VENT REDUCED ◁
- **For A330-200F aircraft:**
  FWD VENT REDUCED ◁
- **For A330 aircraft equipped with PW/RR engines**
  ENG 2 N1 DEGRADED MODE

CAT 1 ONLY

INOP SYS

See below

INOP SYS

EFIS DMC 2
FUEL AFT XFR
ADR 2
CAT 2
FWD CRG TEMP ◁ (1)
TR 2
R CAB VENT
R FUEL PUMP 1
R WNDW HEAT
FDIU
SDAC 2

ECAM DMC 2
APU TR
ILS 2
FWD CRG VENT ◁ (1)
LD CRG TEMP ◁ (2)
B ELEC PUMP
PART GALLEY (3)
F T.TK PUMP
DFDR
ENG 2 IGN B (4)
FWC 2

REV 2
HF 2 ◁
LS 2 ◁
LD FWD VENT ◁ (2)
BULK VENT
R WSHLD HEAT
L FUEL PUMP 1
ATC 2 or ATC/XPDR 2
GPS 2
RA 2
GLS AUTOLAND ◁

Other INOP SYS

BRK FAN ◁ (WHEELS 1,2,3,4)
MCDU 2
RADAR 2
R LDG LTS

F/O PFD
AFT CRG LOAD
DME 2
STROBE LT

F/O ND
R VACUUM GEN
ADF 2 ◁
VOR 2

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

PRESSURIZED WATER SYS	PARTIAL CKPT LIGHTS	DRAIN HEAT

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *(For A330-200/300 aircraft)*
(2) *(For A330-200F aircraft)*
(3) *(not applicable to A330-200F)*
(4) *(For A330 aircraft equipped with GE/PW engines)*

ELEC AC BUS 2 FAULT

Applicable to: LV-KHT

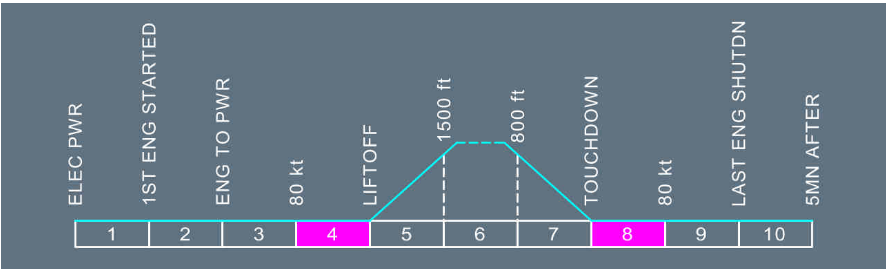
Ident.: PRO-ABN-ELEC-V-00017342.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 2 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-V-00018420.0008001 / 21 MAR 16

PACK FLOW...HI

L2 *For A330-200F aircraft, this line is displayed, if L CAB VENT has failed.*

L1
- **For A330 aircraft equipped with RR/PW engines:**

  ENG 2 N1 DEGRADED MODE

  DO NOT EXCEED N1 LIMIT

  ENG 1 AND 2 N1 MODE.......................................ON

  - **If A/THR is unavailable:**

    MAN THR.......................................ADJUST

  - **If A/THR is available:**

    A/THR.......................................AS RQRD

ATC/XPDR.......................................SYS 1

- **If AC ESS BUS is lost:**

  AVOID ADVERSE WEATHER

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-V-00018421.0011001 / 09 MAY 17

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER
- **For A330-200/300 aircraft:**
  FWD CRG VENT REDUCED ◁✻
- **For A330-200F aircraft:**
  FWD VENT REDUCED ◁✻
- **For A330 aircraft equipped with PW/RR engines**
  ENG 2 N1 DEGRADED MODE

CAT 1 ONLY

INOP SYS

See below

INOP SYS

EFIS DMC 2
FUEL AFT XFR (1)
ADR 2
CAT 2
FWD CRG TEMP ◁✻ (2)
TR 2
R CAB VENT
R FUEL PUMP 1
R WNDW HEAT
FDIU
SDAC 2

ECAM DMC 2
APU TR
ILS 2
FWD CRG VENT ◁✻ (2)
LD CRG TEMP ◁✻ (3)
B ELEC PUMP
PART GALLEY (4)
F T.TK PUMP
DFDR
ENG 2 IGN B (5)
FWC 2

REV 2
HF 2 ◁✻
LS 2 ◁✻
LD FWD VENT ◁✻ (3)
BULK VENT
R WSHLD HEAT
L FUEL PUMP 1
ATC 2 or ATC/XPDR 2
GPS 2
RA 2
GLS AUTOLAND ◁✻

Other INOP SYS

BRK FAN ◁✻ (WHEELS 1,2,3,4)
MCDU 2
RADAR 2
R LDG LTS

F/O PFD
AFT CRG LOAD
DME 2
STROBE LT

F/O ND
R VACUUM GEN
ADF 2 ◁✻
VOR 2

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

PRESSURIZED WATER SYS A/THR	PARTIAL CKPT LIGHTS	DRAIN HEAT

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

(1) *(If center tank empty, or not installed)*
(2) *(For A330-200/300 aircraft)*
(3) *(For A330-200F aircraft)*
(4) *(not applicable to A330-200F)*
(5) *(For A330 aircraft equipped with GE/PW engines)*

ELEC AC BUS 2 FAULT

Applicable to: LV-KHU

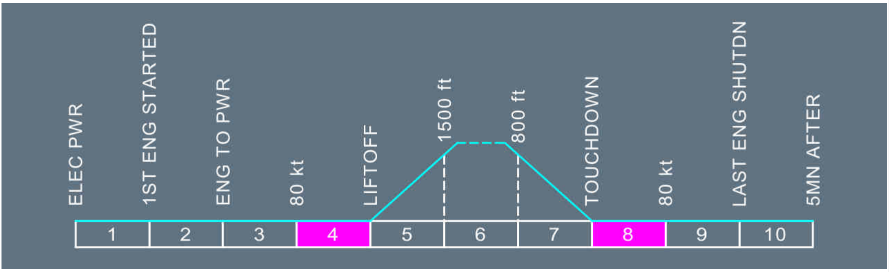
Ident.: PRO-ABN-ELEC-V-00017342.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC 2 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-V-00018420.0008001 / 21 MAR 16

PACK FLOW..HI

L2 *For A330-200F aircraft, this line is displayed, if L CAB VENT has failed.*

L1 ● **For A330 aircraft equipped with RR/PW engines:**

ENG 2 N1 DEGRADED MODE

DO NOT EXCEED N1 LIMIT

ENG 1 AND 2 N1 MODE..ON

■ **If A/THR is unavailable:**

MAN THR..ADJUST

■ **If A/THR is available:**

A/THR..AS RQRD

ATC/XPDR..SYS 1

● **If AC ESS BUS is lost:**

AVOID ADVERSE WEATHER

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-V-00018421.0007001 / 01 JUN 17

L12

STATUS

- **If AC ESS BUS is lost:**
  AVOID ADVERSE WEATHER
- **For A330-200/300 aircraft:**
  FWD CRG VENT REDUCED ◁
- **For A330-200F aircraft:**
  FWD VENT REDUCED ◁
- **For A330 aircraft equipped with PW/RR engines**
  ENG 2 N1 DEGRADED MODE

CAT 1 ONLY

INOP SYS

See below

INOP SYS

EFIS DMC 2
FUEL AFT XFR
ADR 2
CAT 2
FWD CRG TEMP ◁ (1)
TR 2
R CAB VENT
R FUEL PUMP 1
R WNDW HEAT
FDIU
SDAC 2

ECAM DMC 2
APU TR
ILS 2
FWD CRG VENT ◁ (1)
LD CRG TEMP ◁ (2)
B ELEC PUMP
PART GALLEY (3)
F T.TK PUMP
DFDR
ENG 2 IGN B (4)
FWC 2

REV 2
HF 2 ◁
LS 2 ◁
LD FWD VENT ◁ (2)
BULK VENT
R WSHLD HEAT
L FUEL PUMP 1
ATC 2 or ATC/XPDR 2
GPS 2
RA 2
GLS AUTOLAND ◁

Other INOP SYS

BRK FAN ◁ (WHEELS 1,2,3,4)
MCDU 2
RADAR 2
R LDG LTS

F/O PFD
AFT CRG LOAD
DME 2
STROBE LT

F/O ND
R VACUUM GEN
ADF 2 ◁
VOR 2

Continued on the following page

ELEC AC BUS 2 FAULT (Cont'd)

PRESSURIZED WATER SYS
A/THR
PARTIAL CKPT LIGHTS
CMC 2 ◁✱
DRAIN HEAT

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

(1) *(For A330-200/300 aircraft)*
(2) *(For A330-200F aircraft)*
(3) *(not applicable to A330-200F)*
(4) *(For A330 aircraft equipped with GE/PW engines)*

ELEC AC ESS BUS ALTN
(ON GROUND)

Applicable to: ALL

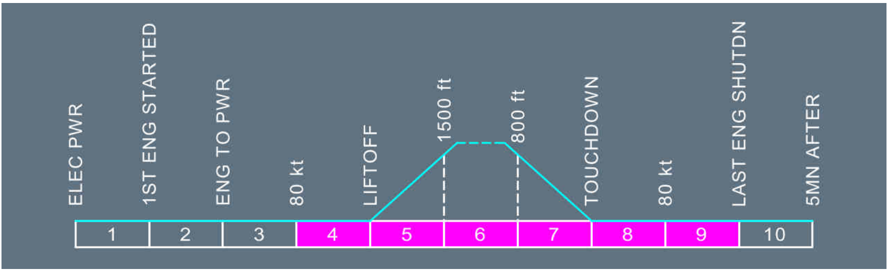
Ident.: PRO-ABN-ELEC-AL-00017363.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC ESS BUS is abnormally supplied by AC 2 BUS.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ELEC-AL-00018432.0001001 / 21 MAR 16

Crew awareness.

ELEC AC ESS BUS FAULT

Applicable to: ALL

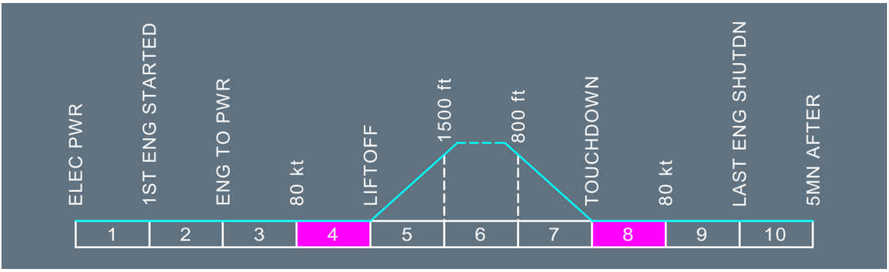
Ident.: PRO-ABN-ELEC-X-00017343.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ELEC-X-00012453.0005001 / 04 AUG 15

AC ESS FEED..ALTN

- **IF UNSUCCESSFUL:**

  CAPT EFIS DMC..3

  L2 *This line is only displayed if AC ESS BUS SHED is available.*

  L1 AIR DATA SWTG..CAPT ON 3

  L2 *This line is only displayed if AC ESS BUS SHED is available.*

L1
- **If AC BUS 1 or AC BUS 2 is lost:**

  AVOID ADVERSE WEATHER

Continued on the following page

ELEC AC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-X-00018435.0005001 / 21 MAR 16

L12

STATUS

- **If AC BUS 1 or AC BUS 2 is lost:**
  AVOID ADVERSE WEATHER

INOP SYS

See below

INOP SYS

EFIS DMC 1
ADR 1
CAT 2
ENG 1, 2 IGN A (1)
GPS 1

ECAM DMC 3
ILS 1
GPWS
SDAC 1
GLS AUTOLAND ◁✳

CAPT PITOT
LS 1 ◁✳
GPWS TERR
FWC 1

Other INOP SYS

AFT APU PUMP
DDRMI ◁✳
CABIN EMER LTS
DME 1

PAX OXY MASKS (auto + manual)
CAPT PFD
CMC 1
ADF ◁✳ 1

L/G IND. PANEL
E/WD
VOR 1

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

(1) *(For aircraft equipped with GE/PW engines)*

ELEC AC ESS BUS SHED

Applicable to: LV-GKO, LV-GKP

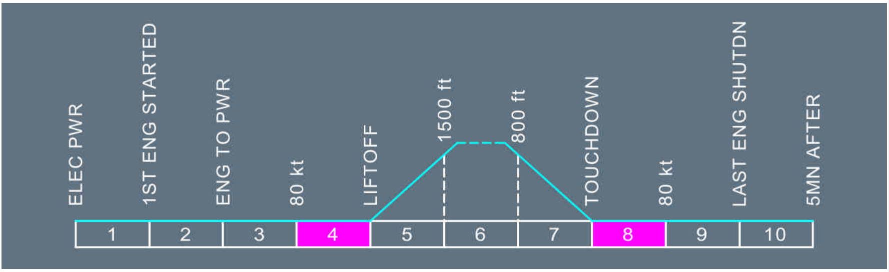
Ident.: PRO-ABN-ELEC-Y-00017344.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC SHED ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ELEC-Y-00018691.0002001 / 21 MAR 16

AIR DATA SWTG.. CAPT ON 3
ATC/XPDR... SYS 2

Continued on the following page

ELEC AC ESS BUS SHED (Cont'd)

Ident.: PRO-ABN-ELEC-Y-00018692.0001001 / 21 MAR 16

L12

STATUS

INOP SYS

CAPT AOA
ATC 1 or ATC/XPDR 1
FUEL AFT XFR
HF 1
L WSHLD HEAT

Other INOP SYS

MCDU 1
CVR
L LDG LTS
CAPT ND
RADAR 1

Note: 1. *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*
2. *AP2 pb light is lost. AP2 engagement can be checked on the FMA.*

ELEC AC ESS BUS SHED

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

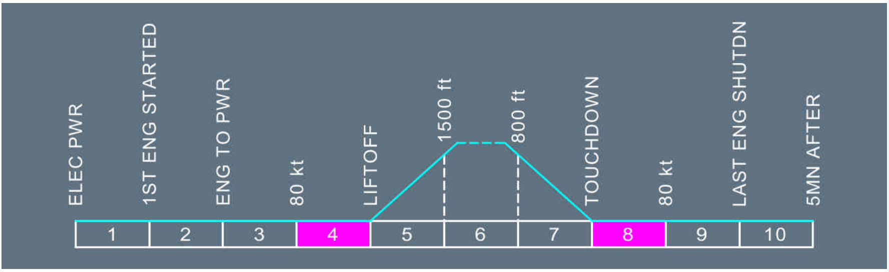
Ident.: PRO-ABN-ELEC-Y-00017344.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC SHED ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
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9
10

Ident.: PRO-ABN-ELEC-Y-00018691.0002001 / 21 MAR 16

AIR DATA SWTG.. CAPT ON 3
ATC/XPDR.. SYS 2

Continued on the following page

ELEC AC ESS BUS SHED (Cont'd)

Ident.: PRO-ABN-ELEC-Y-00018692.0002001 / 21 MAR 16

L12

STATUS

INOP SYS

CAPT AOA
ATC 1 or ATC/XPDR 1
FUEL AFT XFR
HF 1
L WSHLD HEAT

Other INOP SYS

MCDU 1
CVR
L LDG LTS
CAPT ND
DME 1
RADAR 1

Note: 1. *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*
2. *AP2 pb light is lost. AP2 engagement can be checked on the FMA.*

ELEC AC ESS BUS SHED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-KHT

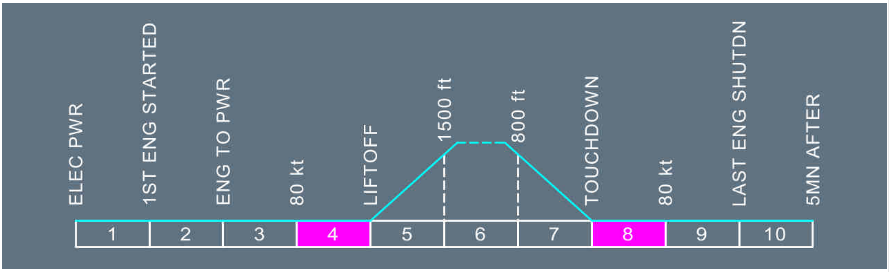
Ident.: PRO-ABN-ELEC-Y-00017344.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AC SHED ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
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8
9
10

Ident.: PRO-ABN-ELEC-Y-00018691.0002001 / 21 MAR 16

AIR DATA SWTG.. CAPT ON 3
ATC/XPDR.. SYS 2

Continued on the following page

ELEC AC ESS BUS SHED (Cont'd)

Ident.: PRO-ABN-ELEC-Y-00018692.0004001 / 09 MAY 17

L12

STATUS

INOP SYS

CAPT AOA
ATC 1 or ATC/XPDR 1
FUEL AFT XFR (1)
HF 1
L WSHLD HEAT

Other INOP SYS

MCDU 1
CVR
L LDG LTS
CAPT ND
DME 1
RADAR 1

Note:
1. *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*
2. *AP2 pb light is lost. AP2 engagement can be checked on the FMA.*

(1) (If center tank empty, or not installed)

ELEC APU BAT SYS FAULT

Applicable to: ALL

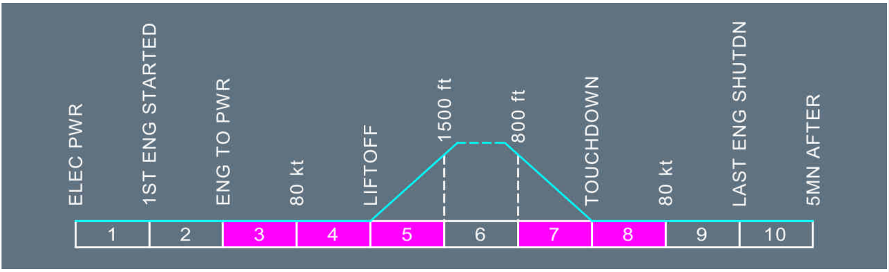
Ident.: PRO-ABN-ELEC-O-00018584.0001001 / 10 APR 18

ANNUNCIATIONS

Triggering Conditions:

L2 The ELEC APU BAT SYS FAULT alert triggers when the BCL of the APU is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ELEC-O-00012406.0001001 / 10 APR 18

Crew awareness.

Ident.: PRO-ABN-ELEC-O-00012407.0001001 / 10 APR 18

STATUS

	INOP SYS
● **If APU BAT SYS FAULT and APU TR fault:** APU START NOT AVAIL	APU BAT SYS

ELEC APU GEN FAULT

Applicable to: ALL

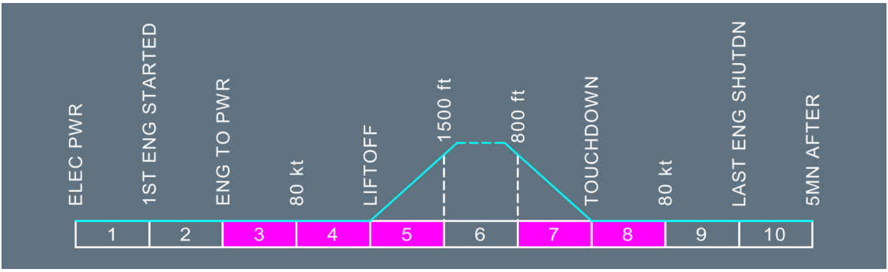
Ident.: PRO-ABN-ELEC-C-00017352.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:
- The protection trip is initiated by the associated GCU, or
- The line contactor is open with APU GEN pb-sw set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-C-00012381.0001001 / 26 OCT 12

APU GEN.. OFF THEN ON

- **IF UNSUCCESSFUL:**

  APU GEN.. OFF

L2 *In flight: restrict use of APU to emergencies.*

Ident.: PRO-ABN-ELEC-C-00012383.0001001 / 18 AUG 10

STATUS

INOP SYS

APU GEN

ELEC BAT 1(2) OR APU BAT FAULT

Applicable to: ALL

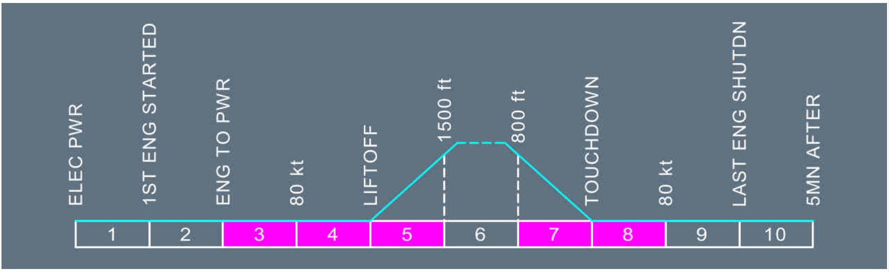
Ident.: PRO-ABN-ELEC-M-00017360.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the charging current increases at an abnormal rate.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-M-00012401.0002001 / 27 FEB 18

- **In case of thermal runaway or short circuit:**

  BAT (AFFECTED)..OFF

  L2 *Battery contactor is automatically opened by Battery Charge Limiter, but the automatic opening must be manually confirmed open.*

L1
- **In case of BAT 2 FAULT:**

  FUEL CONSUMPT INCRSD

  L2 *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

  L1 FMS PRED UNRELIABLE

Continued on the following page

ELEC BAT 1(2) OR APU BAT FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-M-00012402.0002001 / 17 MAR 17

L12

STATUS

- **If APU BAT and APU TR FAULT:**
  APU START NOT AVAIL

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

INOP SYS

BAT 1(2) or APU BAT

L OUTR AIL (1)

(1) *(Depending on the combination of failures)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC BAT 1(2) OR APU BAT OFF

Applicable to: ALL

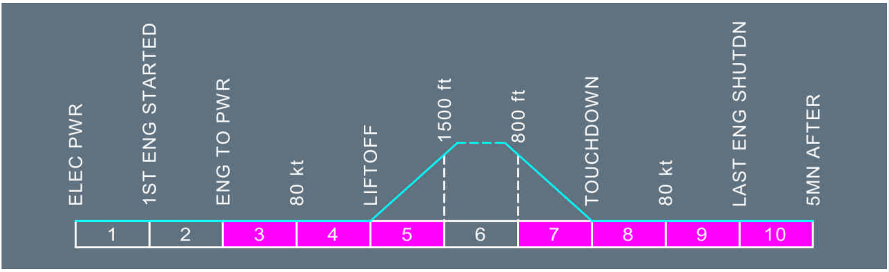
Ident.: PRO-ABN-ELEC-N-00017365.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BAT 1(2) pb-sw is abnormally set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-N-00012403.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ELEC-N-00012404.0001001 / 27 JAN 11

STATUS

- **If APU BAT off and APU TR fault:**
  - **FOR APU START:**
    APU BAT.. ON

ELEC BAT 1(2) SYS FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

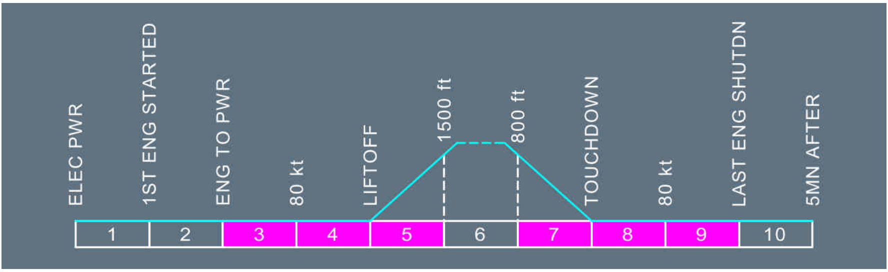
Ident.: PRO-ABN-ELEC-AT-00022091.0002001 / 28 MAY 20

ANNUNCIATIONS

Triggering Conditions:

L2 The ELEC BAT 1(2) SYS FAULT alert triggers when the BCL of BAT 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
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Ident.: PRO-ABN-ELEC-AT-00022092.0002001 / 10 APR 18

BAT 1(2).. OFF THEN ON

L2 *This action line is displayed in cruise (flight phase 6) at the first occurrence of the alert if the BAT SYS failure occurred during the take-off phases (flight phases 3, 4, or 5).*

Ident.: PRO-ABN-ELEC-AT-00022093.0001001 / 10 APR 18

STATUS

INOP SYS

BAT 1(2) SYS

ELEC BAT 1(2) SYS FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

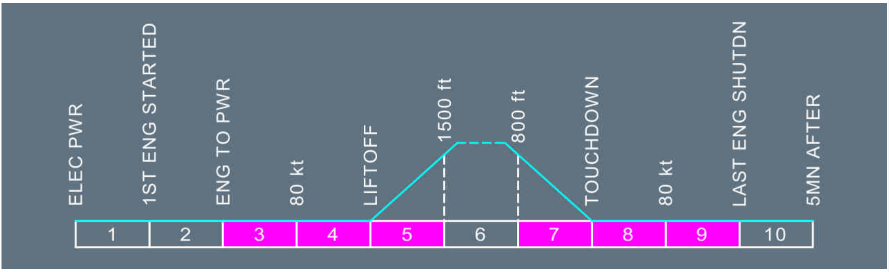
Ident.: PRO-ABN-ELEC-AT-00022091.0002001 / 28 MAY 20

ANNUNCIATIONS

Triggering Conditions:

L2 The ELEC BAT 1(2) SYS FAULT alert triggers when the BCL of BAT 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ELEC-AT-00022092.0001001 / 10 APR 18

Crew awareness.

Ident.: PRO-ABN-ELEC-AT-00022093.0001001 / 10 APR 18

STATUS

INOP SYS

BAT 1(2) SYS

ELEC BUS TIE OFF

Applicable to: ALL

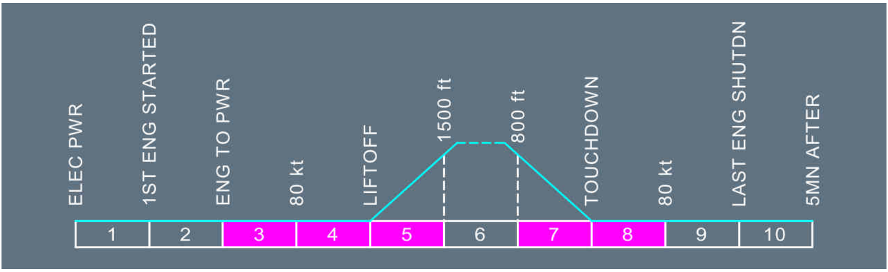
Ident.: PRO-ABN-ELEC-AM-00017362.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BUS TIE pb-sw is set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-AM-00012384.0001001 / 21 MAR 16

Crew awareness.

ELEC C/B MONITOR FAULT

Applicable to: ALL

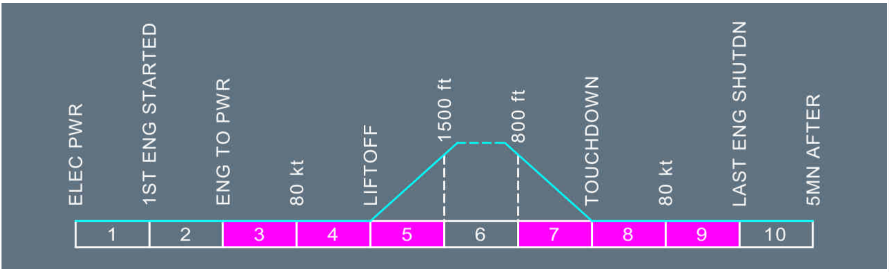
Ident.: PRO-ABN-ELEC-Q-00017372.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the CBMU is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-Q-00012410.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-ELEC-Q-00012411.0001001 / 18 AUG 10

STATUS

INOP SYS

C/B MONITOR

ELEC C/B TRIPPED

Applicable to: ALL

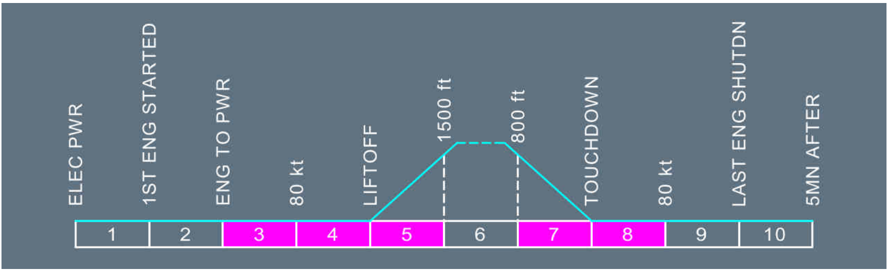
Ident.: PRO-ABN-ELEC-AN-00017359.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one C/B is tripped.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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5
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Ident.: PRO-ABN-ELEC-AN-00012412.0001001 / 25 FEB 14

Crew awareness.

L2 Press the C/B pb on the ECP to identify the affected circuit breakers on the C/B SD page.

Note: *Do not reengage a C/B that has tripped by itself, unless the Captain judges it necessary to do so for the safe continuation of the flight. This procedure should be adopted only as a last resort, and only one reengagement should be attempted. On ground, do not reengage the C/B of the fuel pump(s) of any tank. For all other C/B, if the flight crew coordinates the action with maintenance, the flight crew may reengage a tripped C/B, provided that the cause of the tripped C/B is identified.*

ELEC DC BAT BUS ALTN

Applicable to: ALL

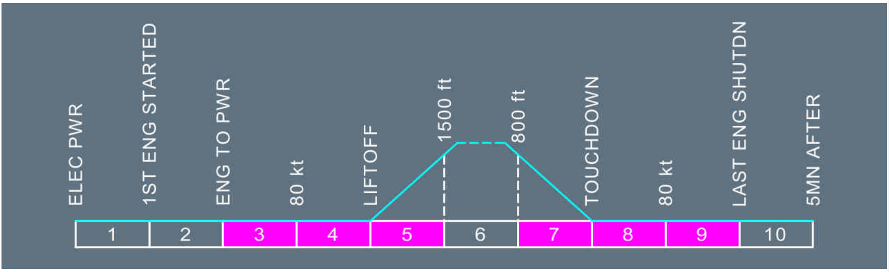
Ident.: PRO-ABN-ELEC-AK-00017370.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC BAT BUS is abnormally supplied by DC BUS 2.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-AK-00015754.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ELEC-AK-00015755.0001001 / 09 SEP 14

STATUS

INOP SYS

CAT 3 DUAL

ELEC DC BAT BUS FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

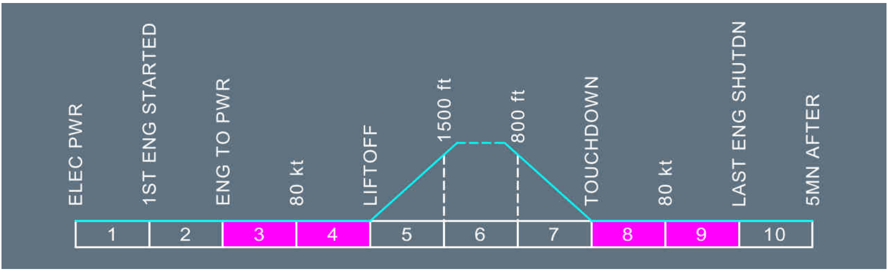
Ident.: PRO-ABN-ELEC-AG-00017361.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC BAT busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-AG-00012389.0001001 / 27 JAN 11

ENG HI IDLE

L2 *Due to the loss of the EIVMUs.*

Ident.: PRO-ABN-ELEC-AG-00012386.0003001 / 07 JUL 20

STATUS

LDG DIST PROC.. APPLY

ENG 1 AUTO START ONLY
ENG 2 AUTO START ONLY
ENG HI IDLE

INOP SYS

A/THR
REVERSERS
MAN CAB PR
APU LOOP B

Other INOP SYS

APU SQUIB B

ELEC DC BAT BUS FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

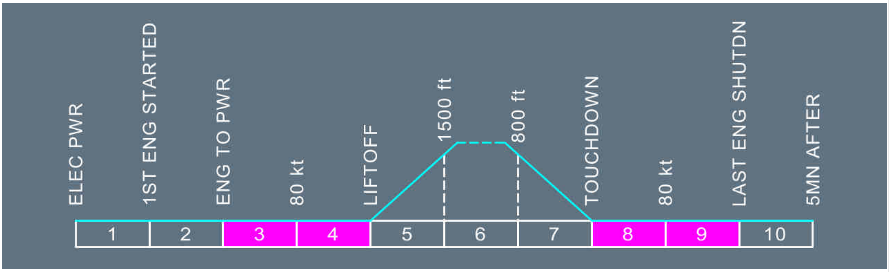
Ident.: PRO-ABN-ELEC-AG-00017361.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC BAT busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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4
5
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9
10

Ident.: PRO-ABN-ELEC-AG-00012389.0001001 / 27 JAN 11

ENG HI IDLE

L2 *Due to the loss of the EIVMUs.*

Continued on the following page

ELEC DC BAT BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AG-00012386.0001001 / 27 JAN 11

STATUS

ENG 1 AUTO START ONLY
ENG 2 AUTO START ONLY
ENG 1 HI IDLE
ENG 2 HI IDLE
CAT 2 ONLY

INOP SYS

A/THR
REVERSERS
MAN CAB PR
APU LOOP B

Other INOP SYS

APU SQUIB B
CAPT PHC
STBY PHC

ELEC DC BUS 1 FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

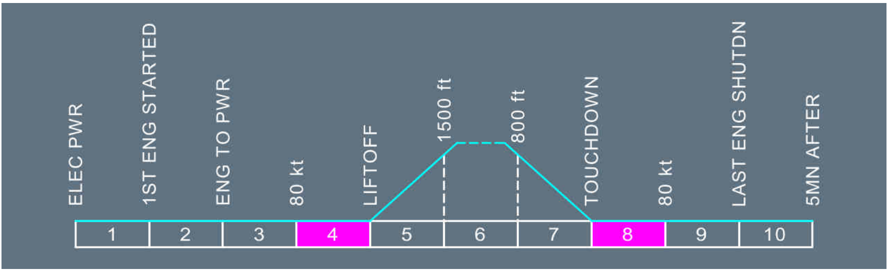
Ident.: PRO-ABN-ELEC-AB-00017345.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC 1 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC DC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AB-00018436.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ELEC-AB-00019401.0021001 / 07 JUL 20

STATUS

LDG DIST PROC.. APPLY

PACK 1 AT FIXED TEMP
CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

VHF 3
L+R STBY STAT HEAT
TR 1
PART GALLEY (1)
R FUEL STBY
PACKBAY VENT
JETTISON ◁

FUEL AFT XFR
ACP 3
G ELEC PUMP
L FUEL STBY
ZONE CTLR 1
C/B MONITOR

L+R CAPT STAT HEAT
CAT 3 DUAL
B ELEC PUMP
R FUEL PUMP 2
GND COOL
REV 1 (GE engine only)

Other INOP SYS

SELCAL
PACK 1 REGUL
PART COCKPIT LTS
RMP 3

TPIS ◁
CAPT WIPER
HUD ◁
R LDG LTS

BLOW DET
DATA LOADER
Brake Temp ind. (5 to 8)

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

(1) *(not applicable to A330-200F)*

ELEC DC BUS 1 FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

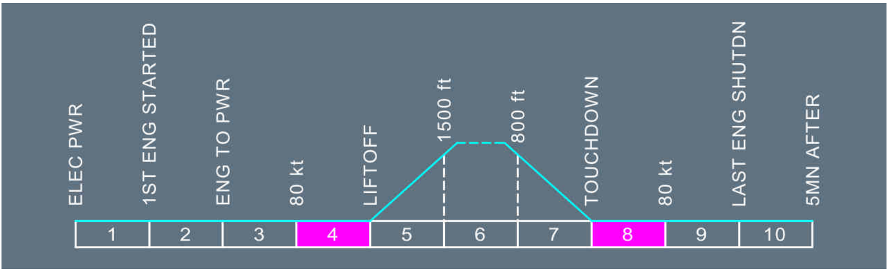
Ident.: PRO-ABN-ELEC-AB-00017345.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC 1 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ELEC-AB-00018436.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

ELEC DC BUS 1 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AB-00019401.0002001 / 21 MAR 16

L12

STATUS

PACK 1 AT FIXED TEMP
CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

VHF 3
L+R STBY STAT HEAT
TR 1
PART GALLEY [1]
R FUEL STBY
PACKBAY VENT
JETTISON ◁✻

FUEL AFT XFR
ACP 3
G ELEC PUMP
L FUEL STBY
ZONE CTLR 1
C/B MONITOR

L+R CAPT STAT HEAT
CAT 3 DUAL
B ELEC PUMP
R FUEL PUMP 2
GND COOL
REV 1 (GE engine only)

Other INOP SYS

SELCAL
PACK 1 REGUL
PART COCKPIT LTS
RMP 3

TPIS ◁✻
CAPT WIPER
HUD ◁✻
R LDG LTS

BLOW DET
DATA LOADER
Brake Temp ind. (5 to 8)

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

[1] *(not applicable to A330-200F)*

ELEC DC BUS 2 FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

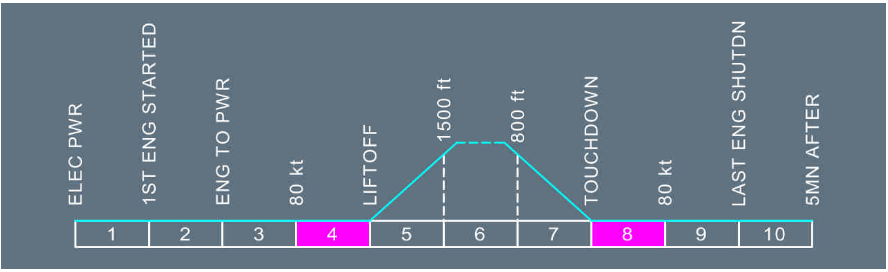
Ident.: PRO-ABN-ELEC-AC-00017346.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC 2 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AC-00018451.0002001 / 21 MAR 16

AIR DATA SWTG (IF ADR 3 AVAIL)..F/O ON 3
FM SOURCE..BOTH ON 1
PAX BBAND ....OFF
SEC 2..KEEP ON

L2 *Note:* *SEC 2 is normally supplied by DC BUS 2. In case of a DC BUS 2 failure, the DC ESS BUS supplies SEC 2. However, in this case, the SEC 2 FAULT light, on the overhead panel, comes on. Do not attempt a reset: Selecting OFF would result in a loss of the SEC 2 backup power supply.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **IF CG AFT 32 %, AND WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE..FWD

SECONDARY FAILURES

*F/CTL

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AC-00018452.0029001 / 10 MAY 21

L12

STATUS

SPD BRK...DO NOT USE

- **If HYD G SYS LO PR or HYD Y SYS LO PR is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

- **IF CG AFT 32 %, WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE...FWD

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

PACK 2 AT FIXED TEMP
BOTH PFD ON SAME FMGEC
SLATS/FLAPS SLOW
CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

PRIM 2+3
AP 2 (FMGC 2)
FUEL AFT XFR
CAT 3 DUAL
Y ELEC PUMP
PART FCU
GALLEY
F T.TK PUMP
BBAND FAN

FCU (1)
VHF 2
L+R F/O STAT HEAT
TR 2
R WSHLD HEAT
LGCIU 2
L FUEL PUMP 1
R WNDW HEAT
FCDC 2

FCDU 1+2 (1)
HALF SPLRS
FM 2
BRAKES SYS 2
BMC 2
CAB PR 2
R FUEL PUMP 1
ZONE CTLR 2
RUD TRIM 2

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

RUD TVR LIM 2
F/O TAT
FCMC 2
REV 2 (GE engine only)
ENG 1+2 LOOP B

Other INOP SYS

PACK 2 REGUL
CARGO SQUIB B
ENG 1+2 SQUIB B
RMP 2
SDCU 2 or CIDS-SF 2
F/O WIPER
AUTOBRAKE
PART COCKPIT LTS
BRAKE TEMP IND (1 to 4)
F/O RAIN REPELLENT
SFCC 2
CDLS

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *(If DC ESS BUS is lost)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC DC BUS 2 FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

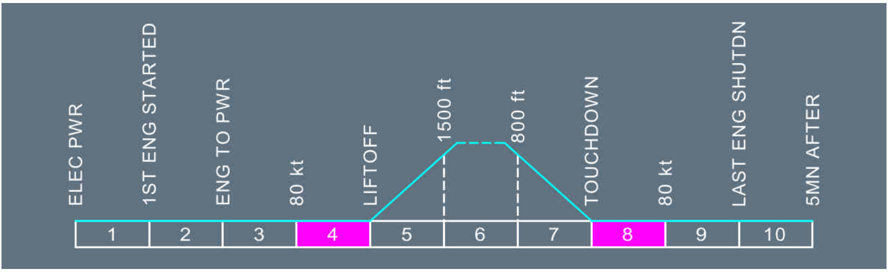
Ident.: PRO-ABN-ELEC-AC-00017346.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC 2 busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AC-00018451.0002001 / 21 MAR 16

AIR DATA SWTG (IF ADR 3 AVAIL)..F/O ON 3
FM SOURCE..BOTH ON 1
PAX BBAND ◁✳ ....OFF
SEC 2..KEEP ON

L2 *Note:* *SEC 2 is normally supplied by DC BUS 2. In case of a DC BUS 2 failure, the DC ESS BUS supplies SEC 2. However, in this case, the SEC 2 FAULT light, on the overhead panel, comes on. Do not attempt a reset: Selecting OFF would result in a loss of the SEC 2 backup power supply.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **IF CG AFT 32 %, AND WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE..FWD

SECONDARY FAILURES

*F/CTL

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AC-00018452.0007001 / 10 MAY 21

L12

STATUS

SPD BRK..DO NOT USE

- **IF CG AFT 32 %, WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE..FWD

LDG DIST PROC... APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

PACK 2 AT FIXED TEMP

BOTH PFD ON SAME FMGEC

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

PRIM 2+3
HALF SPLRS
FM 2
BRAKES SYS 2
BMC 2
GALLEY
F T.TK PUMP
BBAND VENT ◁
FCMC 2
REV 2 (GE engine only)

AP 2 (FMGC 2)
FUEL AFT XFR
CAT 3 DUAL
Y ELEC PUMP
LGCIU 2
L FUEL PUMP 1
R WNDW HEAT
FCDC 2
ENG 1+2 LOOP B

VHF 2
L+R F/O STAT HEAT
TR 2
R WSHLD HEAT
CAB PR 2
R FUEL PUMP 1
ZONE CTLR 2
RUD TRIM 2
F/O TAT

Other INOP SYS

PACK 2 REGUL

SDCU 2 or CIDS-SF ◁ 2

BRAKE TEMP IND (1 to 4)

Continued on the following page

ELEC DC BUS 2 FAULT (Cont'd)

CARGO SQUIB B
ENG 1+2 SQUIB B
RMP 2
F/O WIPER
AUTOBRAKE
PART COCKPIT LTS
F/O RAIN REPELLENT
SFCC 2
CDLS

Note: The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC DC BUS 1+2 FAULT

Applicable to: ALL

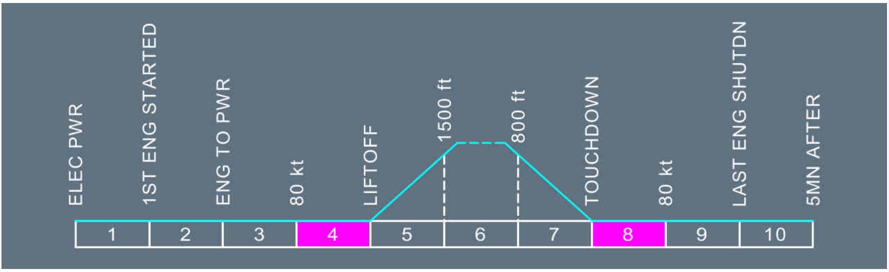
Ident.: PRO-ABN-ELEC-AF-00017347.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC 1 and DC 2 busbars are not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AF-00018443.0006001 / 09 MAY 17

- **IF NO FUEL LEAK**

  WING X FEED..ON

L2 *Only the L FUEL PUMP 2 is supplied.*

L1 FM SOURCE..BOTH ON 1

PAX BBAND ....OFF

SEC 2..KEEP ON

FUEL IMBALANCE..MONITOR

L2 *Due to the fact that fuel is fed from one side only, the flight crew must monitor fuel balance. To maintain fuel balance, L PUMP 2 can be set to OFF. R PUMP 2 will then automatically start, and the corresponding FAULT light will go off.*

L1 CTK TANK XFR BY GRVTY

CTR TANK UNUSABLE IF < 15 T

FUEL CONSUMPT INCRSD

FMS PRED UNRELIABLE

- **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**

  T TANK MODE..FWD

SECONDARY FAILURES

*F/CTL

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AF-00019416.0012001 / 10 MAY 21

L12

STATUS

SPD BRK......DO NOT USE

APPR PROC

- **FOR L/G GRVTY EXTN:**
  MAX SPEED......200 KT
  L/G GRVTY EXTN......DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G......DOWN
- **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**
  TTK MODE......FWD

LDG DIST PROC......APPLY

FUEL CONSUMPT INCRSD
See (1)
CTR TANK XFR BY GRVTY
CTR TANK UNUSABLE IF < 15 T
R FUEL GRVTY FEED ONLY
ENG 1 AUTO START ONLY
ENG 2 AUTO START ONLY
FMS PRED UNRELIABLE
See (2)
PACKS AT FIXED TEMP
ENG HI IDLE
BOTH PFD ON SAME FMGEC
SLATS/FLAPS SLOW

INOP SYS

See below

INOP SYS

PRIM 2+3
VHF 2+3
AP 2
REVERSERS
TR 1+2
FUEL AFT XFR

Continued on the following page

ELEC DC BUS 1+2 FAULT (Cont'd)

L+R CAPT STAT HEAT
ACP 3
ZONE REGUL
B ELEC PUMP
BMC 2
GALLEY
L FUEL STBY
R WNDW HEAT
C/B MONITOR
RUD TRIM 2
HALF SPLRS
REAC W/S DET

L+R F/O STAT HEAT
FM 2
BRAKES SYS 2
Y ELEC PUMP
LGCIU 2
R FUEL PUMPS
F CTR PUMPS
GND COOL ◁
FCDC 2
ENG 1+2 LOOP B
MAN CAB PR
N/W STRG

L+R STBY STAT HEAT
CAT 2
G ELEC PUMP
R WSHLD HEAT
CAB PR 2
L FUEL PUMP 1
F T.TK PUMP
BBAND FAN ◁
FCMC 2
A/THR
F/CTL PROT
GLS AUTOLAND ◁

Other INOP SYS

RMP 2+3
DATA LOADER
TPIS ◁
L/G SAFETY VALVE
SDCU 2 or CIDS-SF ◁ 2
ENG SQUIB B

PACK 1+2 REGUL
R LDG LTS
WIPERS
PART COCKPIT LTS
BLOW DET
SFCC 2

SELCAL
F/O RAIN REPELLENT ◁
BRAKE TEMP IND
AUTOBRAKE
CARGO SQUIB B
CDLS

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC DC ESS BUS FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

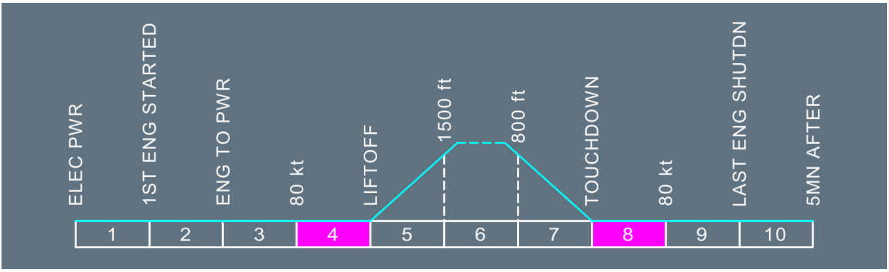
Ident.: PRO-ABN-ELEC-AD-00017348.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AD-00018437.0005001 / 22 MAR 17

L2 AC ESS SHED, DC ESS SHED and AC LAND RCVRY buses are also lost.
For AC ESS SHED and DC ESS SHED BUS FAULT, refer to the corresponding cautions for additional procedures.

L1 ECAM SWTG DMC..3

L2 *Allows the STATUS page to be recovered.*

L1 PFD BARO REF: STD ONLY

L2 *This line is only displayed, if the DC2 BUS is also lost.*
In this case, the BARO REF .... CHECK line is not displayed.

L1 AUDIO SWTG..SELECT
VHF 2 OR 3/ATC 2..USE
BARO REF..CHECK
GPWS SYS.. OFF

- **If ELEC DC BUS 2 FAULT or HYD B SYS LO PR is triggered:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE
T TK UNUSBL PROC..APPLY

L12

Note: 1. *To shut down the engines on ground, use the fire pb.*
2. *Trim tank fuel may be trapped and become unusable, depending on the position of the valves (associated with the forward transfer) at the moment the failure occurs.*
In this case, Refer to PRO-ABN-FUEL [QRH] TRIM TANK FUEL UNUSABLE.

Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AD-00019400.0056001 / 03 NOV 23

L12

STATUS

AVOID ICING CONDITIONS

- **If above FL 200 and ELEC DC BUS 2 FAULT is triggered:**
  SPD BRK..DO NOT USE
- **If ELEC DC BUS 2 FAULT or HYD B SYS LO PR is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.
- **IF SEVERE ICE ACCRETION**
  MIN SPD..VLS + 10/G DOT

  The speed must not be below:
  - *Green Dot when in CONF 0*
  - *VLS + 10 kt for other configurations.*

  MANEUVER WITH CARE

APPR PROC

GPWS FLAP MODE..OFF

- **IF SEVERE ICE ACCRETION**
  APPR SPD..VLS + 10 KT

LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

BOTH PFD ON SAME FMGEC

SLATS/FLAPS SLOW

INOP SYS

See below

Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

CAT 3 SINGLE ONLY

INOP SYS

FCU (1)
VHF 1
PART FCU
PART GALLEY
GPWS
RUD TRIM 1
BRAKES SYS 1
L WNDOW HEAT
CAPT AOA
ATC 1 or ATC/XPDR 1

ESS TR
ACP 1+2
LGCIU 1
L FUEL PUMP 2
CVR
APU LOOP A
WING A. ICE
HF 1
FM 1
CAT 3 DUAL

FCDC 1+2 (1)
BMC 1
CAB PR 1
R FUEL PUMP 2
FCDC 1
ENG 1+2 LOOP A
L WSHLD HEAT
AP 1
FCMC 1

Other INOP SYS

CAPT ND
STBY ALTIMETER (vibrator)
FLT INTERPHONE
CAPT RAIN REPELLENT ◁✻
CVR
PAX OXY MASKS (auto + manual)
RADAR 1

SFCC 1
FCMC 2 (part)
L/G IND. PANEL
ECP
STBY COMPASS
SDCU 1 or CIDS-SF ◁✻ 1
DME 1

RMP 1
MCDU 1
PRESS INDICATOR
APU
CREW OXY CTL
LANDING LTS CTL

Note: *The alert may be caused by a sub BUS failure. As a result, only a part of the above-listed systems may be lost.*

(1) *(If DC BUS 2 is lost)*
(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC DC ESS BUS FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

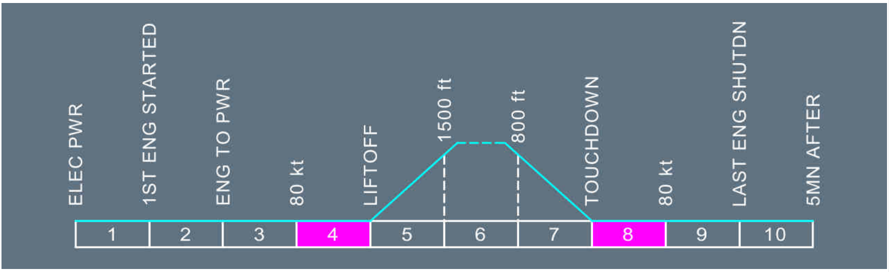
Ident.: PRO-ABN-ELEC-AD-00017348.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AD-00018437.0005001 / 22 MAR 17

L2 AC ESS SHED, DC ESS SHED and AC LAND RCVRY buses are also lost.
For AC ESS SHED and DC ESS SHED BUS FAULT, refer to the corresponding cautions for additional procedures.

L1 ECAM SWTG DMC..3

L2 *Allows the STATUS page to be recovered.*

L1 PFD BARO REF: STD ONLY

L2 *This line is only displayed, if the DC2 BUS is also lost.*
In this case, the BARO REF .... CHECK line is not displayed.

L1 AUDIO SWTG..SELECT
VHF 2 OR 3/ATC 2..USE
BARO REF..CHECK
GPWS SYS..OFF

- **If ELEC DC BUS 2 FAULT or HYD B SYS LO PR is triggered:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE
T TK UNUSBL PROC..APPLY

L12
Note: *1. To shut down the engines on ground, use the fire pb.*
2. Trim tank fuel may be trapped and become unusable, depending on the position of the valves (associated with the forward transfer) at the moment the failure occurs.
In this case, Refer to PRO-ABN-FUEL [QRH] TRIM TANK FUEL UNUSABLE.

Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-AD-00019400.0019001 / 21 MAR 17

L12

STATUS

AVOID ICING CONDITIONS

- **If ELEC DC BUS 2 FAULT or HYD B SYS LO PR is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

- **IF SEVERE ICE ACCRETION**

  MIN SPD..VLS + 10/G DOT

  Note: The speed must not be lower than :
  - *G DOT when in CONF 0, and*
  - *VLS + 10 kt for other configurations.*

  MANEUVER WITH CARE

APPR PROC

GPWS FLAP MODE..OFF

- **IF SEVERE ICE ACRRETION**

  APPR SPD..VLS + 10 KT

  LDG DIST PROC..APPLY

BOTH PFD ON SAME FMGC
SLATS/FLAPS SLOW
CAT 3 SINGLE ONLY

INOP SYS

See below

INOP SYS

ESS TR
ACP 1+2
LGCIU 1
L FUEL PUMP 2
FCDC 1

VHF 1
BMC 1
CAB PR 1
R FUEL PUMP 2
RUD TRIM 1

FUEL AFT XFR
PART FCU
PART GALLEY
GPWS
APU LOOP A

Continued on the following page

ELEC DC ESS BUS FAULT (Cont'd)

ENG 1+2 LOOP A
L WSHLD HEAT
AP 1
FCMC 1

BRAKES SYS 1
L WNDOW HEAT
CAPT AOA
CAT 3 DUAL

WING A. ICE
HF 1
FM 1
ATC 1 or ATC/XPDR 1

Other INOP SYS

CAPT ND
STBY ALTIMETER (vibrator)
FLT INTERPHONE
CAPT RAIN REPELLENT ◁
CVR
PAX OXY AUTO CTL
RADAR 1

SFCC 1
FCMC 2 (part)
L/G IND. PANEL
ECP
STBY COMPASS
SDCU 1 or CIDS-SF ◁ 1
DME 1

RMP 1
MCDU 1
PRESS INDICATOR
APU
CREW OXY CTL
LANDING LTS CTL

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

ELEC DC ESS BUS SHED

Applicable to: ALL

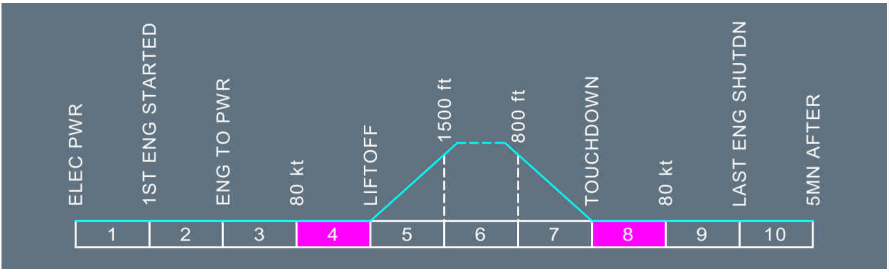
Ident.: PRO-ABN-ELEC-AE-00017349.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the DC SHED ESS busbar is not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-AE-00018455.0003001 / 21 MAR 16

L2 AC ESS SHED BUS is also lost.
Refer to the corresponding caution for additional procedures and status.

L1 FM SOURCE...BOTH ON 2

- **If ELEC DC BUS 2 FAULT or HYD G SYS LO PR is triggered:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE
AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION**
  MIN SPD...VLS +10/G DOT
  MANEUVER WITH CARE

Continued on the following page

ELEC DC ESS BUS SHED (Cont'd)

Ident.: PRO-ABN-ELEC-AE-00018456.0006001 / 21 MAR 17

L12

STATUS

- **If ELEC DC BUS 2 FAULT or HYD G SYS LO PR is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**

  MIN SPD..VLS + 10/G DOT

The speed must not be lower than:

- *G DOT when in CONF 0, and*
- *VLS + 10 kt for other configurations.*

MANEUVER WITH CARE

APPR PROC

GPWS FLAP MODE..OFF

- **IF SEVERE ICE ACCRETION:**

  APPR SPD.. VLS + 10 KT
  LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

BOTH PFD ON SAME FMGEC

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

WING A. ICE
AP 1
FM 1
CAT 3 DUAL
BRAKES SYS 1
L WSHLD HEAT
L WNDOW HEAT
RUD TRIM 1
FCMC 1
JETTISON ◁✻
ATC/XPDR 1

Other INOP SYS

FCMC 2 (part)
STBY ALTIMETER
SFCC FLAPS 1
LANDING LTS CTL
SDCU 1 or CIDS-SDF ◁✻ 1
CREW OXY CTL

Note: *The warning may be caused by a sub BUS failure. Consequently, only a part of the above-listed systems may be lost.*

Continued on the following page

ELEC DC ESS BUS SHED (Cont'd)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC ECMU 1(2) FAULT

Applicable to: ALL

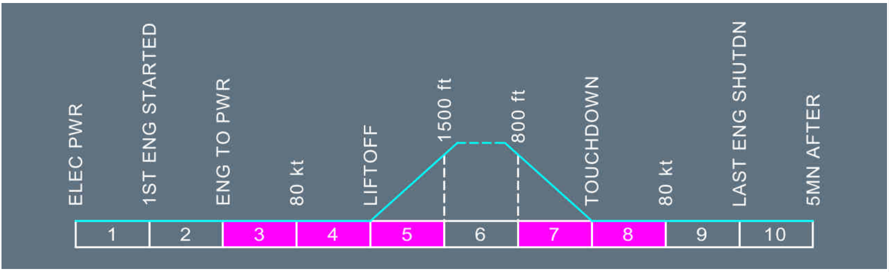
Ident.: PRO-ABN-ELEC-L-00017358.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ECMU is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-L-00012399.0001001 / 27 JAN 11

GEN 1(2).. KEEP ON

L2 *The closure control of associated generator line contactors is lost, but these contactors remain closed provided the GEN pb-sw is at on.*
The associated AC BUS TIE contactors open. The APU line contactor opens if ECMU 1 is affected.

Continued on the following page

ELEC ECMU 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-L-00018471.0001001 / 21 MAR 16

STATUS

GEN 1(2)..KEEP ON

INOP SYS

ECMU 1(2)
APU GEN (if ECMU 1 FAULT)
PART GALLEY
EXT PWR A (1)
EXT PWR B (2)

(1) *(if ECMU 2 FAULT (on ground))*
(2) *(if ECMU 1 FAULT (on ground))*

ELEC EMER CONFIG
(GEN 1 OR/AND GEN 2 RECOVERED OR APU GEN AVAILABLE)

Applicable to: ALL

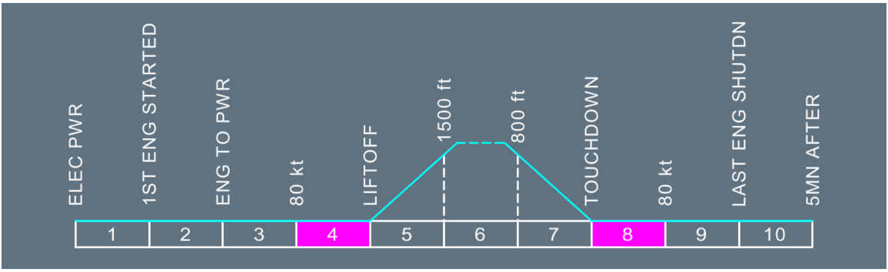
Ident.: PRO-ABN-ELEC-AJ-00019505.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the main generators and all AC busbars are not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN 1 OR/AND GEN 2 RECOVERED OR APU GEN AVAILABLE)

Ident.: PRO-ABN-ELEC-AJ-00012461.0001001 / 29 JUN 16

LAND ASAP

EMER ELEC PWR..MAN ON

L2 *Displayed only if the EMER GEN is not automatically coupled.*

L1 ALL GEN..OFF THEN ON

L2 *When the emergency generator is automatically or manually coupled, and if at least one generator is recovered, the DC and AC ESS buses are still supplied by EMER GEN. The ELEC EMER CONFIG procedure is no longer displayed but replaced on the ECAM by the following procedure and status:*

L12

ASSOCIATED PROCEDURES

FUEL FCMC 1 + 2 FAULT

Refer to PRO-ABN-FUEL FUEL FCMC 1+2 FAULT

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN 1 OR/AND GEN 2 RECOVERED OR APU GEN AVAILABLE)

Ident.: PRO-ABN-ELEC-AJ-00018478.0003001 / 21 MAR 16

L12

STATUS

APPR PROC

- **FOR SLATS EXTENSION:**

  RAT MAN...ON

  LAND RECOVERY...ON

  Selecting LAND RECOVERY pb-sw ON for approach enables recovery of ILS 1, LGCIU 1, BSCU 1, SFCC 1 and WHC 1.
  For aircraft equipped with MMR ◁ , selecting LAND RECOVERY pb-sw ON for approach enables recovery of LGCIU 1, BSCU 1, SFCC 1 and WHC 1.

  GPWS FLAP MODE...OFF

- **FOR L/G GRVTY EXTN:**

  MAX SPEED..200 KT

  L/G GRVTY EXTN...DOWN

  - **WHEN L/G DOWNLOCKED:**

    L/G...DOWN

CONSIDER APU GEN USE

See (1)

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

See (1)

INOP SYS

FUEL AFT XFR
CAT 3 DUAL (1)
GEN 1(2) (1)
PART GALLEY (1)
BSCU CH 1
L WSHLD HEAT
LGCIU 1
R FUEL PUMP 2
L WNDOW HEAT

(1) *When only one generator has been recovered.*

ELEC EMER CONFIG
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Applicable to: LV-GKO, LV-GKP

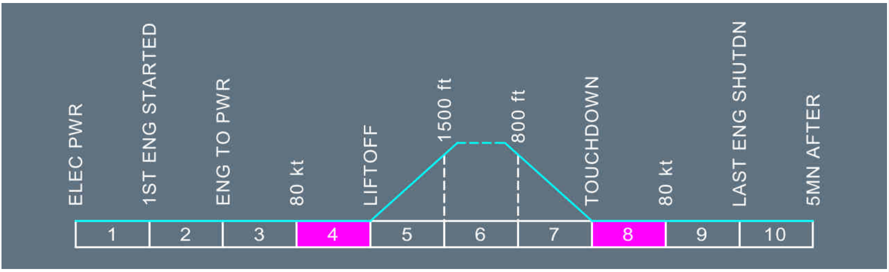
Ident.: PRO-ABN-ELEC-Z-00018637.0001001 / 15 SEP 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the main generators and all AC busbars are not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Ident.: PRO-ABN-ELEC-Z-00019481.0036001 / 03 NOV 22

LAND ASAP

EMER ELEC PWR................................MAN ON

L2 *Displayed only if EMER GEN is not automatically coupled.*

L1 ALL GEN................................OFF THEN ON

L2 *If at any time any GEN 1 or/and GEN 2 recover, or if the APU GEN is available, Refer to PRO-ABN-ELEC ELEC EMER CONFIG (GEN 1 or/and GEN 2 Recovered or APU GEN Available) or Refer to PRO-ABN-ELEC ELEC EMER CONFIG (GEN 1 or/and GEN 2 Recovered or APU GEN Available) - FWSPAGE for the applicable ECAM procedure and status.*

L1 BUS TIE................................OFF

L2 *Setting BUS TIE pb-sw to OFF segregates both generator channels.*

L1 ALL GEN................................OFF THEN ON

MAX FL................................REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

- **If EMER GEN supplied by ENG HYD PUMPS:**

  VHF 1/ATC 1................................USE

- **If EMER GEN supplied by RAT:**

  VHF 1................................USE

L2 *Only VHF 1, HF 1 and ATC 1 are supplied in electrical emergency configuration.*
SELCAL is inoperative.

L1 VENT EXTRACT................................OVRD

L2 *Switch EXTRACT pb-sw to OVRD since extract fan and cabin fans are lost.*

L1

CAUTION	*In the case of discrepancies between airspeed indications on captain PFD and on standby indicator, disregard standby indicator (probe not always deiced: Refer to PRO-ABN-ELEC ELEC EMER CONFIG SYS Remaining).*

L2 *For aircraft equipped with DDRMI , only VOR 1 or ADF 1 (as selected on the DDRMI) is available. The ADF selector/VOR selector position on the FCU must be in accordance with ADF selector/VOR selector on DDRMI.*
Engine anti-ice is ON, regardless of the pushbutton's position, so fuel consumption increases by approximately 1.5 %.

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

L1

- **For aircraft equipped with PW/RR engines:**

  ENG 1+2 N1 DEGRADED MODE

  DO NOT EXCEED N1 LIMIT
  ENG 1 N1 MODE.......ON
  ENG 2 N1 MODE.......ON
  MAN THR.......ADJUST

SEC 2.......KEEP ON
SPD BRK.......DO NOT USE
CTR TANK XFR BY GRAVITY
CTR TK UNUSABLE IF < 15 T
WEIGHT/CG.......INITIALIZE

L2 *This line appears because the FCMCs lose the WEIGHT/CG information, due to the power interruption that occurs before EMER GEN activation.*
The GW and CG must be initialized again in the FCMC, by manually re-entering their values in the FUEL PRED page.
As fuel is fed from one side only, fuel balance must be monitored. To maintain fuel balance, L PUMP 2 can be selected off. R PUMP 2 will then automatically start (its corresponding FAULT light will go off).

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **FOR SLATS EXTENSION:**

  RAT MAN.......ON
  LAND RECOVERY.......ON

L2 *The remaining fuel pump is lost, and the following systems are recovered:*

- *ILS 1, SFCC 1, LGCIU 1, BSCU 1 and WHC*
- *SFCC 1, LGCIU 1, BSCU 1 and WHC 1 for the aircraft equipped with MMR* ⊲ *.*

L1

- **FOR L/G GRVTY EXTN:**

  MAX SPEED.......200 KT
  L/G GRVTY EXTN.......DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G LEVER.......DOWN

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

L2 *In the case of a go-around, gear retraction is not available, and CLIMB performance is degraded.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

SPD BRK........DO NOT USE
MAX SPEED........330/0.82

L2 *Because ailerons are preset upwards, the flight domain limitations, as given in Refer to PRO-ABN-F_CTL F/CTL ELEV REDUND LOST (Ailerons Are Preset Upwards) have to be observed.*

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Ident.: PRO-ABN-ELEC-Z-00018546.0106001 / 03 NOV 22

L12

STATUS

SPD BRK .... DO NOT USE
MAX FL 350
MAX SPEED 330/0.82

APPR PROC

- **FOR SLATS EXTENSION:**
  RAT MAN .... ON
  LAND RECOVERY .... ON
  FOR LDG .... USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
- **FOR L/G GRVTY EXTN:**
  MAX SPEED .... 200 KT
  L/G GRVTY EXTN .... DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G LEVER .... DOWN
- **WHEN L/G DN:**
  MAN PITCH TRIM .... USE
  As Direct law becomes active at landing gear extension, the Automatic Trim is inoperative.

LDG DIST PROC .... APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (3)

ALTN LAW: PROT LOST

- **Only in case of GEN or ENG failure. For this purpose, BUS TIE pb must be switched back to AUTO:**

INOP SYS

F/CTL PROT
PRIM 2+3
RA 1+2
AP 2
See (1)
VHF 2+3
HALF SPLRS
REVERSERS
ADR 2
See (1)
CAT 2
N/W STRG
AUTO BRK
MOST F PUMPS
See (1)
GPS 2
GLS AUTOLAND

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

CONSIDER APU GEN USE
L(R) INR TK: 2T UNUSABLE
CTR TK UNUSABLE IF < 15 T
CTR TO INR: MAN ONLY

● **For A330 aircraft equipped with PW/RR engines:**

ENG 1 N1 DEGRADED MODE
ENG 2 N1 DEGRADED MODE

ENG HI IDLE
FLS ◁* : F-APP + RAW ONLY

STATUS is simplified in ELEC EMER CONFIG. Only the most significant STS items are displayed.

(1) *After LAND RECOVERY pb-sw selection:*
- *SLATS/FLAPS channel 1, LGCIU 1, BSCU 1 and WHC 1 are recovered. But FLAPS remain lost, if ENG 2 failed and IDG 1 lost.*
- *Remaining fuel pump (L FUEL PUMP 2 or R FUEL PUMP 2) stops, leading to 2 t of fuel unusable in each inner tank*
- *SLATS/FLAPS SLOW is displayed as information on STS*
- *AP 1 and ADR 3 are lost.*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC EMER CONFIG
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

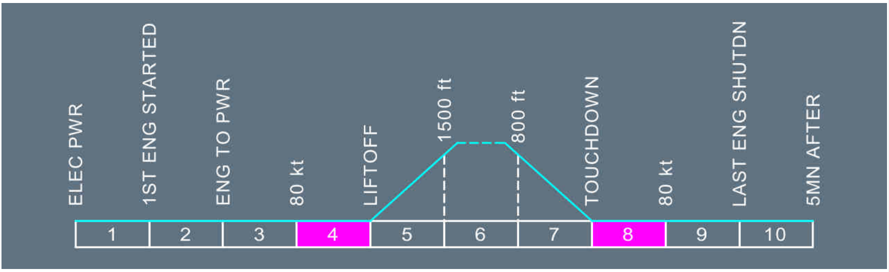
Ident.: PRO-ABN-ELEC-Z-00018637.0001001 / 15 SEP 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the main generators and all AC busbars are not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Ident.: PRO-ABN-ELEC-Z-00019481.0031001 / 03 NOV 22

LAND ASAP

EMER ELEC PWR..........MAN ON

L2 *Displayed only if EMER GEN is not automatically coupled.*

L1 ALL GEN.......... OFF THEN ON

L2 *If at any time any GEN 1 or/and GEN 2 recover, or if the APU GEN is available, Refer to PRO-ABN-ELEC ELEC EMER CONFIG (GEN 1 or/and GEN 2 Recovered or APU GEN Available) or Refer to PRO-ABN-ELEC ELEC EMER CONFIG (GEN 1 or/and GEN 2 Recovered or APU GEN Available) - FWSPAGE for the applicable ECAM procedure and status.*

L1 BUS TIE..........OFF

L2 *Setting BUS TIE pb-sw to OFF segregates both generator channels.*

L1 ALL GEN.......... OFF THEN ON

VHF 1/ATC 1 (IF EMER GEN SUPPLIED BY ENG. HYD PUMPS).......... USE
VHF 1 (IF EMER GEN SUPPLIED BY RAT).......... USE

L2 *Only VHF 1, HF 1 and ATC 1 are supplied in electrical emergency configuration.*
SELCAL is inoperative.

L1 VENT EXTRACT..........OVRD

L2 *Switch EXTRACT pb-sw to OVRD since extract fan and cabin fans are lost.*

L1

CAUTION	*In the case of discrepancies between airspeed indications on captain PFD and on standby indicator, disregard standby indicator (probe not always deiced: Refer to PRO-ABN-ELEC ELEC EMER CONFIG SYS Remaining).*

L2 *For aircraft equipped with DDRMI , only DME 1/VOR 1 or ADF 1 (as selected on the DDRMI) is available. The ADF selector/VOR selector position on the FCU must be in accordance with ADF selector/VOR selector on DDRMI.*
Engine anti-ice is ON, regardless of the pushbutton's position, so fuel consumption increases by approximately 1.5 %.

L1
- **For aircraft equipped with PW/RR engines:**

  ENG 1+2 N1 DEGRADED MODE

  DO NOT EXCEED N1 LIMIT
  ENG 1 N1 MODE..........ON
  ENG 2 N1 MODE..........ON
  MAN THR..........ADJUST

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

SEC 2............KEEP ON
SPD BRK............DO NOT USE
CTR TANK XFR BY GRAVITY
CTR TK UNUSABLE IF < 15 T
WEIGHT/CG............INITIALIZE

L2 *This line appears because the FCMCs lose the WEIGHT/CG information, due to the power interruption that occurs before EMER GEN activation.*
The GW and CG must be initialized again in the FCMC, by manually re-entering their values in the FUEL PRED page.
As fuel is fed from one side only, fuel balance must be monitored. To maintain fuel balance, L PUMP 2 can be selected off. R PUMP 2 will then automatically start (its corresponding FAULT light will go off).

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **FOR SLATS EXTENSION:**

  RAT MAN............ON
  LAND RECOVERY............ON

L2 *The remaining fuel pump is lost, and the following systems are recovered:*

- *ILS 1, SFCC 1, LGCIU 1, BSCU 1 and WHC*
- *SFCC 1, LGCIU 1, BSCU 1 and WHC 1 for the aircraft equipped with MMR* ◁ .

L1
- **FOR L/G GRVTY EXTN:**

  MAX SPEED............200 KT
  L/G GRVTY EXTN............DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G LEVER............DOWN

L2 *In the case of a go-around, gear retraction is not available, and CLIMB performance is degraded.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
SPD BRK............DO NOT USE

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

MAX SPEED..330/0.82

L2 *Because ailerons are preset upwards, the flight domain limitations, as given in Refer to PRO-ABN-F_CTL F/CTL ELEV REDUND LOST (Ailerons Are Preset Upwards) have to be observed.*

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Ident.: PRO-ABN-ELEC-Z-00018546.0014001 / 03 NOV 22

L12

STATUS

SPD BRK..DO NOT USE
MAX FL..350
MAX SPEED..330/0.82

APPR PROC

- **FOR SLATS EXTENSION:**
  RAT MAN..ON
  LAND RECOVERY..ON
  FOR LDG..USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
- **FOR L/G GRVTY EXTN:**
  MAX SPEED..200 KT
  L/G GRVTY EXTN..DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G LEVER..DOWN
- **WHEN L/G DN:**
  MAN PITCH TRIM..USE
  As Direct law becomes active at landing gear extension, the Automatic Trim is inoperative.

LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

ALTN LAW: PROT LOST

- **Only in case of GEN or ENG failure. For this purpose, BUS TIE pb must be switched back to AUTO:**

INOP SYS

F/CTL PROT
PRIM 2+3
RA 1+2
AP 2
See (1)
VHF 2+3
HALF SPLRS
REVERSERS
ADR 2
See (1)
CAT 2
N/W STRG
MOST F PUMPS
See (1)
GPS 2
GLS AUTOLAND

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

CONSIDER APU GEN USE
L(R) INR TK: 2T UNUSABLE
CTR TK UNUSABLE IF < 15 T
CTR TO INR: MAN ONLY

- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE
  ENG 2 N1 DEGRADED MODE

ENG HI IDLE
FLS ◁ : F-APP + RAW ONLY

STATUS is simplified in ELEC EMER CONFIG. Only the most significant STS items are displayed.

(1) *After LAND RECOVERY pb-sw selection:*
- *SLATS/FLAPS channel 1, LGCIU 1, BSCU 1 and WHC 1 are recovered. But FLAPS remain lost, if ENG 2 failed and IDG 1 lost.*
- *Remaining fuel pump (L FUEL PUMP 2 or R FUEL PUMP 2) stops, leading to 2 t of fuel unusable in each inner tank*
- *SLATS/FLAPS SLOW is displayed as information on STS*
- *AP 1 and ADR 3 are lost.*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC EMER CONFIG
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-KHT

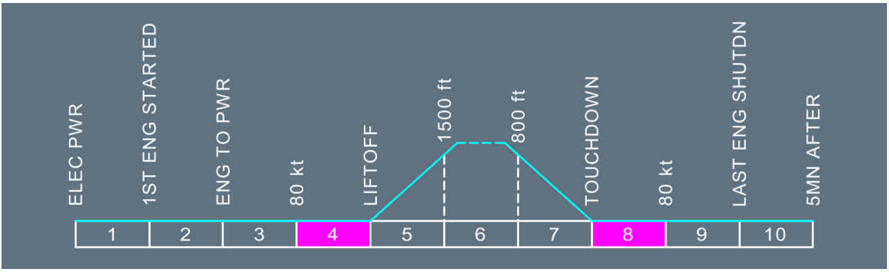
Ident.: PRO-ABN-ELEC-Z-00018637.0001001 / 15 SEP 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the main generators and all AC busbars are not supplied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Ident.: PRO-ABN-ELEC-Z-00019481.0032001 / 03 NOV 22

LAND ASAP

EMER ELEC PWR...MAN ON

L2 *Displayed only if EMER GEN is not automatically coupled.*

L1 ALL GEN... OFF THEN ON

L2 *If at any time any GEN 1 or/and GEN 2 recover, or if the APU GEN is available, Refer to PRO-ABN-ELEC ELEC EMER CONFIG (GEN 1 or/and GEN 2 Recovered or APU GEN Available) or Refer to PRO-ABN-ELEC ELEC EMER CONFIG (GEN 1 or/and GEN 2 Recovered or APU GEN Available) - FWSPAGE for the applicable ECAM procedure and status.*

L1 BUS TIE...OFF

L2 *Setting BUS TIE pb-sw to OFF segregates both generator channels.*

L1 ALL GEN... OFF THEN ON

MAX FL... REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

- **If EMER GEN supplied by ENG HYD PUMPS:**

  VHF 1/ATC 1...USE

- **If EMER GEN supplied by RAT:**

  VHF 1...USE

L2 *Only VHF 1, HF 1 and ATC 1 are supplied in electrical emergency configuration.*
SELCAL is inoperative.

L1 VENT EXTRACT...OVRD

L2 *Switch EXTRACT pb-sw to OVRD since extract fan and cabin fans are lost.*

L1

CAUTION	*In the case of discrepancies between airspeed indications on captain PFD and on standby indicator, disregard standby indicator (probe not always deiced: Refer to PRO-ABN-ELEC ELEC EMER CONFIG SYS Remaining).*

L2 *For aircraft equipped with DDRMI ✱ , only DME 1/VOR 1 or ADF 1 (as selected on the DDRMI) is available. The ADF selector/VOR selector position on the FCU must be in accordance with ADF selector/VOR selector on DDRMI.*
Engine anti-ice is ON, regardless of the pushbutton's position, so fuel consumption increases by approximately 1.5 %.

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

L1
- **For aircraft equipped with PW/RR engines:**

  ENG 1+2 N1 DEGRADED MODE

  DO NOT EXCEED N1 LIMIT
  ENG 1 N1 MODE....................ON
  ENG 2 N1 MODE....................ON
  MAN THR....................ADJUST

SEC 2....................KEEP ON
SPD BRK....................DO NOT USE
CTR TANK XFR BY GRAVITY
CTR TK UNUSABLE IF < 15 T
WEIGHT/CG....................INITIALIZE

L2 *This line appears because the FCMCs lose the WEIGHT/CG information, due to the power interruption that occurs before EMER GEN activation.*
The GW and CG must be initialized again in the FCMC, by manually re-entering their values in the FUEL PRED page.
As fuel is fed from one side only, fuel balance must be monitored. To maintain fuel balance, L PUMP 2 can be selected off. R PUMP 2 will then automatically start (its corresponding FAULT light will go off).

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **FOR SLATS EXTENSION:**

  RAT MAN....................ON
  LAND RECOVERY....................ON

L2 *The remaining fuel pump is lost, and the following systems are recovered:*

- *ILS 1, SFCC 1, LGCIU 1, BSCU 1 and WHC*
- *SFCC 1, LGCIU 1, BSCU 1 and WHC 1 for the aircraft equipped with MMR* ◁ .

L1
- **FOR L/G GRVTY EXTN:**

  MAX SPEED....................200 KT
  L/G GRVTY EXTN....................DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G LEVER....................DOWN

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

L2 *In the case of a go-around, gear retraction is not available, and CLIMB performance is degraded.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
SPD BRK....................DO NOT USE
MAX SPEED....................330/0.82

L2 *Because ailerons are preset upwards, the flight domain limitations, as given in Refer to PRO-ABN-F_CTL F/CTL ELEV REDUND LOST (Ailerons Are Preset Upwards) have to be observed.*

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

Ident.: PRO-ABN-ELEC-Z-00018546.0106001 / 03 NOV 22

L12

STATUS

SPD BRK..DO NOT USE
MAX FL..350
MAX SPEED..330/0.82

APPR PROC

- **FOR SLATS EXTENSION:**
  RAT MAN..ON
  LAND RECOVERY..ON
  FOR LDG..USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
- **FOR L/G GRVTY EXTN:**
  MAX SPEED..200 KT
  L/G GRVTY EXTN..DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G LEVER..DOWN
- **WHEN L/G DN:**
  MAN PITCH TRIM..USE
  As Direct law becomes active at landing gear extension, the Automatic Trim is inoperative.

LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

ALTN LAW: PROT LOST

- **Only in case of GEN or ENG failure. For this purpose, BUS TIE pb must be switched back to AUTO:**

INOP SYS

F/CTL PROT
PRIM 2+3
RA 1+2
AP 2
See (1)
VHF 2+3
HALF SPLRS
REVERSERS
ADR 2
See (1)
CAT 2
N/W STRG
AUTO BRK
MOST F PUMPS
See (1)
GPS 2
GLS AUTOLAND

Continued on the following page

ELEC EMER CONFIG (Cont'd)
(GEN NOT RECOVERED AND APU GEN NOT AVAILABLE)

CONSIDER APU GEN USE
L(R) INR TK: 2T UNUSABLE
CTR TK UNUSABLE IF < 15 T
CTR TO INR: MAN ONLY

- **For A330 aircraft equipped with PW/RR engines:**
  ENG 1 N1 DEGRADED MODE
  ENG 2 N1 DEGRADED MODE

ENG HI IDLE
FLS ◁✳ : F-APP + RAW ONLY

STATUS is simplified in ELEC EMER CONFIG. Only the most significant STS items are displayed.

(1) *After LAND RECOVERY pb-sw selection:*
- *SLATS/FLAPS channel 1, LGCIU 1, BSCU 1 and WHC 1 are recovered. But FLAPS remain lost, if ENG 2 failed and IDG 1 lost.*
- *Remaining fuel pump (L FUEL PUMP 2 or R FUEL PUMP 2) stops, leading to 2 t of fuel unusable in each inner tank*
- *SLATS/FLAPS SLOW is displayed as information on STS*
- *AP 1 and ADR 3 are lost.*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

ELEC GEN 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-D-00017350.0001001 / 21 MAR 16

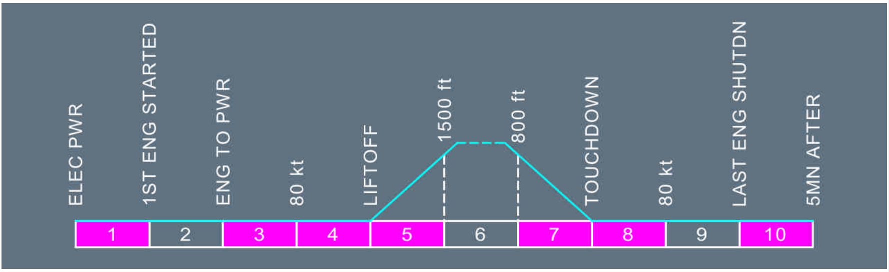
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when:
- The protection trip is initiated by the associated GCU, or
- The line contactor is open with GEN pb-sw set to ON.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ELEC-D-00012372.0001001 / 27 JAN 11

GEN (AFFECTED)..OFF THEN ON

- **IF UNSUCCESSFUL:**
  GEN (AFFECTED)..OFF

Continued on the following page

ELEC GEN 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-D-00018602.0002001 / 21 MAR 16

L12

STATUS

CONSIDER APU GEN USE

See [3]

- **Only if APU GEN is not in line:**
  CAT 3 SINGLE ONLY

INOP SYS

GEN 1(2)
PART GALLEY [1]
CAT 3 DUAL [2]

(1) *(Only if APU GEN is not in line, not applicable to A330-200F)*
(2) *(Only if APU GEN is not in line.)*
(3) *The APU, if available, may be started.*

ELEC GEN 1(2) OFF

Applicable to: ALL

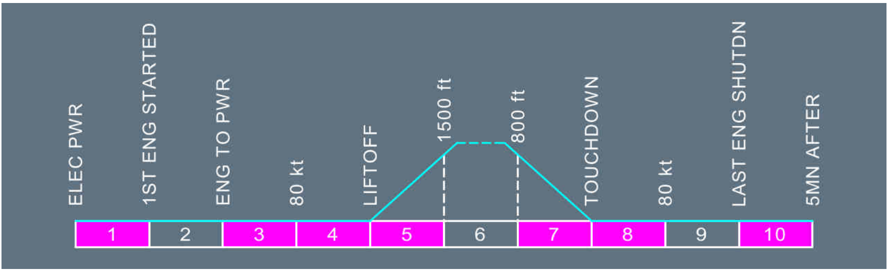
Ident.: PRO-ABN-ELEC-E-00017351.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the GEN 1(2) pb-sw is abnormally set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
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8
9
10

Continued on the following page

ELEC GEN 1(2) OFF (Cont'd)

Ident.: PRO-ABN-ELEC-E-00012378.0001001 / 25 FEB 14

Crew awareness.

L2 Switch affected GEN on.

Ident.: PRO-ABN-ELEC-E-00018614.0001001 / 21 MAR 16

STATUS

INOP SYS

GEN 1(2)
PART GALLEY (1)
CAT 3 DUAL (2)

(1) *(Only if APU GEN is not in line, not applicable to A330-200F)*
(2) *(Only if APU GEN is not in line)*

ELEC GEN 1(2)/APU GEN/EXT PWR OVERLOAD

Applicable to: ALL

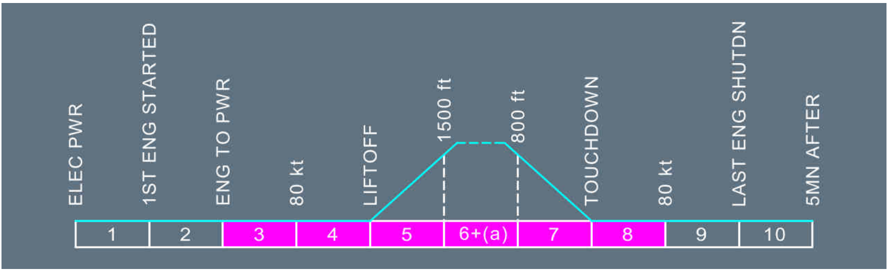
Ident.: PRO-ABN-ELEC-K-00017354.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the load of one generator is above 100% of rated output.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6+(a)
7
8
9
10

Note: *(a) Alert is inhibited in flight phase 6 for EXT PWR OVERLOAD only.*

Ident.: PRO-ABN-ELEC-K-00012396.0001001 / 18 AUG 10

GALLEY..OFF

L2 *This warning is only displayed if galley automatic shedding has failed.*

Ident.: PRO-ABN-ELEC-K-00012397.0001001 / 18 AUG 10

STATUS

	INOP SYS
	GALLEY

ELEC IDG 1(2) DISCONNECTED
(ON GROUND)

Applicable to: ALL

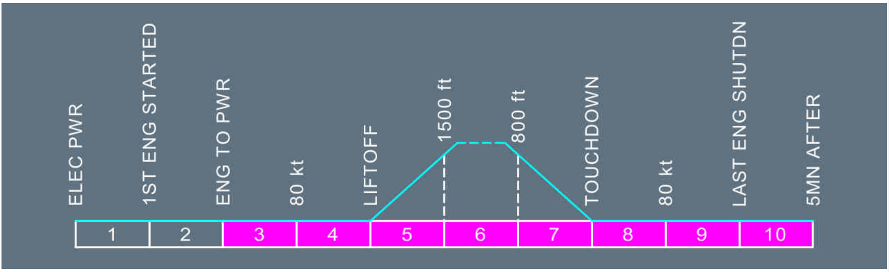
Ident.: PRO-ABN-ELEC-I-00017357.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the IDG is disconnected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ELEC-I-00018619.0001001 / 21 MAR 16

Crew awareness.

L2 For A330 aircraft equipped with PW engines, when an IDG is disconnected, the oil temperature of the affected IDG may increase.

Ident.: PRO-ABN-ELEC-I-00018620.0001001 / 21 MAR 16

STATUS

	INOP SYS
CONSIDER APU GEN USE	GEN 1(2) PART GALLEY (1)

(1) *(only if APU GEN not in line, not applicable to A330-200F)*

ELEC IDG 1(2) OIL LO PR/OVHT

Applicable to: ALL

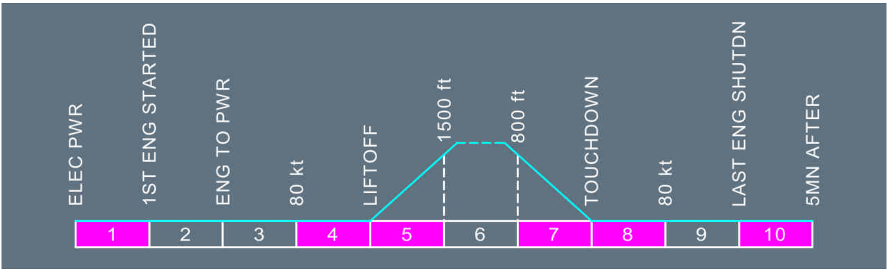
Ident.: PRO-ABN-ELEC-J-00017356.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The alert ELEC IDG 1(2) OIL LO PR triggers when the IDG oil pressure is low. The alert is inhibited if N2 < 14%.
The alert ELEC IDG 1(2) OIL OVHT triggers when the IDG outlet oil temperature is above 185 °C.

Flight Phase Inhibition:



Ident.: PRO-ABN-ELEC-J-00018627.0001001 / 03 MAY 23

IDG (AFFECTED)...OFF

L2 *If the associated engine is running, the IDG must be disconnected from the engine at or above idle to prevent the damage to the disconnect mechanism.*

L1 *Note:* *The IDG disconnection is inhibited, when the engine is stopped or below idle.*
Press the IDG pb-sw until the GEN FAULT light comes on. However, do not press for more than 3 s, to avoid damage to the disconnect solenoid.
The IDG FAULT light goes off, when the IDG is disconnected.

L2 *When the IDG is disconnected before takeoff, the oil temperature of the affected IDG may reach a higher value than during normal operations, but without exceeding 150 °C.*

Continued on the following page

ELEC IDG 1(2) OIL LO PR/OVHT (Cont'd)

Ident.: PRO-ABN-ELEC-J-00018628.0001001 / 21 MAR 16

L12

STATUS

CONSIDER APU GEN USE

See [3]

- **Only if APU GEN is not on line:**

  CAT 3 SINGLE ONLY

INOP SYS

GEN 1(2)

PART GALLEY [1]

CAT 3 DUAL [2]

[1] *(Only if APU GEN is not on line, not applicable to A330-200F)*

[2] *(Only if APU GEN is not on line)*

[3] *The APU, if available, may be started.*

ELEC IDG 1(2) OIL SYS FAULT
(ON GROUND)

Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

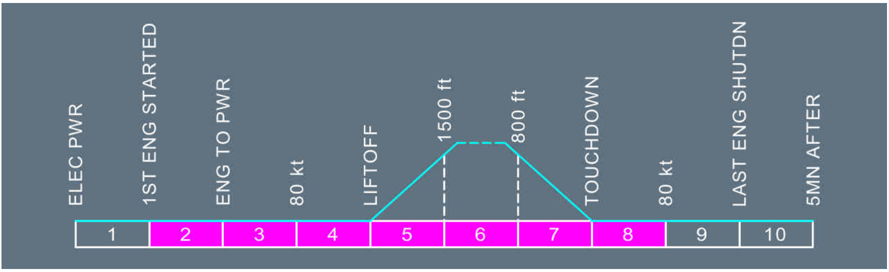
Ident.: PRO-ABN-ELEC-AP-00017373.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ELEC IDG 1(2) OIL SYS FAULT (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ELEC-AP-00012405.0001001 / 05 MAY 22

Crew awareness.

Note: *During pushback, the ECAM may unduly trigger the ELEC IDG 1(2) OIL SYS FAULTdue to IDG oil level variation caused by aircraft movement.*

ELEC IDG 1(2) OIL SYS FAULT
(ON GROUND)

Applicable to: LV-GHQ, LV-GIF

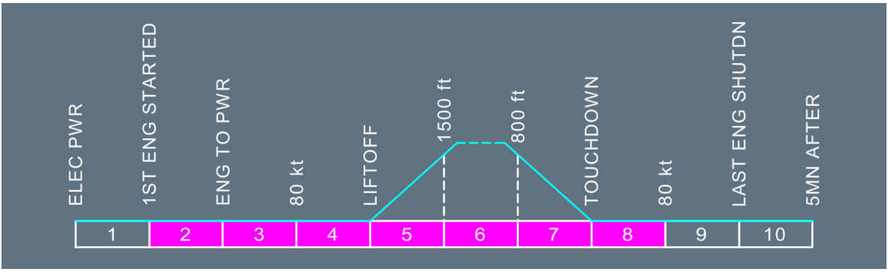
Ident.: PRO-ABN-ELEC-AP-00017373.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-AP-00012405.0002001 / 21 MAR 16

Crew awareness.

ELEC STATIC INV FAULT

Applicable to: ALL

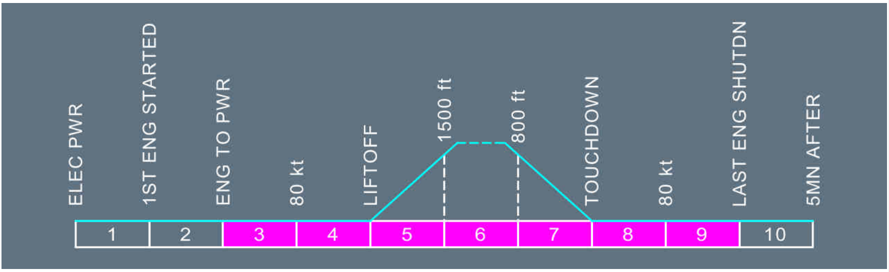
Ident.: PRO-ABN-ELEC-AS-00017371.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the static inverter is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ELEC-AS-00012398.0001001 / 25 FEB 14

Crew awareness.

ELEC TR 1(2) OR APU TR OR ESS TR FAULT

Applicable to: ALL

Ident.: PRO-ABN-ELEC-P-00018583.0002001 / 21 MAR 16

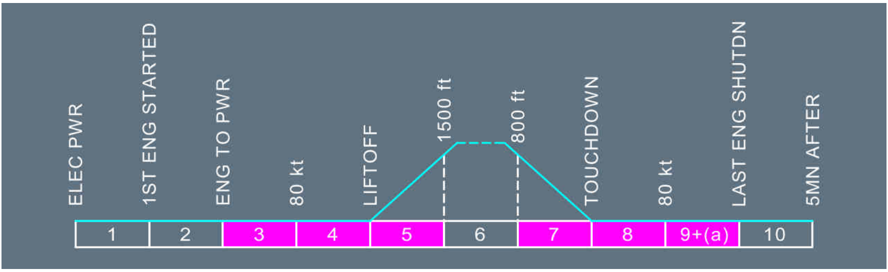
ANNUNCIATIONS

Triggering Conditions:

L2

The ELEC TR 1(2) FAULT alert triggers when the TR 1(2) is failed.
The ELEC ESS TR FAULT alert triggers when the ESS TR is failed.
The ELEC APU TR FAULT alert triggers when the APU TR is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9+(a)
10

Note: (a) Alert inhibited in flight phase 9 for TR 1(2) or ESS TR FAULT only.

Ident.: PRO-ABN-ELEC-P-00018633.0002001 / 21 MAR 16

- **In case of an APU TR fault:**
  - **IF APU NOT REQUIRED:**

    APU BAT....................OFF

Continued on the following page

ELEC TR 1(2) OR APU TR OR ESS TR FAULT (Cont'd)

Ident.: PRO-ABN-ELEC-P-00012409.0001001 / 21 NOV 11

STATUS

- **If APU TR fault, and APU BAT off:**
  - **FOR APU START:**
    APU BAT.. ON
- **if TR 1 or 2 is failed:**
  CAT 3 SINGLE ONLY

INOP SYS

TR 1(2) or APU TR or ESS TR
CAT 3 DUAL (1)

(1) *(if TR 1 or 2 is failed)*

[QRH] ALL ENG FAIL

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Ident.: PRO-ABN-ENG-AK-00017076.0007001 / 10 NOV 22

L2 The flight crew must apply this paper procedure when required by the ENG ALL ENGINES FAILURE ECAM alert.

During the application of the ALL ENGINES FAILURE paper procedure:
- If one or more engines relight, apply the corresponding ECAM procedure instead, or
- If none of the engines relights, continue to apply the ALL ENGINES FAILURE paper procedure. If there is sufficient time, clear both the ECAM alerts and the ECAM STATUS page.

The purpose of the ENG ALL ENGINES FAILURE ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator.

The ALL ENGINES FAILURE paper procedure includes a fuel quantity check to determine if either of the following applies:
- Engine relight can be attempted, or
- Engine relight cannot be attempted.

If engine relight can be attempted, the flight crew can attempt successive engine relights. First without the APU bleed (windmill start), then with the APU bleed, if available.
If engine relight cannot be attempted, the flight crew must apply the procedure for forced landing or ditching.

L1 First apply the following actions of the ENG ALL ENGINES FAILURE ECAM procedure (if not already applied):

LAND ASAP

RAT....................MAN ON
EMER ELEC PWR MAN ON pb....................PRESS
OPTIMUM RELIGHT SPEED....................270/0.82

L2

PITCH TARGET IN CASE OF SPEED INDICATION FAILURE	
GROSS WEIGHT	***Pitch (°)***
At or below 150 000 kg / 330 000 lb	*-1.5*
170 000 kg / 374 000 lb	*-0.5*
190 000 kg / 418 000 lb	*0.0*
210 000 kg / 462 000 lb	*0.5*
230 000 kg / 506 000 lb	*1.5*
At or above 250 000 kg / 550 000 lb	*2.0*

L1 APU (below FL 250)....................START

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

THR LEVERS.......................................IDLE
GLIDING DISTANCE: 2 NM / 1000 FT

L2

AT 270 KT: 2 NM / 1000 FT (500 FT/NM) NO WIND			
Flight Level	*FL 200*	*FL 300*	*FL 400*
Distance (NM)	*40*	*60*	*80*

L1 DIVERSION.......................................INITIATE

L2 *Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.*

L1 Then, as long as none of the engines relights, apply the following paper procedure. If there is sufficient time, clear all ECAM alerts, and clear the ECAM STATUS page.

VHF1.......................................USE
ATC.......................................NOTIFY
CABIN CREW.......................................NOTIFY
SIGNS.......................................ON
CREW OXY MASK (FL > 100).......................................USE
FUEL QUANTITY.......................................CHECK

Ident.: PRO-ABN-ENG-AK-00020850.0002001 / 17 MAR 17

- **If engine relight can be attempted:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight can be attempted.

- **If engine relight cannot be attempted:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight cannot be attempted.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00017100.0004001 / 31 AUG 17

- **If engine relight can be attempted:**
  ENG START sel....IGN / START
  - **Approaching or below FL 300: Windmill Relight**
    ALL ENG MASTERS....OFF 30 S THEN ON
    ENGs RELIGHT....TRY REGULARLY

    L2 *Windmill relight attempts can be repeated until successful, or until the APU bleed is available.*

    L1 APU (below FL 250) ....START
    - **If APU available and windmill relight unsuccessful: Starter Assisted Relight below FL 200**
      ALL ENG MASTERS....OFF
      OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Green Dot Speed*)

      L2 *Green dot speed is the optimum speed for starter-assisted relight with the APU bleed.*

      L1 WING ANTI ICE....OFF
      APU BLEED....ON
      ENG MASTER (one at a time)....ON

      L2 *Between each attempt to relight the same engine, wait at least 30 s with the associated ENG MASTER lever set to OFF.*

L1 SPEED BRAKES AVAILABLE

L2 *Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.*

L1
- **When below 10 000 FT AGL:**
  CABIN AND COCKPIT....PREPARE

  L2
  - *Secure loose equipment*
  - *Prepare survival equipment*
  - *Fasten belts and shoulder harnesses.*

  L1 RAM AIR....ON

  L2 *Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.*

  L1 BARO REF (if avail)....SET

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

COMMERCIAL..OFF
ELT ◁✻ (when conditions permit)........................ON
ENGs RELIGHT..TRY REGULARLY
USE RUDDER WITH CARE

- **If ditching anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.

- **If forced landing anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00017101.0002001 / 31 AUG 17

- **If engine relight cannot be attempted:**

L2 (It includes the cases of no fuel remaining or engine damage)

L1 OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Green Dot Speed*)

L2 *Green dot speed is the optimum speed to glide as far as possible, in the event of an all engines failure.*

L1 GLIDING DISTANCE: 3 NM / 1000 FT

AT GREEN DOT SPEED: 3 NM / 1000 FT (300 FT/NM) NO WIND			
Flight Level	*FL 200*	*FL 300*	*FL 400*
Distance (NM)	*60*	*90*	*120*

APU (below FL 250) .... START
WING ANTI ICE .... OFF
APU BLEED (below FL 200) .... ON

SPEED BRAKES AVAILABLE

L2 *Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.*

L1
- **When below 10 000 FT AGL:**

  CABIN AND COCKPIT .... PREPARE

L2
  - *Secure loose equipment*
  - *Prepare survival equipment*
  - *Fasten belts and shoulder harnesses.*

L1 RAM AIR .... ON

L2 *Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.*

L1 BARO REF (if avail) .... SET
COMMERCIAL .... OFF
ELT ⊲ (when conditions permit) .... ON

USE RUDDER WITH CARE

- **If ditching anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

- **If forced landing anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00020857.0006001 / 31 AUG 17

- **If ditching anticipated:**

  MIN RAT SPEED: 140 KT
  GPWS SYS....OFF
  GPWS TERR....OFF

  L2 *Set the SYS pb-sw and TERR pb-sw to off in order to avoid nuisance warnings.*

  L1
  - **At appropriate altitude (above 3 000 FT AGL), configure aircraft for ditching:**

    LAND RECOVERY....ON

    FOR LANDING : USE FLAP 2

    L2 *EMER GEN is lost at slat extension. The aircraft is supplied only by the batteries.*

    L1 KEEP LANDING GEAR UP
    VAPP....DETERMINE

Gross Weight	*120 t / 265 klb*	*140 t / 310 klb*	*160 t / 355 klb*	*180 t / 400 klb*	*200 t / 440 klb*	*220 t / 485 klb*	*240 t / 530 klb*
VAPP	*150 kt*	*150 kt*	*153 kt*	*160 kt*	*167 kt*	*173 kt*	*180 kt*

  - **At 2 000 ft AGL:**

    CABIN CREW....NOTIFY FOR DITCHING
    DITCHING pb....ON

    L2 *Ditch the aircraft parallel to the swell. If that causes a strong crosswind, ditch the aircraft into the wind.*

  L1
  - **At 500 ft AGL:**

    BRACE FOR IMPACT....ORDER

    TOUCH DOWN AT MIN V/S

    TARGET PITCH ATT 11 °

  - **At touchdown:**

    ALL ENG MASTERS....OFF
    APU MASTER SW....OFF

  - **After ditching:**

    ATC (VHF 1)....NOTIFY
    ALL FIRE pb (ENGs & APU)....PUSH
    ALL AGENT (ENGs & APU)....DISCH

    L2 *Engine agent 2 is not available.*

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

L1 EVACUATION.......................................INITIATE

L2 *Make a short and precise announcement to order the emergency evacuation.*
Press the EVAC COMMAND pb ◁ .

L1 ALL BATs.......................................OFF

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00020858.0006001 / 31 AUG 17

- **If forced landing anticipated:**

  DESCENT SLOPE (CONF 2, L/G DOWN): 1.7 NM / 1000 FT (600 FT/NM)

  MIN RAT SPEED: 140 KT

  GPWS SYS.......................................OFF
  GPWS TERR.......................................OFF

  L2 *Set the SYS pb-sw and TERR pb-sw to off in order to avoid nuisance warnings.*

  L1

  - **At appropriate altitude (above 3 000 FT AGL), configure aircraft for landing:**

    LAND RECOVERY.......................................ON

    FOR LANDING : USE FLAP 2

    L2 *EMER GEN is lost at slat extension. The aircraft is supplied only by the batteries.*

    L1 MAX SPEED for GRAVITY EXTENTION.......................................200 kt
    L/G GRVTY EXTN.......................................DOWN

    MAN PITCH TRIM NOT AVAIL

    L2 *Disregard the "USE MAN PITCH TRIM" message on the PFD, because the stabilizer is jammed, due to not sufficient hydraulic power.*

    L1 VAPP.......................................DETERMINE

    L2 *Adjust the speed to the VAPP indicated in the table below. However, to reach the landing field or runway, it is possible to increase the approach speed.*

    L1

Gross Weight	*120 t / 265 klb*	*140 t / 310 klb*	*160 t / 355 klb*	*180 t / 400 klb*	*200 t / 440 klb*	*220 t / 485 klb*	*240 t / 530 klb*
VAPP	*150 kt*	*150 kt*	*153 kt*	*160 kt*	*167 kt*	*173 kt*	*180 kt*

  - **When L/G downlocked:**

    L/G lever.......................................DOWN

    SPLRs.......................................ARM

    MAX BRK PR: 1 000 PSI

  - **At 2 000 ft AGL:**

    CABIN CREW.......................................NOTIFY FOR LANDING

  - **At 500 ft AGL:**

    BRACE FOR IMPACT.......................................ORDER

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

- **At touchdown:**

  ALL ENG MASTERS..........OFF
  APU MASTER SW..........OFF

  BRAKES ON ACCU ONLY

- **When aircraft stopped:**

  PARKING BRK..........ON
  ATC (VHF 1)..........NOTIFY
  ALL FIRE pb (ENGs & APU)..........PUSH
  ALL AGENT (ENGs & APU)..........DISCH

  L2 *Engine agent 2 is not available.*

  L1 ■ **If evacuation required:**

  EVACUATION..........INITIATE

  L2 *Make a short and precise announcement to order the emergency evacuation.*
  Press the EVAC COMMAND pb ⊲ .

  L1 ALL BATs..........OFF

  ■ **If evacuation not required:**

  CABIN CREW and PASSENGERS (PA)..........NOTIFY

[QRH] ALL ENG FAIL

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Ident.: PRO-ABN-ENG-AK-00017076.0001001 / 10 NOV 22

L2 The flight crew must apply this paper procedure when required by the ENG ALL ENGINES FAILURE ECAM alert.

During the application of the ALL ENGINES FAILURE paper procedure:
- If one or more engines relight, apply the corresponding ECAM procedure instead, or
- If none of the engines relights, continue to apply the ALL ENGINES FAILURE paper procedure. If there is sufficient time, clear both the ECAM alerts and the ECAM STATUS page.

The purpose of the ENG ALL ENGINES FAILURE ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator.

The ALL ENGINES FAILURE paper procedure includes a fuel quantity check to determine if either of the following applies:
- Engine relight can be attempted, or
- Engine relight cannot be attempted.

If engine relight can be attempted, the flight crew can attempt successive engine relights. First without the APU bleed (windmill start), then with the APU bleed, if available.
If engine relight cannot be attempted, the flight crew must apply the procedure for forced landing or ditching.

L1 First apply the following actions of the ENG ALL ENGINES FAILURE ECAM procedure (if not already applied):

LAND ASAP

RAT....................MAN ON
EMER ELEC PWR MAN ON pb....................PRESS
OPTIMUM RELIGHT SPEED....................300/0.82

L2

PITCH TARGET IN CASE OF SPEED INDICATION FAILURE

GROSS WEIGHT	***Pitch (°)***
At or below 150 000 kg / 330 000 lb	*-2.5*
170 000 kg / 374 000 lb	*-1.5*
190 000 kg / 418 000 lb	*-1.0*
210 000 kg / 462 000 lb	*-0.5*
230 000 kg / 506 000 lb	*0*
At or above 250 000 kg / 550 000 lb	*0.5*

L1 APU (below FL 250)....................START

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

THR LEVERS..IDLE

GLIDING DISTANCE: 2 NM / 1000 FT

L2

AT 300 KT: 2 NM / 1000 FT (500 FT/NM) NO WIND			
Flight Level	*FL 200*	*FL 300*	*FL 400*
Distance (NM)	*40*	*60*	*80*

L1 DIVERSION..INITIATE

L2 *Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.*

L1 Then, as long as none of the engines relights, apply the following paper procedure. If there is sufficient time, clear all ECAM alerts, and clear the ECAM STATUS page.

VHF1..USE
ATC..NOTIFY
CABIN CREW..NOTIFY
SIGNS..ON
CREW OXY MASK (FL > 100)..USE
FUEL QUANTITY..CHECK

Ident.: PRO-ABN-ENG-AK-00020850.0002001 / 17 MAR 17

- **If engine relight can be attempted:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight can be attempted.

- **If engine relight cannot be attempted:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If engine relight cannot be attempted.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00017100.0004001 / 31 AUG 17

- **If engine relight can be attempted:**
  ENG START sel....................IGN / START
  - **Approaching or below FL 300: Windmill Relight**
    ALL ENG MASTERS....................OFF 30 S THEN ON
    ENGs RELIGHT....................TRY REGULARLY
    L2 *Windmill relight attempts can be repeated until successful, or until the APU bleed is available.*
    L1 APU (below FL 250) ....START
    - **If APU available and windmill relight unsuccessful: Starter Assisted Relight below FL 200**
      ALL ENG MASTERS....................OFF
      OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Green Dot Speed*)
      L2 *Green dot speed is the optimum speed for starter-assisted relight with the APU bleed.*
      L1 WING ANTI ICE....................OFF
      APU BLEED....................ON
      ENG MASTER (one at a time)....................ON
      L2 *Between each attempt to relight the same engine, wait at least 30 s with the associated ENG MASTER lever set to OFF.*

L1 SPEED BRAKES AVAILABLE

L2 *Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.*

L1
- **When below 10 000 FT AGL:**
  CABIN AND COCKPIT....................PREPARE
  L2
  - *Secure loose equipment*
  - *Prepare survival equipment*
  - *Fasten belts and shoulder harnesses.*

  L1 RAM AIR....................ON
  L2 *Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.*
  L1 BARO REF (if avail)....................SET

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

COMMERCIAL..OFF
ELT ⊲✻ (when conditions permit)........................ON
ENGs RELIGHT..TRY REGULARLY
USE RUDDER WITH CARE

- **If ditching anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.

- **If forced landing anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00017101.0002001 / 31 AUG 17

- **If engine relight cannot be attempted:**

L2 (It includes the cases of no fuel remaining or engine damage)

L1 OPTIMUM SPEED: GREEN DOT (*Refer to QRH/OPS Green Dot Speed*)

L2 *Green dot speed is the optimum speed to glide as far as possible, in the event of an all engines failure.*

L1 GLIDING DISTANCE: 3 NM / 1000 FT

AT GREEN DOT SPEED: 3 NM / 1000 FT (300 FT/NM) NO WIND			
Flight Level	*FL 200*	*FL 300*	*FL 400*
Distance (NM)	*60*	*90*	*120*

APU (below FL 250) .... START
WING ANTI ICE .... OFF
APU BLEED (below FL 200) .... ON
SPEED BRAKES AVAILABLE

L2 *Speed brakes remain available. If necessary, extend the speed brakes to increase the descent rate.*

L1
- **When below 10 000 FT AGL:**

  CABIN AND COCKPIT .... PREPARE

L2
  - *Secure loose equipment*
  - *Prepare survival equipment*
  - *Fasten belts and shoulder harnesses.*

L1 RAM AIR .... ON

L2 *Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft and to provide fresh air to the cabin. There is fresh air ventilation in the cockpit and cabin only when the differential pressure is below 1 PSI.*

L1 BARO REF (if avail) .... SET
COMMERCIAL .... OFF
ELT ◁ (when conditions permit) .... ON
USE RUDDER WITH CARE

- **If ditching anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

- **If forced landing anticipated:**

  Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated.

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00020857.0006001 / 31 AUG 17

- **If ditching anticipated:**

MIN RAT SPEED: 140 KT
GPWS SYS..OFF
GPWS TERR..OFF

L2 *Set the SYS pb-sw and TERR pb-sw to off in order to avoid nuisance warnings.*

L1

- **At appropriate altitude (above 3 000 FT AGL), configure aircraft for ditching:**

LAND RECOVERY..ON

FOR LANDING : USE FLAP 2

L2 *EMER GEN is lost at slat extension. The aircraft is supplied only by the batteries.*

L1 KEEP LANDING GEAR UP
VAPP..DETERMINE

Gross Weight	*120 t / 265 klb*	*140 t / 310 klb*	*160 t / 355 klb*	*180 t / 400 klb*	*200 t / 440 klb*	*220 t / 485 klb*	*240 t / 530 klb*
VAPP	*150 kt*	*150 kt*	*153 kt*	*160 kt*	*167 kt*	*173 kt*	*180 kt*

- **At 2 000 ft AGL:**

CABIN CREW..NOTIFY FOR DITCHING
DITCHING pb..ON

L2 *Ditch the aircraft parallel to the swell. If that causes a strong crosswind, ditch the aircraft into the wind.*

L1

- **At 500 ft AGL:**

BRACE FOR IMPACT..ORDER

TOUCH DOWN AT MIN V/S

TARGET PITCH ATT 11 °

- **At touchdown:**

ALL ENG MASTERS..OFF
APU MASTER SW..OFF

- **After ditching:**

ATC (VHF 1)..NOTIFY
ALL FIRE pb (ENGs & APU)..PUSH
ALL AGENT (ENGs & APU)..DISCH

L2 *Engine agent 2 is not available.*

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

L1 EVACUATION...INITIATE

L2 *Make a short and precise announcement to order the emergency evacuation.*
Press the EVAC COMMAND pb .

L1 ALL BATs..OFF

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

Ident.: PRO-ABN-ENG-AK-00020858.0006001 / 31 AUG 17

- **If forced landing anticipated:**

  DESCENT SLOPE (CONF 2, L/G DOWN): 1.7 NM / 1000 FT (600 FT/NM)

  MIN RAT SPEED: 140 KT

  GPWS SYS...OFF
  GPWS TERR...OFF

  L2 *Set the SYS pb-sw and TERR pb-sw to off in order to avoid nuisance warnings.*

  L1
  - **At appropriate altitude (above 3 000 FT AGL), configure aircraft for landing:**

    LAND RECOVERY...ON

    FOR LANDING : USE FLAP 2

    L2 *EMER GEN is lost at slat extension. The aircraft is supplied only by the batteries.*

    L1 MAX SPEED for GRAVITY EXTENTION...200 kt
    L/G GRVTY EXTN...DOWN

    MAN PITCH TRIM NOT AVAIL

    L2 *Disregard the "USE MAN PITCH TRIM" message on the PFD, because the stabilizer is jammed, due to not sufficient hydraulic power.*

    L1 VAPP...DETERMINE

    L2 *Adjust the speed to the VAPP indicated in the table below. However, to reach the landing field or runway, it is possible to increase the approach speed.*

L1

Gross Weight	*120 t / 265 klb*	*140 t / 310 klb*	*160 t / 355 klb*	*180 t / 400 klb*	*200 t / 440 klb*	*220 t / 485 klb*	*240 t / 530 klb*
VAPP	*150 kt*	*150 kt*	*153 kt*	*160 kt*	*167 kt*	*173 kt*	*180 kt*

  - **When L/G downlocked:**

    L/G lever...DOWN

    SPLRs...ARM

    MAX BRK PR: 1 000 PSI

  - **At 2 000 ft AGL:**

    CABIN CREW...NOTIFY FOR LANDING

  - **At 500 ft AGL:**

    BRACE FOR IMPACT...ORDER

Continued on the following page

[QRH] ALL ENG FAIL (Cont'd)

- **At touchdown:**
  ALL ENG MASTERS....................OFF
  APU MASTER SW....................OFF
  BRAKES ON ACCU ONLY

- **When aircraft stopped:**
  PARKING BRK....................ON
  ATC (VHF 1)....................NOTIFY
  ALL FIRE pb (ENGs & APU)....................PUSH
  ALL AGENT (ENGs & APU)....................DISCH
  L2 *Engine agent 2 is not available.*

  L1 ■ **If evacuation required:**
    EVACUATION....................INITIATE
    L2 *Make a short and precise announcement to order the emergency evacuation.*
    Press the EVAC COMMAND pb .
    L1 ALL BATs....................OFF

  ■ **If evacuation not required:**
    CABIN CREW and PASSENGERS (PA)....................NOTIFY

[QRH] ENGINE FUEL SYSTEM CONTAMINATION

Ident.: PRO-ABN-ENG-00013976.0006001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

This procedure must be applied if one of the two following conditions is encountered. In that case, a fuel contamination can be highly suspected.

- **If ENG 1(2) CTL SYS FAULT alert triggered associated with AVOID RAPID THR CHANGES or ENG 1(2) AT IDLE, and with rapid and continuous N1 fluctuation indications on both engines:**
  A/THR.......OFF
  - **If N1 fluctuations stop on both engines:**
    ECAM PROC.......APPLY
    A/THR.......KEEP OFF
  - **If N1 fluctuations continue on both engines:**

    FUEL CONTAMINATION CONFIRMED

    Apply condition: If fuel contamination confirmed
- **If ENG 1 CTL SYS FAULT and ENG 2 CTL SYS FAULT alerts triggered with AVOID RAPID THR CHANGES or ENG 1(2) AT IDLE:**
  A/THR.......OFF

  FUEL CONTAMINATION CONFIRMED

  Apply condition: If fuel contamination confirmed

This procedure must be applied if a fuel contamination has been confirmed. This fuel contamination may result, in the worst case, in a loss of engine thrust control. This procedure aims at maintaining the thrust on one engine while minimizing the thrust changes on the other, in order to prevent contaminant from blocking the mechanical devices of engine thrust regulation.

In case of ENG 1(2) CTL SYS FAULT on only one engine:
- Set and maintain the thrust on the engine affected by the ECAM caution
- Minimize the thrust changes on the engine not affected by the ECAM caution

In case of ENG 1 and 2 CTL SYS FAULT (both engines affected by the ECAM caution):
- Set and maintain the thrust on the first engine affected by the ECAM caution
- Minimize the thrust changes on the second engine affected by the ECAM caution

● **If fuel contamination confirmed:**

LAND ASAP

A/THR.......KEEP OFF

Continued on the following page

[QRH] ENGINE FUEL SYSTEM CONTAMINATION (Cont'd)

MAN THR (1st affected engine)..SET and MAINTAIN

MAINTAIN THRUST UNTIL FINAL APPROACH

THRUST SETTING (N1)													
	GROSS WEIGHT *(1 000 kg)*												
	120	***130***	***140***	***150***	***160***	***170***	***180***	***190***	***200***	***210***	***220***	***230***	***240***
N1(%)	*71.4*	*72.1*	*72.9*	*73.7*	*74.5*	*75.5*	*76.5*	*77.5*	*78.5*	*79.6*	*80.8*	*81.8*	*83.0*

- **In cruise:**

  MAN THR (other engine)..SET AS RQRD

  MINIMIZE THRUST CHANGES

- **For descent:**

  MAN THR (other engine).. IDLE

  SPD BRK... AS RQRD

  Level-off at approximately 3 000 ft AGL and 20 NM from the runway threshold.

- **For landing:** RESUME NORMAL SOP

  Resume normal operations: Retard thrust levers as usual, select reverse thrust and apply brakes as required.

  USE FLAP FULL

  When fully configured:

  - *In case of overspeed adjust the thrust on the 1st affected engine*
  - *If the speed trend decreases below VAPP, adjust the thrust on the other engine.*

[QRH] ENGINE FUEL SYSTEM CONTAMINATION

Ident.: PRO-ABN-ENG-00013976.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

This procedure must be applied if one of the two following conditions is encountered. In that case, a fuel contamination can be highly suspected.

- **If ENG 1(2) CTL SYS FAULT alert triggered associated with AVOID RAPID THR CHANGES or ENG 1(2) SLOW RESPONSE, and with rapid and continuous EPR fluctuation indications on both engines:**
  A/THR.......................................OFF
  - **If EPR fluctuations stop on both engines:**
    ECAM PROC.......................................APPLY
    A/THR.......................................KEEP OFF
  - **If EPR fluctuations continue on both engines:**

    FUEL CONTAMINATION CONFIRMED

    Apply condition: If fuel contamination confirmed
- **If ENG 1 CTL SYS FAULT and ENG 2 CTL SYS FAULT alerts triggered with AVOID RAPID THR CHANGES or ENG 1(2) SLOW RESPONSE:**
  A/THR.......................................OFF

  FUEL CONTAMINATION CONFIRMED

  Apply condition: If fuel contamination confirmed

This procedure must be applied if a fuel contamination has been confirmed. This fuel contamination may result, in the worst case, in a loss of engine thrust control. This procedure aims at maintaining the thrust on one engine while minimizing the thrust changes on the other, in order to prevent contaminant from blocking the mechanical devices of engine thrust regulation.

In case of ENG 1(2) CTL SYS FAULT on only one engine:
- Set and maintain the thrust on the engine affected by the ECAM caution
- Minimize the thrust changes on the engine not affected by the ECAM caution

In case of ENG 1 and 2 CTL SYS FAULT (both engines affected by the ECAM caution):
- Set and maintain the thrust on the first engine affected by the ECAM caution
- Minimize the thrust changes on the second engine affected by the ECAM caution

● **If fuel contamination confirmed:**

LAND ASAP

A/THR.......................................KEEP OFF

Continued on the following page

[QRH] ENGINE FUEL SYSTEM CONTAMINATION (Cont'd)

MAN THR (1st affected engine)..........SET and MAINTAIN

MAINTAIN THRUST UNTIL FINAL APPROACH

THRUST SETTING (N1)													
	GROSS WEIGHT *(1 000 kg)*												
	120	***130***	***140***	***150***	***160***	***170***	***180***	***190***	***200***	***210***	***220***	***230***	***240***
N1(%)	*58.1*	*58.7*	*59.4*	*60.1*	*60.8*	*61.6*	*62.5*	*63.3*	*64.1*	*65.0*	*65.9*	*66.8*	*67.7*

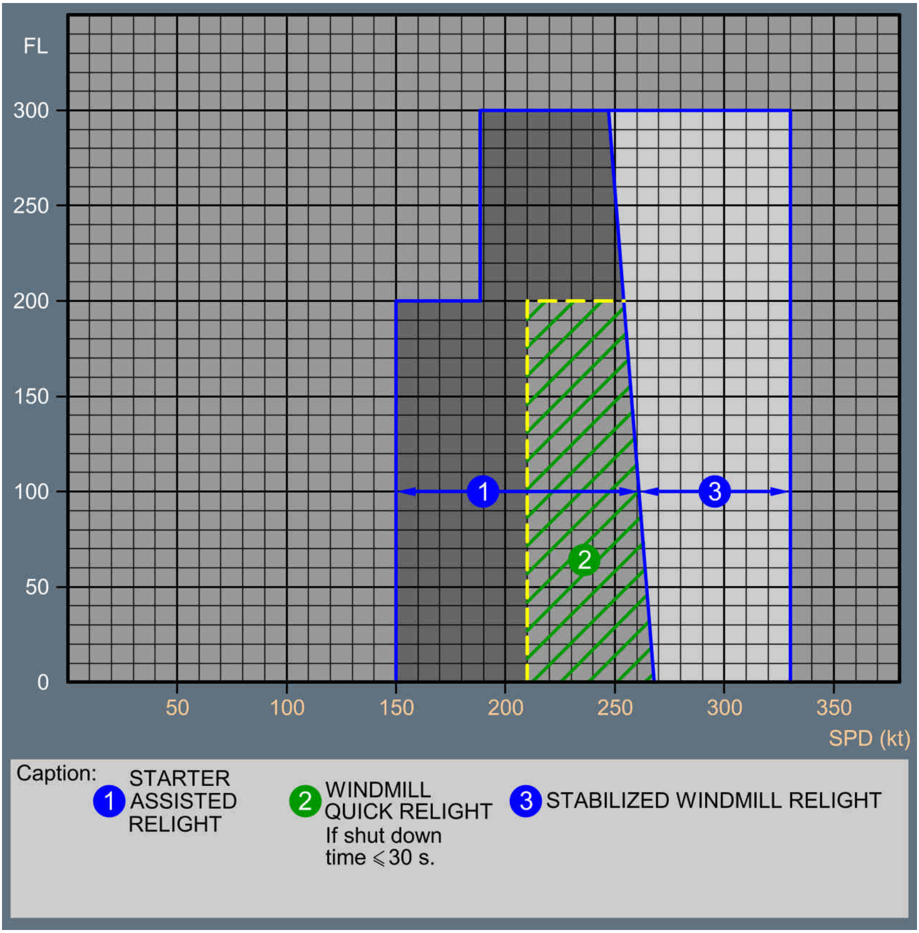
- **In cruise:**
  MAN THR (other engine)..........SET AS RQRD
  MINIMIZE THRUST CHANGES
- **For descent:**
  MAN THR (other engine)..........IDLE
  SPD BRK..........AS RQRD
  Level-off at approximately 3 000 ft AGL and 20 NM from the runway threshold.
- **For landing:** RESUME NORMAL SOP
  Resume normal operations: Retard thrust levers as usual, select reverse thrust and apply brakes as required.
  USE FLAP FULL

  When fully configured:
  - *In case of overspeed adjust the thrust on the 1st affected engine*
  - *If the speed trend decreases below VAPP, adjust the thrust on the other engine.*

[QRH] ENG RELIGHT
IN FLIGHT

Ident.: PRO-ABN-ENG-00011616.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

Engine Relight Envelope



MAX GUARANTEED ALTITUDE : 30 000 ft

Continued on the following page

[QRH] ENG RELIGHT (Cont'd)
IN FLIGHT

ENG MASTER (affected engine)........................OFF
THR LEVER (affected engine)........................IDLE
ENG START sel........................IGN / START
X BLEED........................OPEN

If outside windmilling start envelope, FADEC opens starter valve.

WING ANTI ICE (for starter assisted start)........................OFF
ENG MASTER........................ON
ENG PARAMETERS (N3, EGT)........................MONITOR

Engine light up should be achieved within 30 s after fuel flow increases.

- *Monitor N3*
- *If uncertain about successful relight, move the thrust lever forward and check engine response.*

■ **When idle reached (ENG AVAIL):**

ENG START sel........................NORM
TCAS MODE sel........................TA/RA

Check that the selector is at TA/RA since if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at TA position.

X BLEED........................AUTO
Affected SYS........................RESTORE

■ **If no relight:**

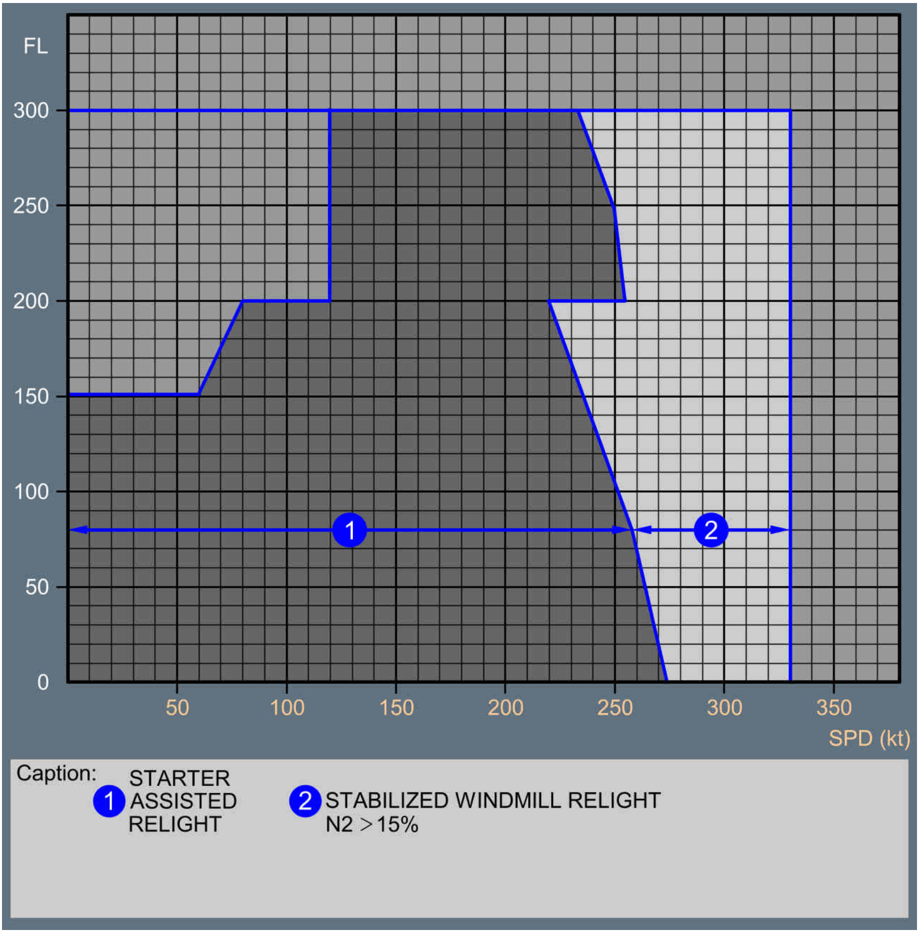
ENG MASTER (affected engine)........................OFF

Wait 30 s before new start attempt (to drain the engine).

[QRH] ENG RELIGHT
IN FLIGHT

Ident.: PRO-ABN-ENG-00011616.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Engine Relight Envelope



MAX GUARANTEED ALTITUDE : 30 000 ft

Continued on the following page

[QRH] ENG RELIGHT (Cont'd)
IN FLIGHT

ENG MASTER (affected engine)........OFF
THR LEVER (affected engine)........IDLE
ENG START sel........IGN / START
X BLEED........OPEN

If outside windmilling start envelope, FADEC opens starter valve.

WING ANTI ICE (for starter assist)........OFF
ENG MASTER........ON
ENG PARAMETERS (N2, EGT)........MONITOR

Engine light up should be achieved within 30 s after fuel flow increases.

- *Monitor N2*
- *If uncertain about successful relight, move the thrust lever forward and check engine response.*

■ **When idle reached (ENG AVAIL):**

ENG START sel........NORM
TCAS MODE sel........TA/RA

Check that the selector is at TA/RA since if the ENG SHUT DOWN procedure has been applied, the TCAS mode selector may have been set at TA position.

X BLEED........AUTO
Affected SYS........RESTORE

■ **If no relight:**

ENG MASTER (affected engine)........OFF

Wait 30 s before new start attempt (to drain the engine).

[QRH] ENG STALL

Ident.: PRO-ABN-ENG-00018671.0001001 / 12 MAY 23
Applicable to: ALL

THR LEVER (affected engine)..IDLE
ENG PARAMETERS (affected engine)..CHECK

- **If abnormal ENG parameters:**

  ENG MASTER (affected engine)..OFF

  ENG 1(2) SHUT DOWN

  Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN.
  Engine restart at crew discretion.

- **If normal ENG parameters:**

  ENG ANTI-ICE (affected engine)..ON
  WING ANTI-ICE..ON

  Operation of the engine and wing anti-ice will increase the stall margin but EGT will increase accordingly.

  THR LEVER (affected engine)..SLOWLY MOVE FORWARD

  - **If stall does not recur:**

    CONTINUE NORMAL ENG OPERATION

[QRH] ENGINE TAILPIPE FIRE

Ident.: PRO-ABN-ENG-00011797.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Internal engine fire may be encountered during engine start or engine shutdown.
It may be seen by the ground crew, or the EGT may fail to decrease after the ENG MASTER lever is turned off.

CAUTION	External fire agents can cause severe corrosive damage. Consider the use of external fire agents only if the following procedure does not stop engine tailpipe fire.

ENG MASTER (affected engine)...OFF

Note: Do not press the ENG FIRE pb-sw, since this would cut off the FADEC power supply, which would prevent motoring sequence.

ESTABLISH AIR BLEED PRESS

Select the APU, or opposite ENG BLEED, to motor the engine.
If APU BLEED is not available, and the other engine is shut down, connect external pneumatic power (if readily available).

BEACON...ON

- **When N2 < 30 %:**
  ENG START sel...CRANK
  ENG MAN START pb (affected engine)...ON
  The start valve automatically reopens, when N2 is below 15 %.
- **When fire stopped:**
  ENG MAN START pb (affected engine)...OFF
  ENG START sel...NORM
  Maintenance action is due.

[QRH] ENGINE TAILPIPE FIRE

Ident.: PRO-ABN-ENG-00011797.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

Internal engine fire may be encountered during engine start or engine shutdown.
It may be seen by the ground crew, or the EGT may fail to decrease after the ENG MASTER lever is turned off.

CAUTION	External fire agents can cause severe corrosive damage. Consider the use of external fire agents only if the following procedure does not stop engine tailpipe fire.

ENG MASTER (affected engine)..OFF

Note: *Do not press the ENG FIRE pb-sw, since this would cut off the FADEC power supply, which would prevent motoring sequence.*

ESTABLISH AIR BLEED PRESS

Select the APU, or opposite ENG BLEED, to motor the engine.
If APU BLEED is not available, and the other engine is shut down, connect external pneumatic power (if readily available).

BEACON..ON

- **When N3 < 30 %:**
  ENG START sel..CRANK
  ENG MAN START pb (affected engine)..ON
  The start valve automatically reopens, when N3 is below 10 %.
- **When fire stopped:**
  ENG MAN START pb (affected engine)..OFF
  ENG START sel..NORM
  Maintenance action is due.

[QRH] HIGH ENGINE VIBRATION

Ident.: PRO-ABN-ENG-00011798.0003001 / 28 SEP 17
Applicable to: LV-KHT, LV-KHU

The vibration advisory on ECAM (N1 greater than 3.3 units, N2 greater than 2.6 units, N3 greater than 4.0 units) is mainly a guideline for the flight crew to monitor engine parameters more closely. The ECAM vibration advisory alone does not require engine shut down.

Note: *1. High engine vibration may be accompanied by cockpit and cabin smoke and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.*
2. High N1 vibration are generally accompanied by perceivable airframe vibrations. High N2, N3 vibration can occur without perceivable airframe vibrations.

ENG PARAMETERS..CHECK

Check engine parameters and especially EGT; crosscheck with other engine. Report in maintenance logbook.

■ **If icing suspected:**

An increase of N1 vibration in icing conditions with or without engine anti-ice may be due to fan blades and/or spinner icing. Icing may be suspected if N1 vibration occurs without other engine parameters variation.

A/THR..OFF
THRUST (one engine at a time)....................IDLE THEN INCREASE N1 > 80 %

Reduce thrust to idle if flight conditions permit.
If ENG ANTI ICE is off, switch it ON ***at idle fan speed,*** *one engine after the other with approximately 30 s interval.*
To shed ice, it may be necessary to perform several thrust variations between idle and a thrust compatible with the flight phase. For efficient ice shedding, thrust should be increased to at least 80% N1 if flight conditions permit.
After each thrust variation, vibrations should decrease, indicating the progress of the ice shedding.
When the ice is shed, vibrations should return to normal and the flight crew can resume normal engine operation.

■ **If icing not suspected:**

● **If above vibration advisory and flight conditions permit:**
THRUST (affected engine)..............REDUCE BELOW ADVISORY THRESHOLD

Continued on the following page

[QRH] HIGH ENGINE VIBRATION (Cont'd)

If flight conditions permit, reduce thrust to maintain vibration level below the advisory threshold. If the VIB indication does not decrease following thrust reduction, this may indicate other problems on the engine.

- **After landing, if vibrations continue :** SHUT DOWN ENGINE WHEN POSSIBLE

[QRH] HIGH ENGINE VIBRATION

Ident.: PRO-ABN-ENG-00011798.0005001 / 28 SEP 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The vibration advisory on ECAM (N1 greater than 5.7 units, N2 greater than 5.6 units) is mainly a guideline for the flight crew to monitor engine parameters more closely.
The ECAM vibration advisory alone does not require engine shut down.

Note: 1. *High engine vibration may be accompanied by cockpit and cabin smoke and/or the smell of burning. This may be due only to compressor blade tip contact with associated abradable seals.*
2. *High N1 vibration are generally accompanied by perceivable airframe vibrations. High N2 vibration can occur without perceivable airframe vibrations.*
3. *High N2 vibrations may be experienced during the descent. It should decrease below advisory level within approximately 2 minutes without necessitating crew action as long as other engine parameters are normal. Report to maintenance.*

ENG PARAMETERS..CHECK

Check engine parameters and especially EGT; crosscheck with other engine. Report in maintenance logbook.

- **If icing suspected:**

  An increase of N1 vibration in icing conditions with or without engine anti-ice may be due to fan blades and/or spinner icing. Icing may be suspected if N1 vibration occurs without other engine parameters variation.

  A/THR..OFF
  THRUST (one engine at a time)........................ IDLE THEN INCREASE N1 > 80 %

  Reduce thrust to idle if flight conditions permit.
  If ENG ANTI ICE is off, switch it ON ***at idle fan speed,*** *one engine after the other with approximately 30 s interval.*
  To shed ice, it may be necessary to perform several thrust variations between idle and a thrust compatible with the flight phase. For efficient ice shedding, thrust should be increased to at least 80% N1 if flight conditions permit.
  After each thrust variation, vibrations should decrease, indicating the progress of the ice shedding.
  When the ice is shed, vibrations should return to normal and the flight crew can resume normal engine operation.

Continued on the following page

[QRH] HIGH ENGINE VIBRATION (Cont'd)

■ **If icing not suspected:**

- **If above vibration advisory and flight conditions permit:**
  THRUST (affected engine)............................REDUCE BELOW ADVISORY THRESHOLD
  If flight conditions permit, reduce thrust to maintain vibration level below the advisory threshold. If the VIB indication does not decrease following thrust reduction, this may indicate other problems on the engine.

- **After landing, if vibrations continue :** SHUT DOWN ENGINE WHEN POSSIBLE

[QRH] ON GROUND - NON ENG SHUTDOWN AFTER ENG MASTER OFF

Ident.: PRO-ABN-ENG-00020610.0001001 / 28 MAY 20
Applicable to: ALL

The normal procedure to shut down an engine is to set the ENG MASTER lever to OFF. In the case where the engine does not shut down as expected, use the following procedure:

ECAM FUEL PAGE...SELECT
LP FUEL VALVE POSITION (affected engine)..CHECK

■ **If LP fuel valve closed (cross line amber):**

NO CREW ACTION

■ **If LP fuel valve open:**

ENG FIRE pb-sw (affected engine)...PRESS
Using the engine fire pushbutton will force the LP fuel valve to close. The engine will shut down after a time delay.

GROUND CREW..NOTIFY

IN BOTH CASES, ENGINE WILL SHUT DOWN AFTER A TIME DELAY UP TO 1 MIN 30 S
The engine shuts down when the remaining fuel between the LP *fuel valve and the nozzles is burned. The time delay for engine shutdown depends on airport altitude and fuel recirculation system operation.*

[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH

Ident.: PRO-ABN-ENG-00010065.0014001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 WITH GEAR DOWN (1000 kg)								
OAT (°C)	**AIRPORT ELEVATION (feet)**							
	0	**2 000**	**4 000**	**6 000**	**8 000**	**10 000**	**12 000**	**14 000**
0	224	216	206	198	188	180	172	158
5	224	214	206	196	188	180	158	154
10	224	214	206	196	186	174	158	148
15	222	214	206	194	180	158	154	142
20	222	214	202	186	174	158	148	138
25	222	208	194	180	158	154	144	132
30	214	200	188	174	158	150	138	
35	208	194	182	168	156	144		
40	198	186	176	158				
45	190	180	168					
50	182	172						
55	176							

● **If aircraft weight above maximum weight for circling in CONF 3 with gear down:**

DELAY GEAR EXTENSION TO MAINTAIN LEVEL FLIGHT

The aircraft cannot maintain level flight, in CONF 3 and with the landing gear down.

Note:
- *If circling below 750 ft RA, “L/G GEAR NOT DOWN” alert will trigger. The pilot can cancel the aural warning by pressing the EMER CANC pb.*
- *If the landing gear is not downlocked at 500 ft RA, GPWS ”TOO LOW GEAR” aural alert will trigger.*

[QRH] ONE ENGINE INOPERATIVE - CIRCLING APPROACH

Ident.: PRO-ABN-ENG-00010065.0017001 / 20 MAR 17

Applicable to: LV-KHT, LV-KHU

MAXIMUM WEIGHT FOR CIRCLING IN CONF 3 WITH GEAR DOWN (1000 kg)								
OAT (°C)	**AIRPORT ELEVATION (feet)**							
	0	**2 000**	**4 000**	**6 000**	**8 000**	**10 000**	**12 000**	**14 000**
0	232	224	214	208	200	192	182	170
5	232	224	214	208	200	192	178	158
10	232	224	214	208	200	186	172	158
15	232	224	214	208	194	180	168	156
20	232	224	214	202	188	174	158	150
25	232	224	210	196	182	168	156	146
30	232	218	202	188	174	158	150	
35	224	208	194	180	168	156		
40	216	200	186	174				
45	206	192	178					
50	198	184						
55	190							

- **If aircraft weight above the maximum weight for circling in CONF 3 with gear down:**

  DELAY GEAR EXTENSION TO MAINTAIN LEVEL FLIGHT

  The aircraft cannot maintain level flight, in CONF 3 and with the landing gear down.

  Note: - *If circling below 750 ft RA, "L/G GEAR NOT DOWN" alert will trigger. The pilot can cancel the aural warning by pressing the EMER CANC pb.*

  - *If the landing gear is not downlocked at 500 ft RA, GPWS "TOO LOW GEAR" aural alert will trigger.*

ENG 1(2) AIR EXCHANGER FAULT

Applicable to: LV-KHT, LV-KHU

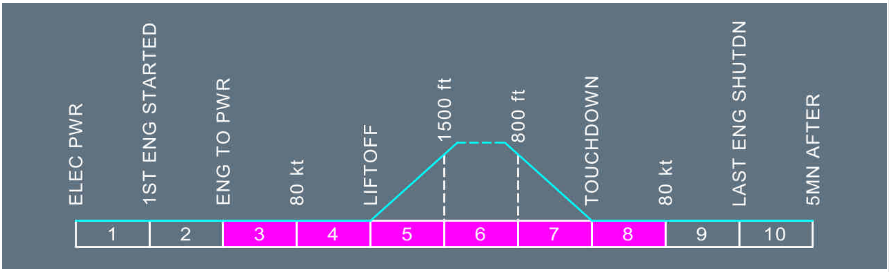
Ident.: PRO-ABN-ENG-AL-00018288.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil temperature control system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
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Ident.: PRO-ABN-ENG-AL-00018537.0004001 / 21 MAR 16

Crew awareness.

ENG 1(2) BLEED STATUS FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

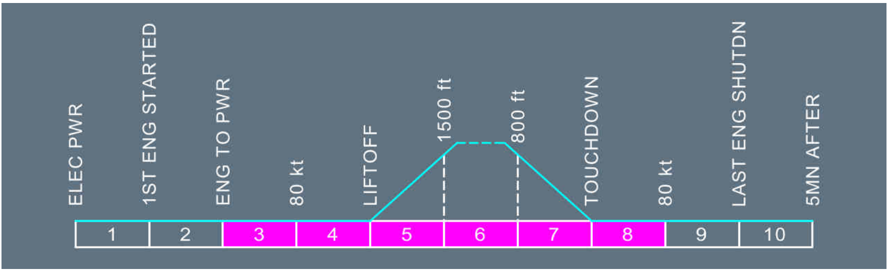
Ident.: PRO-ABN-ENG-H-00018289.0002001 / 28 MAY 18

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when either bleed valves, pack valves, wing and engine anti-ice valves or crossbleed valve position status is not received by the active FADEC channel.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ENG-H-00018648.0006001 / 04 DEC 18

ENG (affected) HI IDLE

L2 *FADEC increases minimum idle on the affected engine, as if bleed and pack valves were open.*

L1
- **On ground:**
  - **BEFORE T.O:**

    PACK 1+2....OFF
    ENG (affected) ANTI ICE....ON
    WING ANTI ICE....ON

  BOTH PACKS AVAIL IN FLT

Continued on the following page

ENG 1(2) BLEED STATUS FAULT (Cont'd)

Ident.: PRO-ABN-ENG-H-00011648.0001001 / 18 AUG 10

STATUS

BOTH PACKS AVAIL IN FLT (displayed on ground)
ENG (affected) HI IDLE

ENG 1(2) BLEED STATUS FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

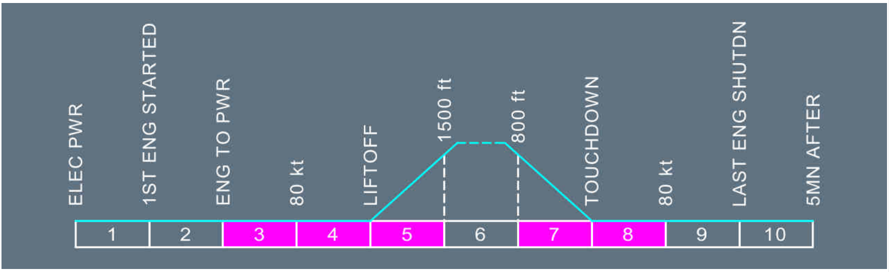
Ident.: PRO-ABN-ENG-H-00018289.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when either bleed valves, pack valves, wing and engine anti-ice valves or crossbleed valve position status is not received by the active FADEC channel.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) BLEED STATUS FAULT (Cont'd)

Ident.: PRO-ABN-ENG-H-00018648.0004001 / 21 MAR 16

HI IDLE (FADEC INCREASES MINIMUM IDLE ON THE RELATED ENGINE)

L2 *FADEC increases minimum idle on the related engine, as if bleed and pack valves were open.*

L1
- **BEFORE T.O:**
  PACK 1+2....................OFF
  ENG (AFFECTED) ANTI ICE....................ON
  WING ANTI ICE....................ON
- **On ground:**
  BOTH PACKS AVAIL IN FLT

Ident.: PRO-ABN-ENG-H-00011648.0001001 / 18 AUG 10

STATUS

BOTH PACKS AVAIL IN FLT (displayed on ground)
ENG (affected) HI IDLE

ENG 1(2) COOL VALVE FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

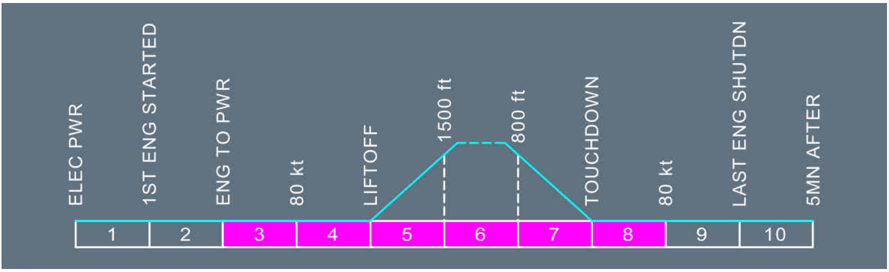
Ident.: PRO-ABN-ENG-AM-00018291.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the IDG valve is closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ENG-AM-00018649.0001001 / 21 MAR 16

- **If IDG valve failed closed (open):**
  IDG VALVE CLOSED (OPEN)
- **If core valve failed closed:**
  CORE VALVE CLOSED

ENG 1(2) CTL SYS FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Ident.: PRO-ABN-ENG-G-00018292.0004001 / 26 NOV 19

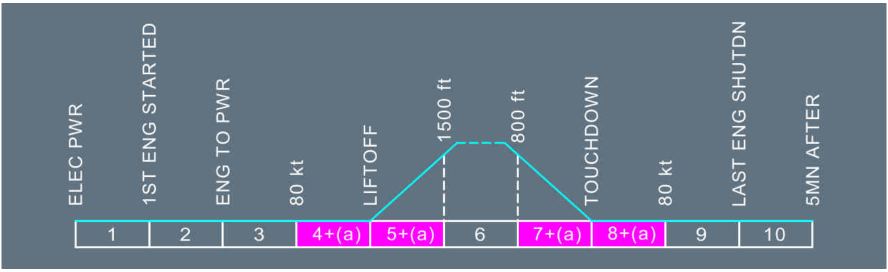
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Variable Bleed Valve (VBV) or Variable Stator Vane (VSV) is failed, or
- Parameters (PS 3, T25, T3, N1, N2) are lost, or
- Fuel Meter Valve (FMV) or VSV position is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7+(a)
8+(a)
9
10

Note: *(a) - In case of failure requiring to avoid rapid thrust changes.*

Ident.: PRO-ABN-ENG-G-00018547.0004001 / 21 MAR 16

- **On ground:**
  THR LEVER 1(2).. IDLE
  ENG MASTER 1(2)..OFF
- **In flight:**
  - **In case of VBV or VSV failures:**
    AVOID RAPID THR CHANGES
  - **In case of a FMV failure:**
    ENG 1(2) AT IDLE

Continued on the following page

ENG 1(2) CTL SYS FAULT (Cont'd)

Ident.: PRO-ABN-ENG-G-00018548.0004001 / 12 JUL 18

STATUS

- **In case of VBV or VSV failures:**
  AVOID RAPID THR CHANGES
- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY
- **In case of FMV failure:**
  ENG 1(2) AT IDLE

INOP SYS

GA SOFT ◁

ENG 1(2) CTL SYS FAULT

Applicable to: LV-KHT, LV-KHU

Ident.: PRO-ABN-ENG-G-00018292.0004001 / 26 NOV 19

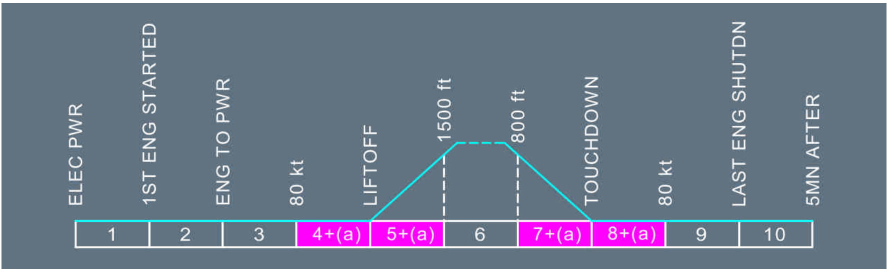
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Variable Bleed Valve (VBV) or Variable Stator Vane (VSV) is failed, or
- Parameters (PS 3, T25, T3, N1, N2) are lost, or
- Fuel Meter Valve (FMV) or VSV position is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
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4+(a)
5+(a)
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7+(a)
8+(a)
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Note: (a) - In case of failure requiring to avoid rapid thrust changes.

Continued on the following page

ENG 1(2) CTL SYS FAULT (Cont'd)

Ident.: PRO-ABN-ENG-G-00018547.0002001 / 21 MAR 16

- **On ground:**
  THR LEVER 1(2).. IDLE
  ENG MASTER 1(2)...OFF
- **In flight:**
  - **In case of a P30 failure:**
    AVOID RAPID THR CHANGES
  - **In case of an FMV or FSV position failure:**
    ENG 1(2) SLOW RESPONSE.
  - **In case of an N1, N2 SENSOR failure:**
    ENG 1(2) AT IDLE
  - **In case of a BLEED VALVE failure:**
    THR LEVER 1(2)...IDLE

Ident.: PRO-ABN-ENG-G-00018548.0003001 / 21 MAR 16

STATUS

- **IN CASE OF P 30 failure:**
  AVOID RAPID THR CHANGES
- **IN CASE OF FMV or FSV position failure:**
  ENG 1(2) SLOW RESPONSE
- **IN CASE OF N1, N2 SENSOR failure:**
  ENG 1(2) AT IDLE

ENG 1(2) EGT EXCEEDED

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

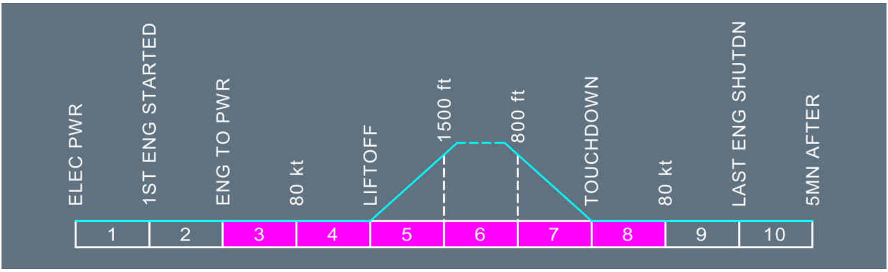
Ident.: PRO-ABN-ENG-AO-00018297.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when EGT limit is exceeded during an air start of the previous flight.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-AO-00018942.0001001 / 21 MAR 16

DURING AIR START.

Crew awareness.

ENG 1(2) EGT OVERLIMIT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Ident.: PRO-ABN-ENG-AP-00018298.0001001 / 21 MAR 16

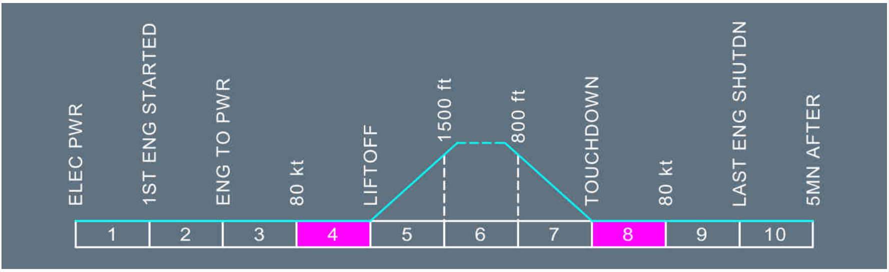
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- EGT is above 940 °C, or
- EGT is above 975 °C at takeoff power.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EGT OVERLIMIT (Cont'd)

Ident.: PRO-ABN-ENG-AP-00018553.0001001 / 04 DEC 17

- **Maximum pointer indications:**

  THR LEVER (AFFECTED ENGINE).. BELOW LIMIT

L2 *Normal operation may be resumed.*
Report in maintenance logbook.

L1
- **For aircraft equipped with PW engines:**

  Shut down affected engine if unable to maintain EGT within limits. If conditions do not permit engine shutdown, land as soon as possible using the minimum thrust required to sustain safe flight.

- **For aircraft equipped with GE or RR engines:**
  - **If THR LEVER at idle for more than 5 s:**

    ENG MASTER (AFFECTED ENGINE)... OFF

L2 *If conditions do not permit engine shut down, land as soon as possible using the minimum thrust required to sustain safe flight.*

L1

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN

For aircraft equipped with GE or RR engines.

ENG 1(2) EGT OVERLIMIT

Applicable to: LV-KHT, LV-KHU

Ident.: PRO-ABN-ENG-AP-00018298.0003001 / 21 MAR 16

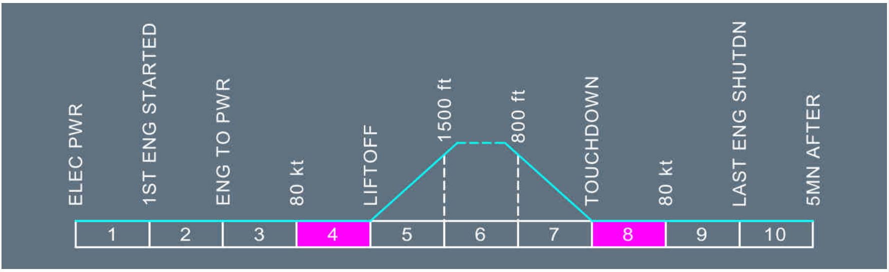
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- EGT is above 920 °C, or
- EGT is above 900 °C for more than 20 s, or
- EGT is above 850 °C when the throttle resolver angle is lower than MCT.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EGT OVERLIMIT (Cont'd)

Ident.: PRO-ABN-ENG-AP-00018553.0001001 / 04 DEC 17

- **Maximum pointer indications:**

  THR LEVER (AFFECTED ENGINE).. BELOW LIMIT

  L2 *Normal operation may be resumed.*
  Report in maintenance logbook.

- L1 **For aircraft equipped with PW engines:**

  Shut down affected engine if unable to maintain EGT within limits. If conditions do not permit engine shutdown, land as soon as possible using the minimum thrust required to sustain safe flight.

- **For aircraft equipped with GE or RR engines:**
  - **If THR LEVER at idle for more than 5 s:**

    ENG MASTER (AFFECTED ENGINE).. OFF

    L2 *If conditions do not permit engine shut down, land as soon as possible using the minimum thrust required to sustain safe flight.*

L1

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN

For aircraft equipped with GE or RR engines.

ENG ALL ENGINES FAILURE

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

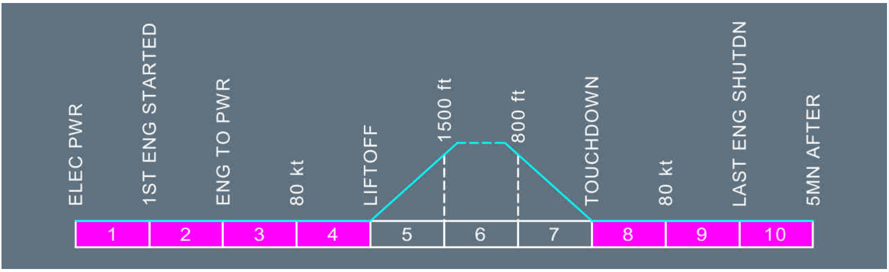
Ident.: PRO-ABN-ENG-DM-00018372.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers in the case of all engines failure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG ALL ENGINES FAILURE (Cont'd)

Ident.: PRO-ABN-ENG-DM-00017079.0015001 / 04 SEP 17

L2 The ENG ALL ENGINES FAILURE ECAM alert inhibits the ELEC EMER CONFIG ECAM alert, and provides the flight crew with an associated procedure to immediately apply in the case of a failure of all engines. The purpose of the ENG ALL ENGINES FAILURE ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator. Then, the ENG ALL ENGINES FAILURE ECAM procedure specifies that the flight crew must apply the ALL ENGINES FAILURE QRH procedure.

L1 **LAND ASAP**

RAT.. MAN ON
EMER ELEC PWR (IF NOT AUTOMATICALLY COUPLED).................. MAN ON
OPT RELIGHT SPD.. 270/0.82

L2 *In the case of a speed indication failure due to volcanic ash, the pitch altitude for optimum relight is provided in the QRH procedure.*

L1 APU (BELOW FL 250).. START
THR LEVERS.. IDLE
GLDG DIST: 2NM/1000FT
DIVERSION..INITIATE

L2 *Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.*

L1 ALL ENG FAIL PROC.. APPLY

L2 *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL.*
The QRH procedure provides the landing configuration and the approach speed for a ditching and a forced landing.

Continued on the following page

ENG ALL ENGINES FAILURE (Cont'd)

1 Ident.: PRO-ABN-ENG-DM-00021555.0002001 / 04 SEP 17

L12

STATUS

MAX SPEED.. 330/0.82
MIN RAT SPEED.. 140 KT
MANEUVER WITH CARE
AVOID ICING CONDITIONS

- **IF SEVERE ICE ACCRETION:**

  MIN SPD.. VLS+10/G DOT

  Note: *The speed must no be lower than:*
  - *G DOT when CONF 0, and*
  - *VLS + 10 kt for other configurations.*

MAX BRK PR...1000 PSI

APPR PROC

LAND ASAP

- **FOR SLATS EXTENSION:**

  LAND RECOVERY..ON

  Selecting LAND RECOVERY ON for approach enables recovery of ILS 1, LGCIU and SFCC1.

FOR LDG...USE FLAP2

This line is replaced by "FOR LDG: USE FLAP2" when CONF 2 is selected, as a reminder.

L/G GRVTY EXTN..AS RQRD

The QRH procedure indicates whether the landing gear must be kept up (ditching anticipated, Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated) or extended by gravity (forced landing anticipated, Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated).

PITCH AUTHORITY REDUCED

ALTN LAW: PROT LOST

INOP SYS

See below

Continued on the following page

ENG ALL ENGINES FAILURE (Cont'd)

CONSIDER APU GEN USE
MCDU BACK UP NAV AVAIL

AFTER LAND RECOVERY: LGCIU 1, SLATS CHANNEL 1 are recovered. SLATS SLOW is displayed in the STATUS. Remaining fuel pump stops, ALL F PUMPS is displayed in the INOP SYS list.

Note: STATUS is simplified in ALL ENGINES FAILURE configuration, only the most important STATUS items are kept.

INOP SYS

F/CTL PROT
PACK 1+2
RA 1+2
RUD TRIM
VHF 2+3
CAT 2
N/W STRG
MOST F. PUMPS

STABILIZER
PRIM 2+3
A/CALL OUT
WING A.ICE
MOST SPLRS
HF 1+2
AUTO BRK
ADS-B ◁

B+Y HYD
ADR 2+3
ANTI SKID
AP 1+2
REVERSERS
IR 2
ALTN BRK
GPS 1+2 ◁

ENG ALL ENGINES FAILURE

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

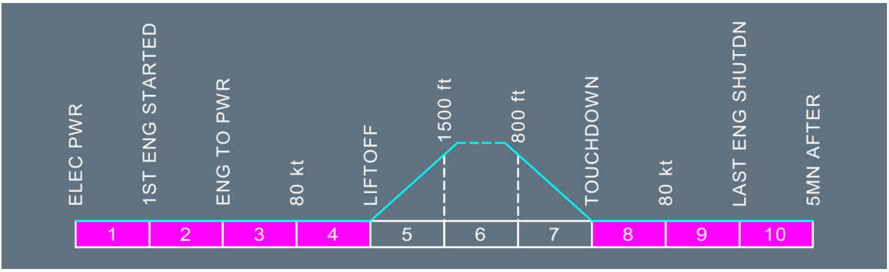
Ident.: PRO-ABN-ENG-DM-00018372.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers in the case of all engines failure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG ALL ENGINES FAILURE (Cont'd)

Ident.: PRO-ABN-ENG-DM-00017079.0004001 / 17 MAR 17

L2 The ENG ALL ENGINES FAILURE ECAM alert inhibits the ELEC EMER CONFIG ECAM alert, and provides the flight crew with an associated procedure to immediately apply in the case of a failure of all engines. The purpose of the ENG ALL ENGINES FAILURE ECAM procedure is to secure both the automatic extension of the RAT and the automatic connection of the emergency generator. Then, the ENG ALL ENGINES FAILURE ECAM procedure specifies that the flight crew must apply the ALL ENGINES FAILURE QRH procedure.

L1 **LAND ASAP**

RAT.. MAN ON
EMER ELEC PWR (IF NOT AUTOMATICALLY COUPLED).. MAN ON
OPT RELIGHT SPD.. 300/0.82

L2 *In the case of a speed indication failure due to volcanic ash, the pitch altitude for optimum relight is provided in the QRH procedure.*

L1 APU (BELOW FL 250).. START
THR LEVERS.. IDLE
GLDG DIST: 2NM/1000FT
DIVERSION.. INITIATE

L2 *Check if there is an accessible runway, or determine the most appropriate area for a forced landing or ditching.*

L1 ALL ENG FAIL PROC.. APPLY

L2 *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL.*
The QRH procedure provides the landing configuration and the approach speed for a ditching and a forced landing. Disregard the landing configuration and the approach speed displayed on the ECAM STATUS page.

ENG 1(2) EIVMU FAULT
(IN FLIGHT)

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

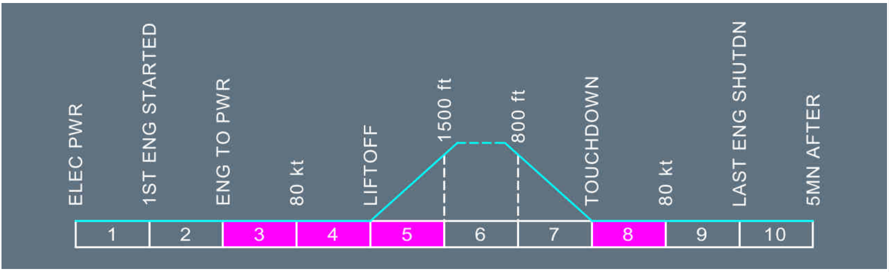
Ident.: PRO-ABN-ENG-DO-00020538.0003001 / 06 DEC 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the databus between the EIVMU and the FADEC is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EIVMU FAULT (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-ENG-DO-00020539.0004001 / 04 DEC 18

L2 The following consequences affect the aircraft when this alert is triggered:
- Autothrust control is lost,
- Thrust reverser is lost on the affected engine,
- When idle is selected, only high ground idle is available on the affected engine,
- Bleed corrections on N1 limit are lost on the affected engine,
- Manual start is lost on the affected engine,
- Flex takeoff is lost,
- For aircraft equipped with GE engines, the affected engine's anti-ice fault light may be ON on ground, if the engine does not run,
- For aircraft equipped with GE engines, when the crossbleed valve is open on ground, the 2 packs may be controlled closed.

L1 Note: *For aircraft equipped with GE or PW engines, the engine anti-ice valves open, and the A.ICE ENG 1(2) VALVE OPEN cautions triggers if continuous ignition is selected. Set the ENG A.ICE pb-sw to ON, to stop the caution.*

THR LEVER (affected engine)..MAN ADJUST
ENG (affected) HI IDLE
For aircraft equipped with GE engines.

Ident.: PRO-ABN-ENG-DO-00020540.0007001 / 07 JUL 20

STATUS	INOP SYS
● **For aircraft equipped with GA SOFT ◁ :** GA THR: TOGA ONLY LDG DIST PROC.................... APPLY ENG (affected) HI IDLE ENG (affected) AUTOSTART ONLY CAT 2 ONLY	A/THR REV 1(2) CAT 3 GA SOFT ◁

ENG 1(2) EIVMU FAULT
(IN FLIGHT)

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

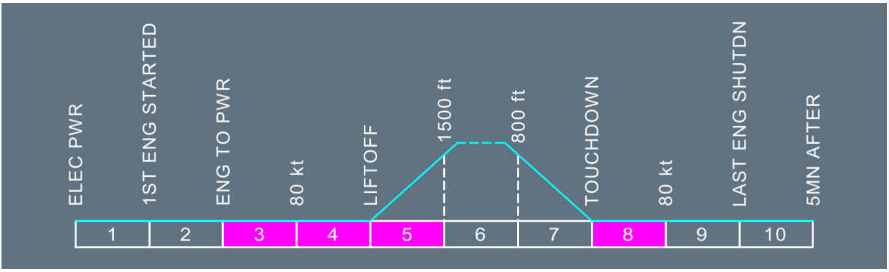
Ident.: PRO-ABN-ENG-DO-00020538.0003001 / 06 DEC 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the databus between the EIVMU and the FADEC is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EIVMU FAULT (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-ENG-DO-00020539.0003001 / 06 DEC 16

L2 The following consequences affect the aircraft when this alert is triggered:
- Autothrust control is lost;
- Thrust reverser is lost on the affected engine;
- When idle is selected, only high ground idle is available on the affected engine;
- Bleed corrections on N1 limit are lost on the affected engine;
- Manual start is lost on the affected engine;
- Flex takeoff is lost;
- For aircraft equipped with GE engines, the affected engine's anti-ice fault light may be ON on ground, if the engine does not run;
- For aircraft equipped with GE engines, when the crossbleed valve is open on ground, the 2 packs may be controlled closed;

L1 Note: *For aircraft equipped with GE or PW engines, the engine anti-ice valves open, and the A.ICE ENG 1(2)VALVE OPEN cautions triggers if continuous ignition is selected. Set the ENG A.ICE pb-sw to ON, to stop the caution.*

THR LEVER (AFFECTED ENGINE)..MAN ADJUST HI IDLE

For aircraft equipped with GE engines

Ident.: PRO-ABN-ENG-DO-00020540.0004001 / 12 JUL 18

STATUS

	INOP SYS
● **For aircraft equipped with GA SOFT ⩤ :** GA THR: TOGA ONLY	A/THR REV 1(2) CAT 3 GA SOFT ⩤
ENG (affected) HI IDLE ENG (affected) AUTOSTART ONLY CAT 2 ONLY	

ENG 1(2) EIVMU FAULT
(ON GROUND)

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

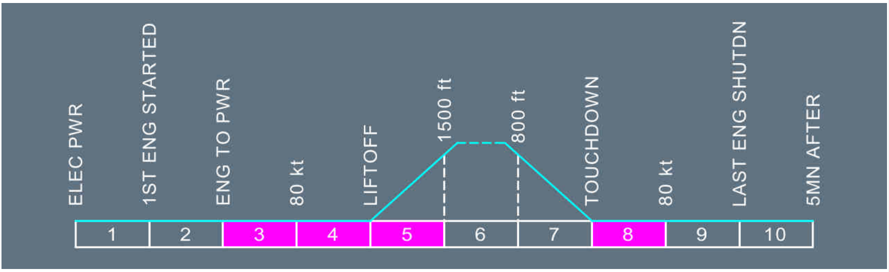
Ident.: PRO-ABN-ENG-DP-00020541.0003001 / 06 DEC 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the databus between the EIVMU and the FADEC is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EIVMU FAULT (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ENG-DP-00020542.0005001 / 04 DEC 18

L2 The following consequences affect the aircraft when this alert is triggered:
- Autothrust control is lost,
- Thrust reverser is lost on the affected engine,
- When idle is selected, only high ground idle is available on the affected engine,
- Bleed corrections on N1 limit are lost on the affected engine,
- Manual start is lost on the affected engine,
- Flex takeoff is lost,
- For aircraft equipped with GE engines, the affected engine's anti -ice fault light may be ON on ground, if the engine does not run,
- For aircraft equipped with GE engines, when the crossbleed valve is open on ground, the 2 packs may be controlled closed.

L1 Note: *For aircraft equipped with PW or GE engines, the engine anti-ice valves open, and the A.ICE ENG 1(2) VALVE OPEN caution triggers if continuous ignition is selected. Set the ENG A.ICE pb-sw to ON, to stop the caution.*

T.O THR: TOGA ONLY
ENG (affected) HI IDLE

L2 *FADEC increases minimum idle on the affected engine, as if the bleed, pack, wing, and anti ice, valves were opened.*

L1 ● **BEFORE T.O:**

PACK 1+2..OFF
ENG (affected) ANTI ICE..ON
WING ANTI ICE..ON

BOTH PACKS AVAIL IN FLT

Continued on the following page

ENG 1(2) EIVMU FAULT (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ENG-DP-00020543.0007001 / 07 JUL 20

STATUS

LDG DIST PROC.. APPLY

T.O THR:TOGA ONLY
ENG (affected) AUTOSTART ONLY
BOTH PACKS AVAIL IN FLT
ENG (affected) HI IDLE
CAT 2 ONLY

INOP SYS

PACK 1+2
A/THR
REV 1(2)
CAT 3

ENG 1(2) EIVMU FAULT
(ON GROUND)

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

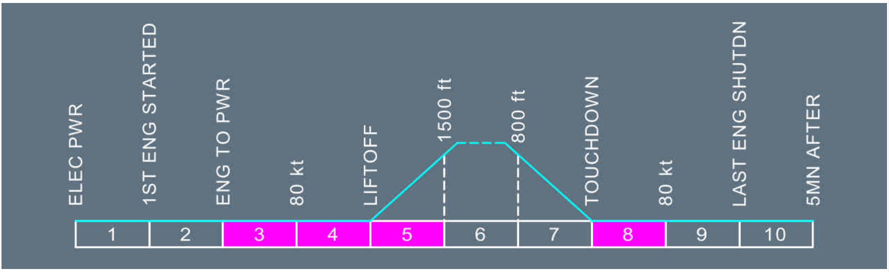
Ident.: PRO-ABN-ENG-DP-00020541.0003001 / 06 DEC 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the databus between the EIVMU and the FADEC is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EIVMU FAULT (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ENG-DP-00020542.0004001 / 06 DEC 16

L2 The following consequences affect the aircraft when this alert is triggered:
- Autothrust control is lost,
- Thrust reverser is lost on the affected engine,
- When idle is selected, only high ground idle is available on the affected engine,
- Bleed corrections on N1 limit are lost on the affected engine,
- Manual start is lost on the affected engine,
- Flex takeoff is lost.
- For aircraft equipped with GE engines, the affected engine's anti -ice fault light may be ON on ground, if the engine does not run,
- For aircraft equipped with GE engines, when the crossbleed valve is open on ground, the 2 packs may be controlled closed.

L1 Note: *For aircraft equipped with PW or GE engines, the engine anti-ice valves open, and the A.ICE ENG 1(2) VALVE OPEN caution triggers if continuous ignition is selected. Set the ENG A.ICE pb-sw to ON, to stop the caution.*

T.O THR:TOGA ONLY
HI IDLE

L2 *FADEC increases minimum idle on the related engine, as if the bleed, pack, wing, and anti ice, valves were opened.*

L1 ● **BEFORE T.O:**

PACK 1+2...OFF
ENG (AFFECTED ENGINE) ANTI ICE...ON
WING ANTI ICE...ON
BOTH PACK AVAIL IN FLT

Continued on the following page

ENG 1(2) EIVMU FAULT (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ENG-DP-00020543.0004001 / 06 DEC 16

STATUS

T.O THR:TOGA ONLY
ENG (affected) AUTOSTART ONLY
BOTH PACKS AVAIL IN FLT
ENG (affected) HI IDLE
CAT 2 ONLY

INOP SYS

PACK 1+2
A/THR
REV 1(2)
CAT 3

ENG 1(2) EPR MODE FAULT

Applicable to: LV-KHT, LV-KHU

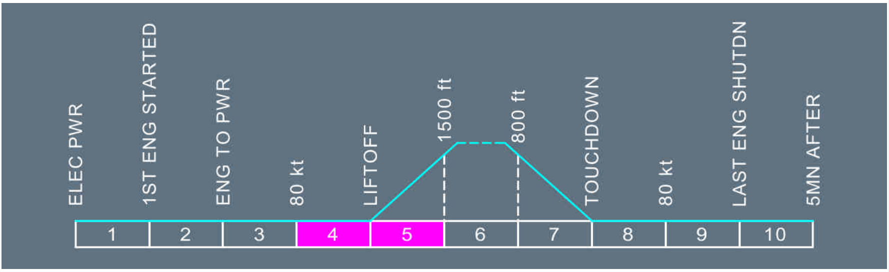
Ident.: PRO-ABN-ENG-AE-00018313.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when FADEC of the affected engine has automatically reverted to the N1 mode.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) EPR MODE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-AE-00018568.0007001 / 17 NOV 20

- **On ground:**
  - **If rated N1 MODE is active:**

    T.O THRUST LIMITED

    L2 *When dispatching in rated N1 MODE, apply thrust penalties given in the MMEL.*

    L1 ALL ENG N1 MODE....................ON

    L2 *N1 mode is confirmed on the affected engine.*
    The other engine must be reverted to N1 mode, to ease thrust setting.

  - L1 **If degraded N1 MODE is active:**

    N1 DEGRADED MODE

    L2 *Dispatch in degraded N1 mode is not allowed.*

- L1 **In flight:**
  - **If rated N1 MODE is active:**

    ALL ENG N1 MODE....................ON
    A/THR....................AS RQRD

    L2 *Autothrust is available in rated N1 mode.*

  - L1 **If degraded N1 MODE is active:**

    N1 DEGRADED MODE

    DO NOT EXCEED N1 LIMIT

    L2 *As there is no N1 rating limit, an overboost can occur at the full forward thrust lever position.*

    L1

CAUTION	*Before selection of N1 mode when the autothrust is not available, THR LEVERS should be set to a detent not higher than CLB, in order to prevent an overspeed.*

    ALL ENG N1 MODE....................ON

    - **IF A/THR is available:**

      L2 In degraded N1 mode, autothrust is available, if no more than one engine is in degraded mode.

      L1 A/THR....................AS RQRD

Continued on the following page

ENG 1(2) EPR MODE FAULT (Cont'd)

- **IF A/THR is not available:**

  MAN THR..ADJUST

L2 *Refer to EFB-THR-N1 N1 MODE THRUST CONTROL for power management tables when the engines are in degraded mode.*

Ident.: PRO-ABN-ENG-AE-00018569.0005001 / 21 MAR 16

STATUS

- **On ground, if rated N1 MODE is active:**

  T.O THRUST LIMITED

- **If degraded N1 MODE is active:**

  ENG 1(2) N1 DEGRADED MODE

- **If one engine not in N1 MODE, or A/THR not available:**

  CAT 2 ONLY

- **If all engines in N1 MODE and A/THR available:**

  CAT 1 WITH A/THR

  CAT 2 WITH MAN THR

INOP SYS

CAT 3

A/THR (1)

(1) *(If A/THR is not available)*

ENG 1(2) FADEC HI TEMP

Applicable to: LV-KHT

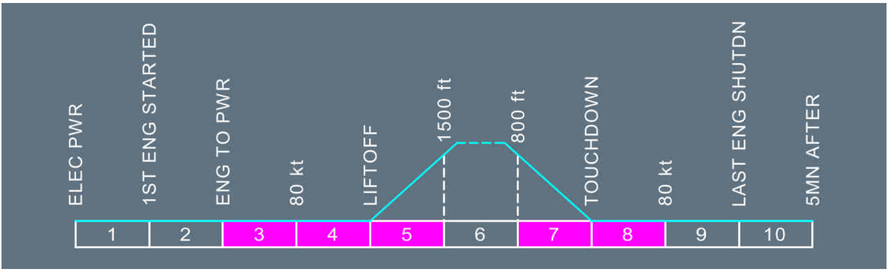
Ident.: PRO-ABN-ENG-DS-00021321.0001001 / 04 SEP 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FADEC reaches a significant high temperature.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
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Ident.: PRO-ABN-ENG-DS-00021322.0003001 / 04 SEP 17

Crew awareness.

ENG 1(2) FADEC COOL FAULT

Applicable to: LV-KHU

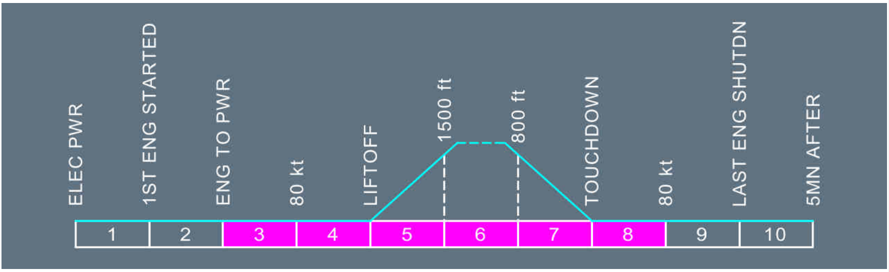
Ident.: PRO-ABN-ENG-AU-00018321.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FADEC cooling system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-AU-00018575.0003001 / 21 MAR 16

Crew awareness.

ENG 1(2) FADEC FAULT

Applicable to: LV-KHT, LV-KHU

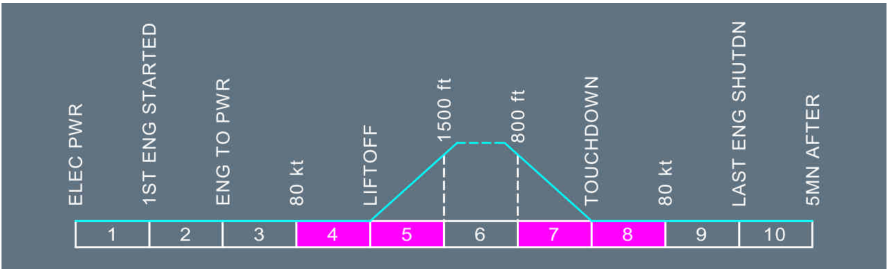
Ident.: PRO-ABN-ENG-AV-00018322.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the data bus between FADEC and ECAM is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-AV-00013712.0001001 / 21 MAR 16

CONFIRM ENG STATUS ON DISPLAYS

L2 *Since engine indications are lost ; other system pages such as HYD SD page, ELEC AC SD page, or BLEED SD page must be used to confirm engine status.*

L1 ● **IF ABN ENG OPERATION:**

THR LEVER (AFFECTED ENGINE).. IDLE
ENG MASTER (AFFECTED ENGINE)..OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) **SHUT DOWN**

Apply ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) FADEC IDENT FAULT

Applicable to: LV-KHT, LV-KHU

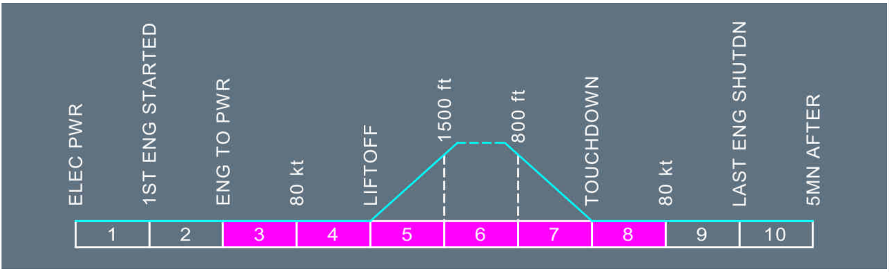
Ident.: PRO-ABN-ENG-AW-00018323.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the FADEC cannot identify the engine configuration.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-AW-00018576.0003001 / 21 MAR 16

Crew awareness.

ENG 1(2) FADEC OVHT OR FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

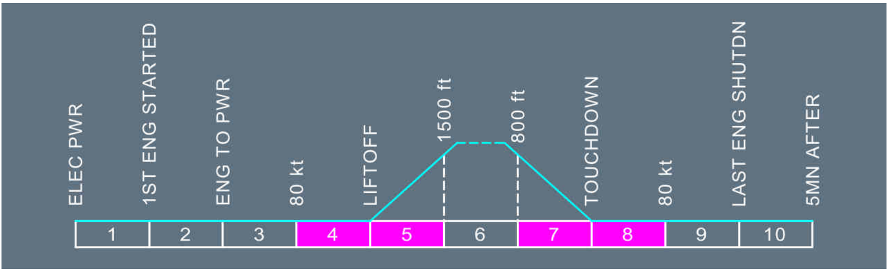
Ident.: PRO-ABN-ENG-AY-00018706.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when data bus between FADEC and ECAM is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-AY-00018579.0001001 / 21 MAR 16

CONFIRM ENG STATUS ON DISPLAYS

L2 *Engine indications are lost : Other system pages such as HYD SD page, ELEC AC SD page, or BLEED SD page must be used to confirm engine status.*

L1 ● **IF ABN ENG OPERATION:**

THR LEVER (AFFECTED ENGINE).. IDLE
ENG MASTER (AFFECTED ENGINE)..OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

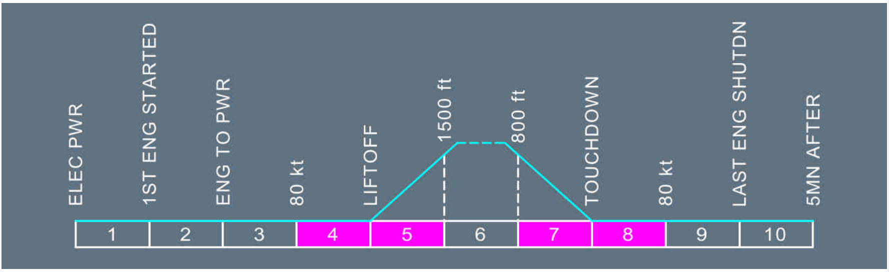
ENG 1(2) FADEC OVHT

Applicable to: LV-KHT, LV-KHU

Ident.: PRO-ABN-ENG-BA-00018350.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BA-00013711.0001001 / 17 MAR 11

THR LEVER (AFFECTED ENGINE)..IDLE
ENG MASTER (AFFECTED ENGINE)..OFF

ENG 1(2) FADEC SYS FAULT

Applicable to: ALL

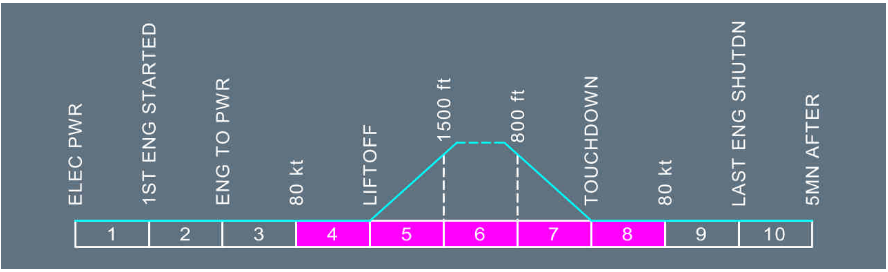
Ident.: PRO-ABN-ENG-I-00018353.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a NO DISPATCH failure affects one or both channels (failure of sensor, channel, etc...).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-I-00018848.0002001 / 21 MAR 16

THR LEVER 1(2)..IDLE
ENG MASTER 1(2)..OFF

ENG 1(2) FAIL

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

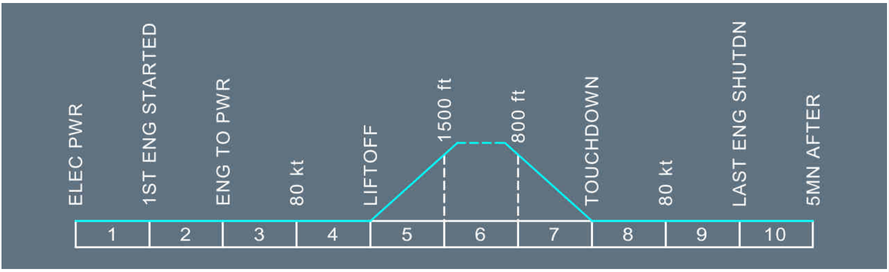
Ident.: PRO-ABN-ENG-BC-00018354.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when engine core speed is below idle with MASTER sw ON, and FIRE pb not pushed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) FAIL (Cont'd)

Ident.: PRO-ABN-ENG-BC-00018582.0010001 / 07 JUL 20

L2 An engine flame-out may be recognized by a rapid decrease in EGT, N2, FF, followed by a decrease in N1.

Engine damage may be accompanied by:
- Explosions
- Significant increase in aircraft vibrations and/or buffeting
- Repeated, or uncontrollable engine stalls
- Associated abnormal indications, such as hydraulic fluid loss, no N2 (N2 or N3 for RR engines) indication.

L1 **LAND ASAP**

■ In the case of SHAFT FAILURE (for RR engines):

L2 The FADEC automatically shuts down the engine.

L1 **● During takeoff phase:**

L/G.. UP

THR LEVER (AFFECTED ENGINE).. IDLE
ENG MASTER (AFFECTED ENGINE)..OFF
ENG FIRE P/B (AFFECTED ENGINE)..PUSH
AGENT 1..DISCH
L+R INR TK SPLIT...ON

■ Before takeoff, or after landing:

THR LEVER (AFFECTED ENGINE).. IDLE
ENG MASTER (AFFECTED ENGINE)..OFF

■ IF DAMAGE:

ENG FIRE P/B (AFFECTED ENGINE).. PUSH
AGENT 1.. DISCH
L + R INR TK SPLIT.. ON

■ IF NO DAMAGE:

ENG (AFFECTED) RELIGHT...CONSIDER

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Continued on the following page

ENG 1(2) FAIL (Cont'd)

Apply the ENG 1(2) SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN), if damage, or if engine relight is unsuccessful.

- **In flight:**

ENG START SEL.. IGN

L2 *Selection of continuous ignition confirms the FADEC's immediate relight attempt. It also protects the remaining engine.*

L1 ● **During takeoff phase:**

L/G.. UP

THR LEVER (AFFECTED ENGINE).. IDLE

L2 *Note: In the case of GPWS (EGPWS ◁) alerts, reduce speed with care below VLS with the flaps extended (at light weights VMCA/VMCL may be reached before α max), when applying the GPWS (EGPWS ◁) procedure.*

L1 ● **IF NO ENG RELIGHT AFTER 30 S:**

L2 The 30 s countdown starts as soon as the ENG 1(2) FAIL alert is triggered.

L1 ENG MASTER (AFFECTED ENGINE).. OFF

■ **IF DAMAGE:**

ENG FIRE P/B (AFFECTED ENGINE).. PUSH

L2 *If the ENG FIRE pb-sw is pushed, the FADEC is no longer supplied.*

L1 AGENT 1 AFTER 10 S.. DISCH

L+R INR TK SPLIT.. ON

L2 *Note: If no fuel leak is evident, set both INR TK SPLIT pb-sw back to the normal position.*

L1 ■ **IF NO DAMAGE:**

ENG (AFFECTED) RELIGHT.. CONSIDER

L2 *Apply the ENG RELIGHT (in flight) procedure (Refer to PRO-ABN-ENG [QRH] ENG RELIGHT IN FLIGHT).*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG 1(2) SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN), if damage, or if engine relight is unsuccessful.

Continued on the following page

ENG 1(2) FAIL (Cont'd)

If high engine vibrations occur and continue after engine shutdown, reduce airspeed and descend to a safe altitude.
Attempt to define, and use, a practical airspeed and altitude for minimum vibrations.
For performance reasons, the landing is in CONF 3. CONF 3 should be selected, as the landing configuration, on the MCDU.

ENG 1(2) FAIL

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

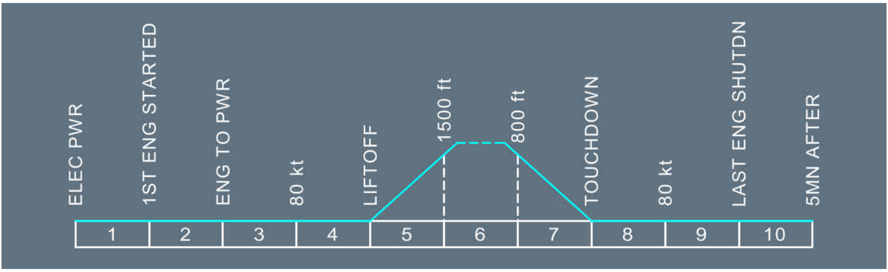
Ident.: PRO-ABN-ENG-BC-00018354.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when engine core speed is below idle with MASTER sw ON, and FIRE pb not pushed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) FAIL (Cont'd)

Ident.: PRO-ABN-ENG-BC-00018582.0006001 / 04 JUN 19

L2 An engine flame-out may be recognized by a rapid decrease in EGT, N2, FF, followed by a decrease in N1.

Engine damage may be accompanied by:
- Explosions
- Significant increase in aircraft vibrations and/or buffeting
- Repeated, or uncontrollable engine stalls
- Associated abnormal indications, such as hydraulic fluid loss, no N2 (N2 or N3 for RR engines) indication.

L1 LAND ASAP

■ **In the case of shaft failure (for RR engines):**

SHAFT FAILURE

L2 *The FADEC automatically shuts down the engine.*

L1
THR LEVER (AFFECTED ENGINE).......... IDLE
ENG MASTER (AFFECTED ENGINE)..........OFF
ENG FIRE P/B (AFFECTED ENGINE)..........PUSH
AGENT 1..........DISCH
L+R INR TK SPLIT..........ON

■ **Before takeoff, or after landing:**

THR LEVER (AFFECTED ENGINE).......... IDLE
ENG MASTER (AFFECTED ENGINE)..........OFF

■ **IF DAMAGE:**

ENG FIRE P/B (AFFECTED ENGINE).......... PUSH
AGENT 1.......... DISCH
L + R INR TK SPLIT.......... ON

■ **IF NO DAMAGE:**

ENG (AFFECTED) RELIGHT..........CONSIDER

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN), if damage, or if engine relight is unsuccessful.

Continued on the following page

ENG 1(2) FAIL (Cont'd)

- **In flight:**

ENG START SEL...IGN

L2 *Selection of continuous ignition confirms the FADEC's immediate relight attempt.*
It also protects the remaining engine.

L1 THR LEVER (AFFECTED ENGINE)...IDLE

L2 *Note: In the case of GPWS (EGPWS ◁) alerts, reduce speed with care below VLS with the flaps extended (at light weights VMCA/VMCL may be reached before α max), when applying the GPWS (EGPWS ◁) procedure.*

L1 ● **IF NO ENG RELIGHT AFTER 30 S:**

L2 The 30 s countdown starts as soon as the ENG 1(2) FAIL alert is triggered.

L1 ENG MASTER (AFFECTED ENGINE)..OFF

- **IF DAMAGE:**

ENG FIRE P/B (AFFECTED ENGINE)..PUSH

L2 *If the ENG FIRE pb-sw is pushed, the FADEC is no longer supplied.*

L1 AGENT 1 AFTER 10 S..DISCH
L+R INR TK SPLIT...ON

L2 *Note: If no fuel leak is evident, set both INR TK SPLIT pb-sw back to the normal position.*

L1
- **IF NO DAMAGE:**

ENG (AFFECTED) RELIGHT...CONSIDER

L2 *Apply the ENG RELIGHT (in flight) procedure (Refer to PRO-ABN-ENG [QRH] ENG RELIGHT IN FLIGHT).*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN), if damage, or if engine relight is unsuccessful.
If high engine vibrations occur and continue after engine shutdown, reduce airspeed and descend to a safe altitude.
Attempt to define, and use, a practical airspeed and altitude for minimum vibrations.
For performance reasons, the landing is in CONF 3. CONF 3 should be selected, as the landing configuration, on the MCDU.

ENG 1(2) FIRE
(IN FLIGHT)

Applicable to: ALL

Ident.: PRO-ABN-ENG-EA-00017466.0001001 / 21 MAR 16

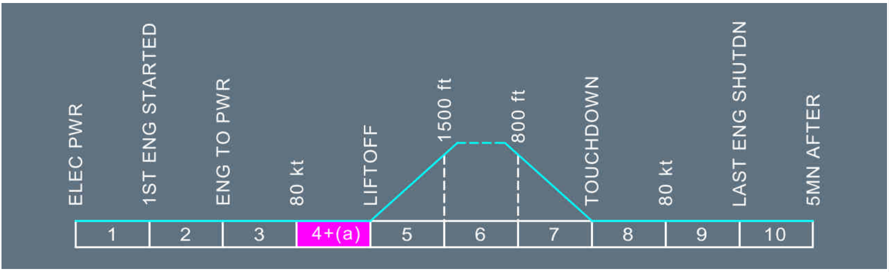
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Fire is detected by both loops, or
- Fire is detected by one loop when the other loop is failed, or
- A rupture occurs in both loops within 5 s.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5
6
7
8
9
10

Note: *(a) Alert inhibited between V1 and lift off +15 s.*

Continued on the following page

ENG 1(2) FIRE (Cont'd)
(IN FLIGHT)

Ident.: PRO-ABN-ENG-EA-00011607.0003001 / 14 FEB 17

LAND ASAP

THR LEVER (AFFECTED)........................IDLE
ENG MASTER (AFFECTED)........................OFF

L2 *Associated LP and HP valves close.*

L1 ENG FIRE P/B (AFFECTED)........................PUSH

L2 *When pushed:*
- *Aural warning stops*
- *The light remains on, until the fire is extinguished, regardless of the position of the ENG FIRE pb-sw*
- *FADEC is no longer supplied.*

L1 ENG BLEED (AFFECTED ENG IF NOT AUTOMATICALLY CLOSED)........................OFF
APU BLEED (ONLY FOR ENG 1)........................OFF
X BLEED (IF NOT AUTOMATICALLY CLOSED)........................CLOSE
WING ANTI ICE........................OFF

L2 *The affected side is isolated from any source of air.*

L1 AGENT 1 AFT 10 S........................DISCH

L2 *The 10 s delay allows N1 to decrease, reducing nacelle ventilation, and thereby increasing the effect of the agent. Automatic countdown on the ECAM.*

L1 ATC........................NOTIFY

L2 *Notify ATC of the nature of the emergency, and state intentions.*

L1 ● **IF FIRE AFTER 30 S:**
AGENT 2........................DISCH

L2 *Discharge the second agent, if the fire warning remains 30 s after the discharge of the first agent.*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Do not attempt to restart the engine.

Continued on the following page

ENG 1(2) FIRE (Cont'd)
(IN FLIGHT)

For the ENG SHUT DOWN procedure, see the ENG section (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN).

ENG 1(2) FIRE
(ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-ENG-EB-00018638.0001001 / 21 MAR 16

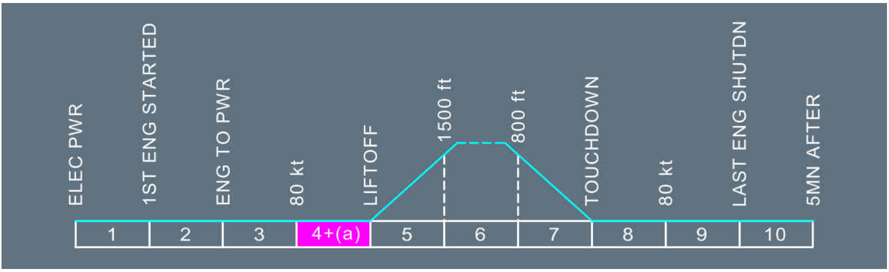
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Fire is detected by both loops, or
- Fire is detected by one loop when the other loop is failed, or
- A rupture occurs in both loops within 5 s.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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4+(a)
5
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9
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Note: (a) Alert inhibited between V1 and lift off +15 s.

Continued on the following page

ENG 1(2) FIRE (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-ENG-EB-00017944.0002001 / 25 APR 17

THR LEVERS.......................................IDLE

L2 *Full reverse may be used to stop the aircraft.*

L1 ● **WHEN A/C IS STOPPED:**

PARKING BRK.......................................ON

ATC (VHF1).......................................NOTIFY

L2 *Notify ATC of the nature of the emergency, and state intentions.*
Only VHF1 is available on batteries.

L1 CABIN CREW (PA).......................................ALERT

L2 *Make a short and precise announcement to warn the cabin crew that an emergency evacuation may be required.*

L1 ENG MASTER (AFFECTED).......................................OFF

L2 *Associated LP and HP valves close.*

L1 ENG FIRE P/B (AFFECTED).......................................PUSH

L2 *When pushed:*
- *Aural warning stops*
- *The light remains on, until the fire is extinguished, regardless of the position of the ENG FIRE pb-sw*
- *FADEC is no longer supplied.*

L1 AGENT 1+2.......................................DISCH

DELTA P (IF MAN CAB PR WAS USED).......................................CHECK ZERO

L2 *If ΔP is not at zero, MODE SEL on MAN and V/S CTL FULL UP, to fully open the outflow valve.*

L1 ENG MASTER (OPPOSITE SIDE).......................................OFF

ENG FIRE P/B (OPPOSITE SIDE).......................................PUSH

■ **IF EVAC RQRD:**

EVACUATION.......................................INITIATE

L2 *Make a short and precise announcement to order the emergency evacuation.*
Press the EVAC COMMAND pb ◁ .

L1 APU MASTER SW.......................................OFF

■ **IF EVAC NOT RQRD:**

CABIN CREW + PAX (PA).......................................NOTIFY

ENG 1(2) FIRE DET FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-EG-00020740.0001001 / 17 MAR 17

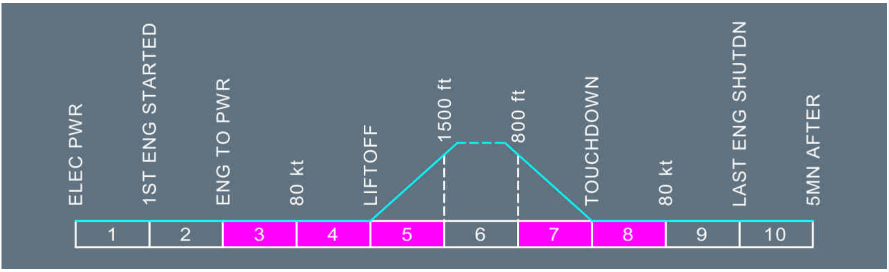
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Both loops are inoperative, or
- Fire Detection Unit is inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-EG-00020739.0001001 / 17 MAR 17

L2 Loss of both fire detection loops. In the case of a fire, there will be no alerts in the cockpits.

L1 Crew awareness.

Ident.: PRO-ABN-ENG-EG-00020741.0001001 / 17 MAR 17

STATUS

INOP SYS

FIRE DET 1 (2)

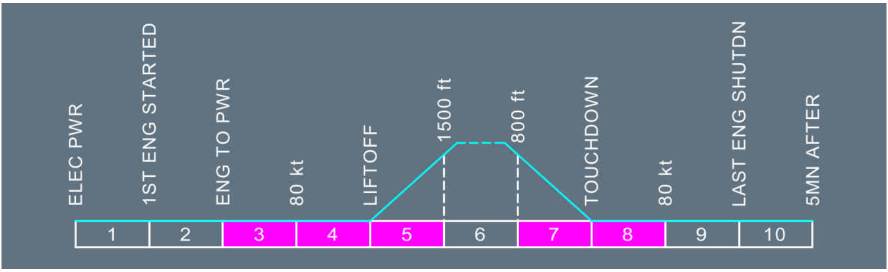
ENG 1(2) FIRE LOOP A(B) FAULT

Applicable to: ALL

Ident.: PRO-ABN-ENG-EH-00020747.0001001 / 17 MAR 17

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-EH-00020746.0001001 / 17 MAR 17

Crew awareness.

Ident.: PRO-ABN-ENG-EH-00020748.0001001 / 17 MAR 17

STATUS

INOP SYS

ENG 1(2)
LOOP A (B)

ENG 1(2) FUEL FILTER CLOG

Applicable to: ALL

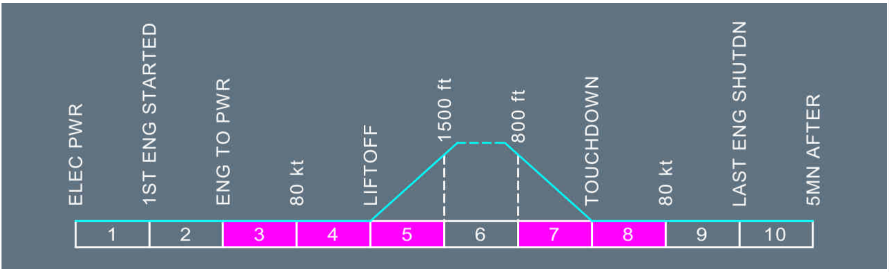
Ident.: PRO-ABN-ENG-BE-00018356.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fuel filter is clogged.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BE-00011687.0001001 / 16 JAN 18

Crew awareness.

L2 Maintenance action is due. The fuel filter is bypassed and short term engine operation is not affected. Dual fuel filter clog is likely an indication of fuel contamination

ENG 1(2) FUEL LEAK

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO

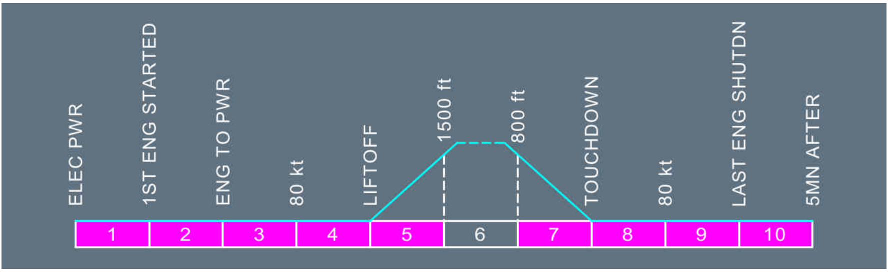
Ident.: PRO-ABN-ENG-BG-00018359.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when an abnormal difference among the engine is detected, either in fuel flow or in the fuel used.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) FUEL LEAK (Cont'd)

Ident.: PRO-ABN-ENG-BG-00018652.0005001 / 07 JUL 20

L2 This alert could indicate a fuel leak downstream of the Fuel Metering Valve (FMV). In such a case, the FUEL F. USED/FOB DISAGREE alert will not be triggered. A low N1 indication may indicate a fuel leak. The flight crew should check fuel parameters to confirm the leak. Check parameters like FOB, FU, fuel flow, fuel distribution, fuel imbalance to confirm the fuel leak.

L1 ENG 1+2 PARAM...CHECK
FUEL PARAMETERS...CHECK

- **IF LEAK CONFIRMED:**
  THR LEVER (AFFECTED ENGINE)...IDLE
  ENG MASTER (AFFECTED ENGINE)...OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

L2 *Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN.*

ENG 1(2) FUEL LEAK

Applicable to: LV-FVI, LV-KAN, LV-KAO

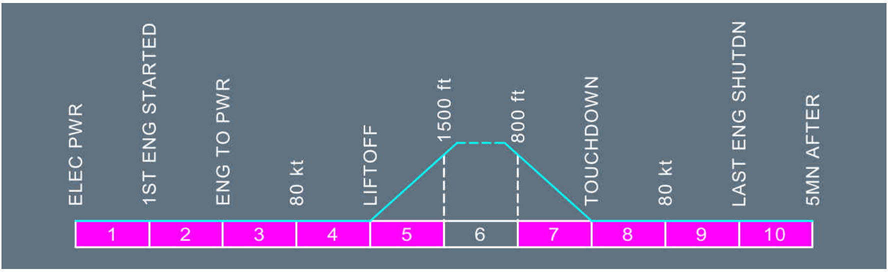
Ident.: PRO-ABN-ENG-BG-00018359.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when an abnormal difference among the engine is detected, either in fuel flow or in the fuel used.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ENG-BG-00018652.0004001 / 28 MAY 20

L2 This alert could indicate a fuel leak downstream of the Fuel Metering Valve (FMV). In such a case, the FUEL F. USED/FOB DISAGREE alert will not be triggered. A low N1 indication may indicate a fuel leak. The flight crew should check fuel parameters to confirm the leak. Check parameters like FOB, FU, fuel flow, fuel distribution, fuel imbalance to confirm the fuel leak.

L1 ● **IF LEAK CONFIRMED:**

THR LEVER (AFFECTED ENGINE).. IDLE
ENG MASTER (AFFECTED ENGINE)..OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

L2 *Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN.*

ENG 1(2) HP FUEL VALVE

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

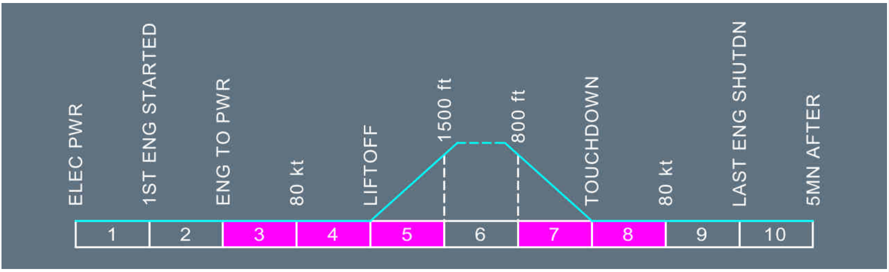
Ident.: PRO-ABN-ENG-BI-00018389.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when fuel valve is failed in close, or open position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) HP FUEL VALVE (Cont'd)

Ident.: PRO-ABN-ENG-BI-00011787.0002001 / 12 JUL 18

- **Associated engine below idle:**

  HP FUEL VALVE NOT OPEN

L2 *Failure of high pressure fuel valve.*

L1 MAN START (AFFECTED ENGINE)....................OFF
ENG MASTER (AFFECTED ENGINE)....................OFF

- **Associated engine at or above idle:**

  HP FUEL VALVE NOT CLSD

L2 *Failure of high pressure fuel valve.*
Engine will shut down by closure of the fuel low pressure valve.

L1 MAN START (AFFECTED ENGINE)....................OFF
ENG MASTER (AFFECTED ENGINE)....................OFF

- **If the affected engine is still running 10 s after the engine master lever is set to OFF:**

  ENG FIRE P/B....................PUSH

L2 Note: *In case there is no fuel in engine fuel system, the high pressure fuel valve may be unduly detected open while being closed.*

L1

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN

ENG 1(2) HP FUEL VALVE

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

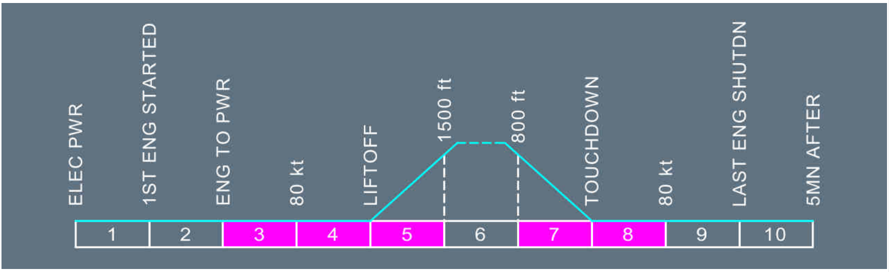
Ident.: PRO-ABN-ENG-BI-00018389.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when fuel valve is failed in close, or open position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BI-00011787.0001001 / 09 NOV 17

- **Associated engine below idle:**

HP FUEL VALVE NOT OPEN

L2 *Failure of high pressure fuel valve.*

L1 MAN START (AFFECTED ENGINE)....................OFF
ENG MASTER (AFFECTED ENGINE)....................OFF

- **Associated engine at or above idle:**

HP FUEL VALVE NOT CLSD

L2 *Failure of high pressure fuel valve.*
Engine will shut down by closure of the fuel low pressure valve.

L1 MAN START (AFFECTED ENGINE)....................OFF
ENG MASTER (AFFECTED ENGINE)....................OFF

L2 *Note:* *In case there is no fuel in engine fuel system, the high pressure fuel valve may be unduly detected open while being closed.*

ENG 1(2) IGN A(B) FAULT

Applicable to: ALL

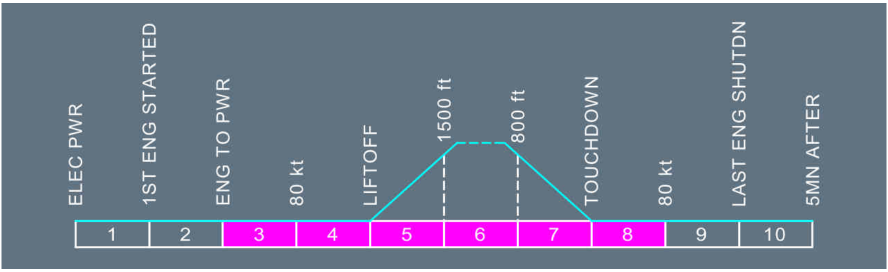
Ident.: PRO-ABN-ENG-P-00018393.0003001 / 15 NOV 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when ignition circuit A or B is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-P-00011693.0003001 / 04 AUG 15

- **If on the same engine the second igniter is inoperative:**
  AVOID ADVERSE WEATHER

Ident.: PRO-ABN-ENG-P-00011695.0003001 / 04 AUG 15

STATUS

- **If on the same engine the second igniter is inoperative:**
  AVOID ADVERSE WEATHER

INOP SYS

ENG 1 (2) IGN A (B)

ENG 1(2) IGN A+B FAULT

Applicable to: ALL

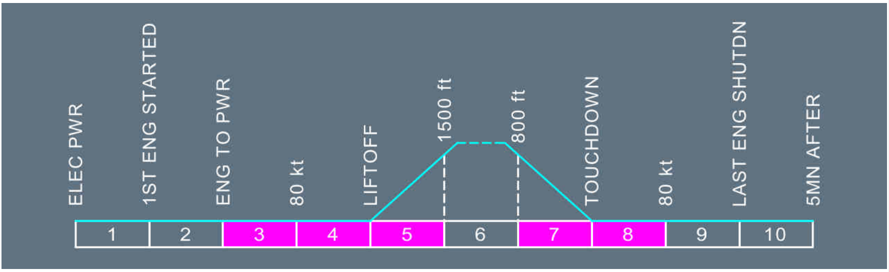
Ident.: PRO-ABN-ENG-Q-00018395.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both ignition circuits are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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5
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10

Ident.: PRO-ABN-ENG-Q-00011698.0001001 / 18 AUG 10

AVOID ADVERSE WEATHER

Ident.: PRO-ABN-ENG-Q-00011699.0001001 / 18 AUG 10

STATUS

	INOP SYS
AVOID ADVERSE WEATHER	ENG 1 (2) IGN

ENG 1(2) IGN SUPPLY FAULT

Applicable to: LV-KHT, LV-KHU

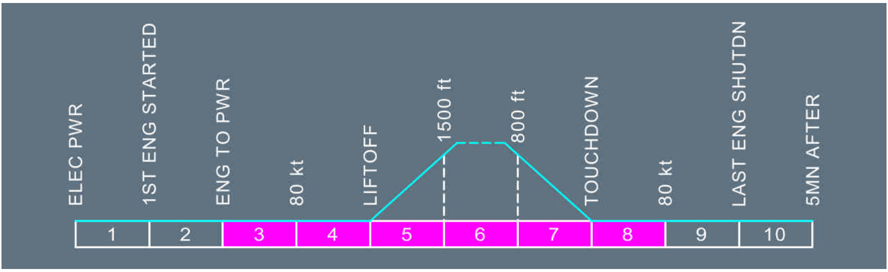
Ident.: PRO-ABN-ENG-BK-00018397.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the emergency power supply of the ignition system is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BK-00018589.0003001 / 21 MAR 16

Crew awareness.

ENG 1(2) LP SHAFT PROT LOSS

Applicable to: LV-KHT, LV-KHU

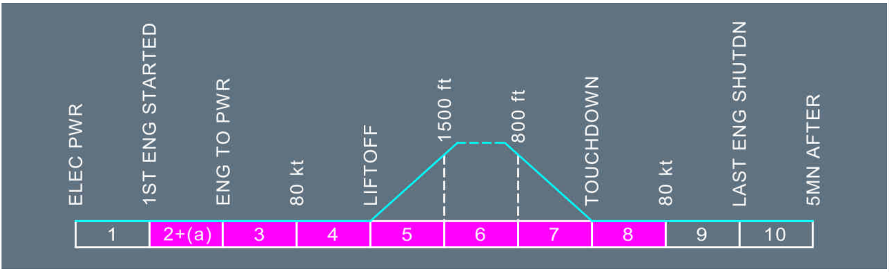
Ident.: PRO-ABN-ENG-BM-00018399.0001001 / 03 NOV 22

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the LP shaft sensor is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2+(a)
3
4
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Note: (a) Inhibited in the case of LP SHAFT PROT LOSS for only one engine.

Ident.: PRO-ABN-ENG-BM-00018593.0003001 / 21 MAR 16

Crew awareness.

ENG 1(2) MINOR FAULT

Applicable to: ALL

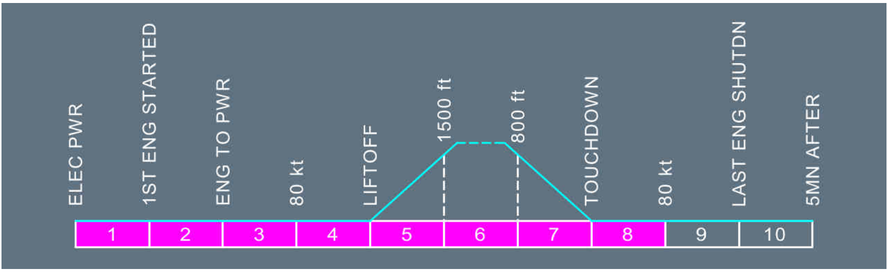
Ident.: PRO-ABN-ENG-BO-00018401.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a minor fault is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BO-00011669.0001001 / 25 FEB 14

Crew awareness.

ENG 1(2) N1/N2 OVERLIMIT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

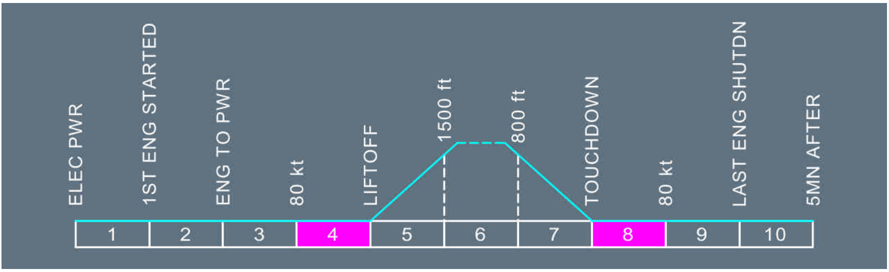
Ident.: PRO-ABN-ENG-BQ-00018403.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the corresponding N1/N2 value is above the red threshold.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) N1/N2 OVERLIMIT (Cont'd)

Ident.: PRO-ABN-ENG-BQ-00011716.0001001 / 21 MAR 16

- **Maximum pointer indications:**

L2 N1 above 115.5 %

N2 above 113 %

L1 THR LEVER (AFFECTED ENGINE)... BELOW LIMIT

L2 *Normal operation may be resumed to next landing.*
Report in maintenance logbook.

L1
- **If THR LEVER at idle for more than 3 s:**

ENG MASTER (AFFECTED ENGINE)...OFF

L2 *If conditions do not permit engine shutdown land as soon as possible using the minimum thrust required to sustain safe flight.*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN

ENG 1(2) N1/N2/N3 OVERLIMIT

Applicable to: LV-KHT, LV-KHU

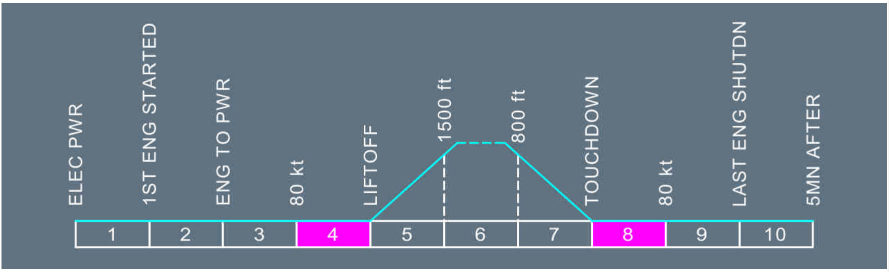
Ident.: PRO-ABN-ENG-BS-00018405.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the corresponding N1/N2/N3 value is above the red threshold.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) N1/N2/N3 OVERLIMIT (Cont'd)

Ident.: PRO-ABN-ENG-BS-00018595.0003001 / 21 MAR 16

- **Maximum pointer indications:**

L2 N1 above 99 %

N2 above 103.3 %

N3 above 100 %

L1 THR LEVER (AFFECTED ENGINE)..BELOW LIMIT

L2 *Normal operation may be resumed.*
Report in the maintenance logbook.

L1
- **If THR LEVER at idle for more than 3 s:**

ENG MASTER (AFFECTED ENGINE)..OFF

L2 *If conditions do not permit engine shutdown, land as soon as possible using the minimum thrust required to sustain a safe flight.*

L1

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN

ENG 1(2) OIL CHIP DETECTED ⩤

Applicable to: LV-KHT, LV-KHU

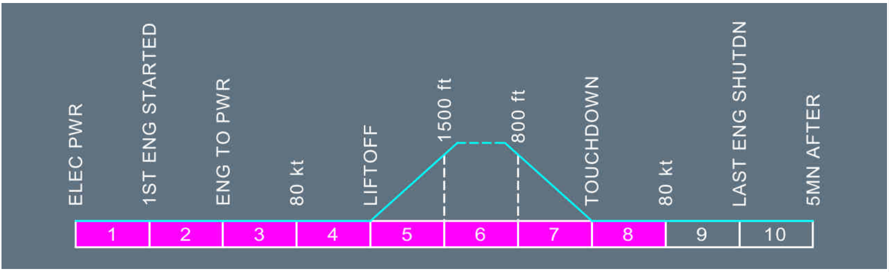
Ident.: PRO-ABN-ENG-BU-00018380.0001001 / 04 JAN 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the metal particles are detected in the oil system.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BU-00018653.0001001 / 04 JAN 17

Crew awareness.

ENG 1(2) OIL FILTER CLOG

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

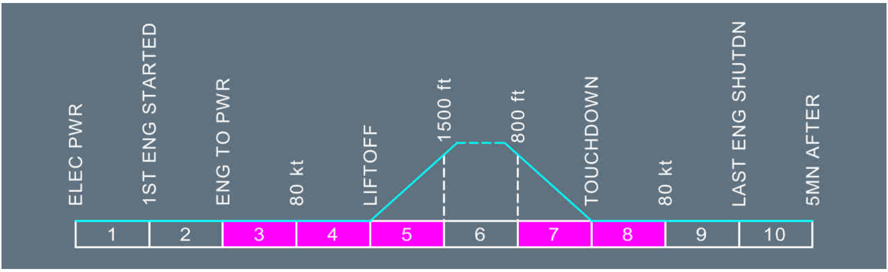
Ident.: PRO-ABN-ENG-BW-00018388.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil filter is clogged.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BW-00018600.0004001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE)....................REDUCE

L2 *Reduce the thrust lever until the caution disappears.*

L1 ENG MASTER (AFFECTED ENGINE)....................OFF

L2 *If the caution is still present with thrust lever at idle, shut down the engine.*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN)

ENG 1(2) OIL FILTER CLOG

Applicable to: LV-KHT, LV-KHU

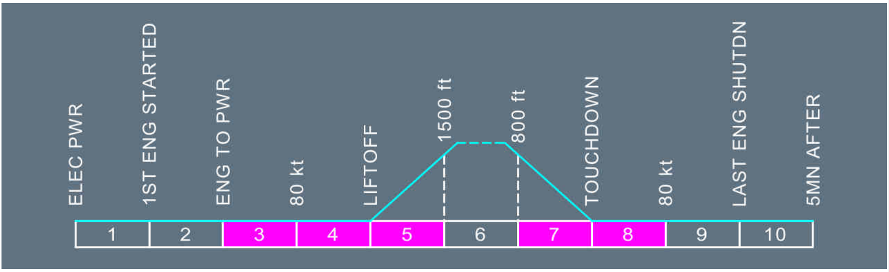
Ident.: PRO-ABN-ENG-BW-00018388.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil filter is clogged.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BW-00018600.0001001 / 21 MAR 16

OIL PR..MONITOR

L2 *Maintenance action is due.*

ENG 1(2) OIL HI TEMP

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

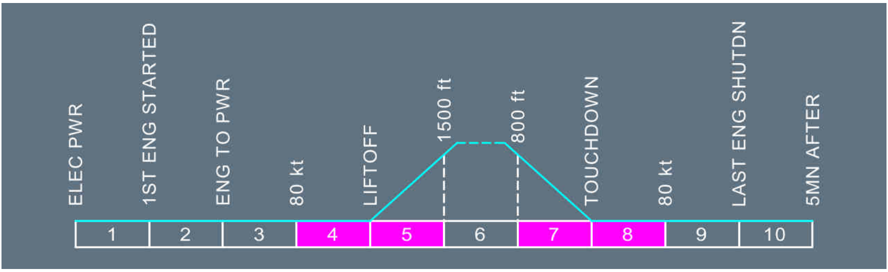
Ident.: PRO-ABN-ENG-BY-00018243.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine oil temperature is between 160 °C and 175 °C for more than 15 min, or the oil temperature is above 175 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-BY-00018612.0001001 / 21 MAR 16

- **For aircraft equipped with GE or PW engines:**
  THR LEVER (AFFECTED ENGINE).. IDLE
- **For aircraft equipped with RR engines:**
  THR LEVER (AFFECTED ENGINE).. REDUCE
  L2 *Gradually reduce thrust on the affected engine in order to decrease oil temperature below the limit.*

L1 ● **If the caution persists with the thrust lever at idle:**
ENG MASTER (AFFECTED ENGINE)..OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN)

ENG 1(2) OIL HI TEMP

Applicable to: LV-KHT, LV-KHU

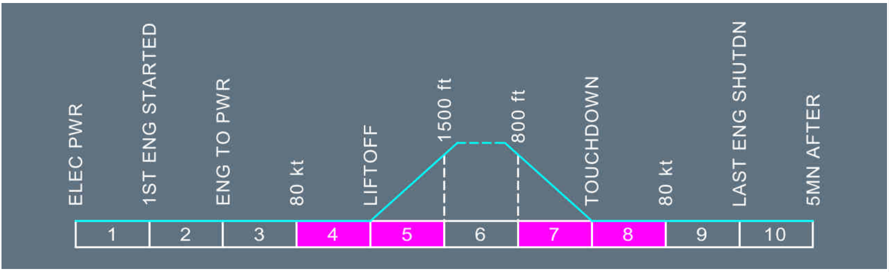
Ident.: PRO-ABN-ENG-BY-00018243.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine oil temperature is above 190 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-ENG-BY-00018612.0001001 / 21 MAR 16

- **For aircraft equipped with GE or PW engines:**
  THR LEVER (AFFECTED ENGINE)........ IDLE
- **For aircraft equipped with RR engines:**
  THR LEVER (AFFECTED ENGINE)........ REDUCE
  L2 *Gradually reduce thrust on the affected engine in order to decrease oil temperature below the limit.*

L1 ● **If the caution persists with the thrust lever at idle:**
ENG MASTER (AFFECTED ENGINE)........OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN)

ENG 1(2) OIL LO PR

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

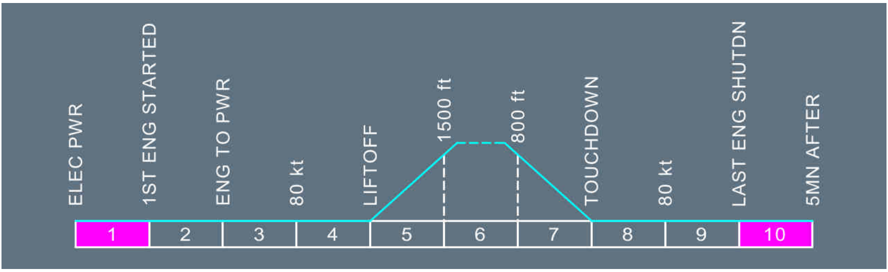
Ident.: PRO-ABN-ENG-CA-00018248.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil pressure is lower than 10 PSI.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-CA-00018616.0003001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE)....................IDLE

- **IF WARNING PERSISTS:**
  ENG MASTER (AFFECTED ENGINE)....................OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN)

ENG 1(2) OIL LO PR

Applicable to: LV-KHT, LV-KHU

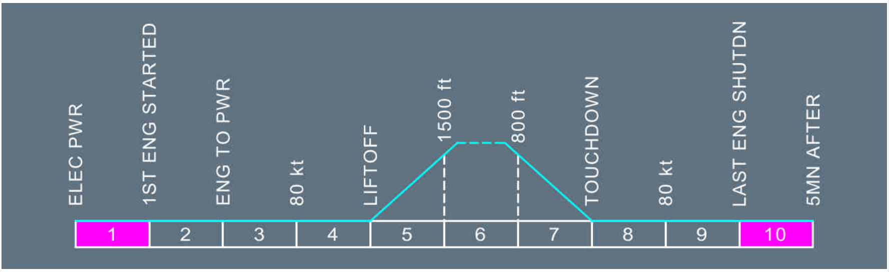
Ident.: PRO-ABN-ENG-CA-00018248.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the oil pressure is lower than 25 PSI.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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5
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8
9
10

Ident.: PRO-ABN-ENG-CA-00018616.0003001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE)...IDLE

- **IF WARNING PERSISTS:**
  ENG MASTER (AFFECTED ENGINE)..OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN)

ENG 1(2) OIL LO TEMP

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

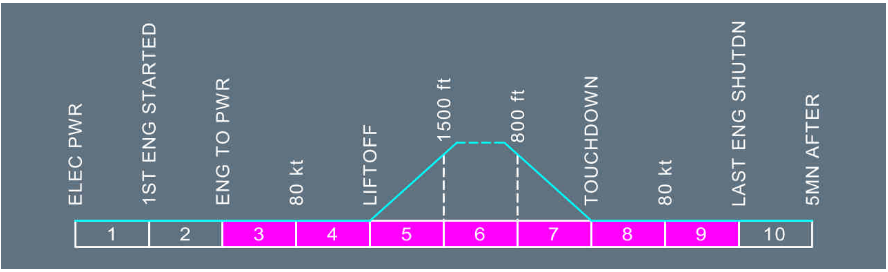
Ident.: PRO-ABN-ENG-CC-00018254.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine oil temperature is lower than -10 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
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Ident.: PRO-ABN-ENG-CC-00018621.0001001 / 04 SEP 17

THR LEVER (AFFECTED ENGINE)..IDLE
DELAY T.O. FOR WARM UP

ENG 1(2) OIL LO TEMP

Applicable to: LV-KHT, LV-KHU

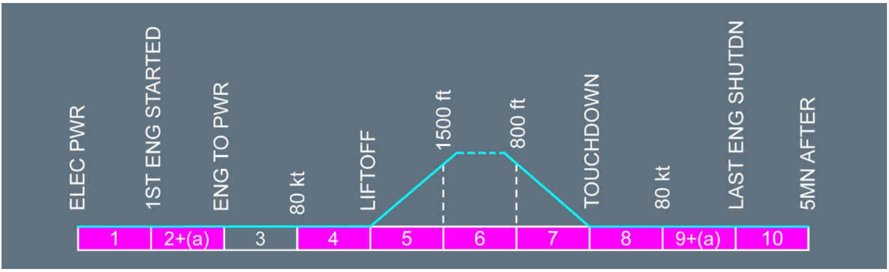
Ident.: PRO-ABN-ENG-CC-00018254.0003001 / 05 MAR 19

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine oil temperature is lower than 20 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2+(a)
3
4
5
6
7
8
9+(a)
10

Note: *(a) In phases 2 and 9, the warning will not be triggered, unless the T.O CONFIG pb is pressed.*

Ident.: PRO-ABN-ENG-CC-00018621.0001001 / 04 SEP 17

THR LEVER (AFFECTED ENGINE)..IDLE
DELAY T.O. FOR WARM UP

ENG 1(2) OVSPD PROT FAULT

Applicable to: LV-KHT, LV-KHU

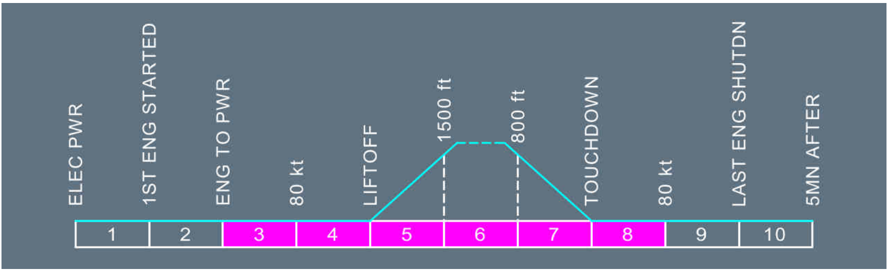
Ident.: PRO-ABN-ENG-CF-00018260.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the overspeed protection system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
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Ident.: PRO-ABN-ENG-CF-00018624.0003001 / 25 JAN 18

L2 Maintenance action is due. In coordination with Maintenance support, a second engine start may be performed. If there is no failure message after this second attempt, it could be considered as spurious.

L1 Crew awareness.

ENG 1(2) REV FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

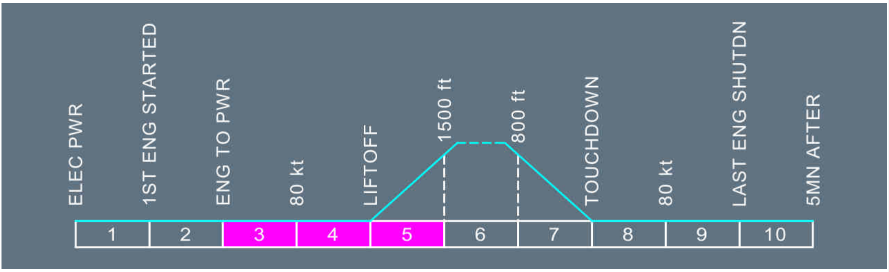
Ident.: PRO-ABN-ENG-U-00018264.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the thrust reverser on one engine is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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8
9
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Ident.: PRO-ABN-ENG-U-00018654.0002001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ENG-U-00011735.0005001 / 07 JUL 20

STATUS

LDG DIST PROC.. APPLY

INOP SYS

REV 1(2)

ENG 1(2) REV FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO

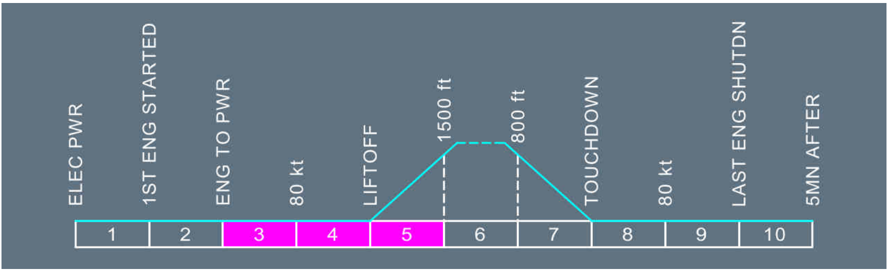
Ident.: PRO-ABN-ENG-U-00018264.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the thrust reverser on one engine is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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4
5
6
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8
9
10

Ident.: PRO-ABN-ENG-U-00018654.0002001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ENG-U-00011735.0002001 / 18 AUG 10

STATUS

INOP SYS

REV 1(2)

ENG 1(2) REV FAULT

Applicable to: LV-KHT

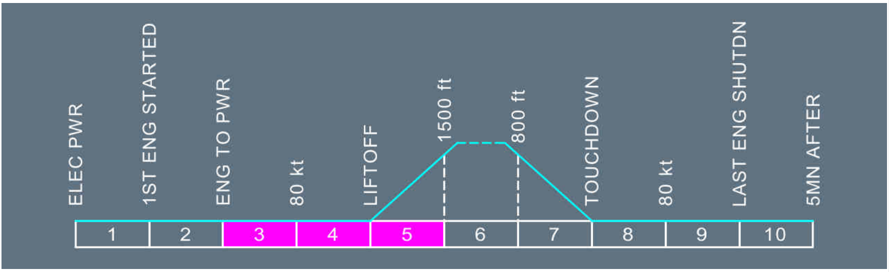
Ident.: PRO-ABN-ENG-U-00018264.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the thrust reverser on one engine is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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8
9
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Ident.: PRO-ABN-ENG-U-00018654.0003001 / 21 MAR 16

- **If IDLE is automatically selected by the FADEC:**
  ENG (AFFECTED) AT IDLE

THR LEVER (AFFECTED ENGINE)..IDLE

L2 *Select thrust lever at idle, even if idle is automatically selected by the FADEC.*

Ident.: PRO-ABN-ENG-U-00011735.0004001 / 07 JUL 20

STATUS

	INOP SYS
● **If IDLE is automatically selected by the FADEC:** ENG (AFFECTED) AT IDLE ● **For aircraft equipped with GA SOFT:** ◁ GA THR: TOGA ONLY LDG DIST PROC.. APPLY	REV 1(2) GA SOFT ◁

ENG 1(2) REV FAULT

Applicable to: LV-KHU

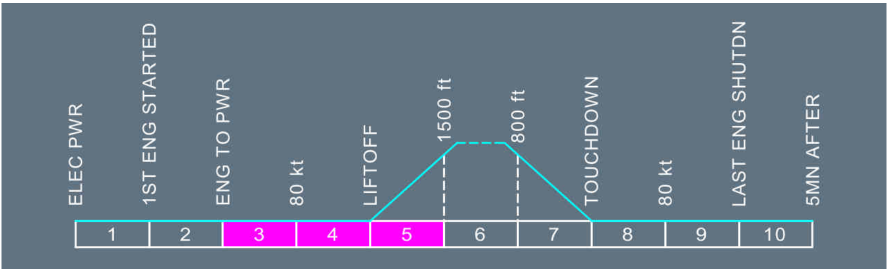
Ident.: PRO-ABN-ENG-U-00018264.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the thrust reverser on one engine is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-U-00018654.0003001 / 21 MAR 16

- **If IDLE is automatically selected by the FADEC:**
  ENG (AFFECTED) AT IDLE

THR LEVER (AFFECTED ENGINE)..IDLE

L2 *Select thrust lever at idle, even if idle is automatically selected by the FADEC.*

Ident.: PRO-ABN-ENG-U-00011735.0003001 / 12 JUL 18

STATUS

- **If IDLE is automatically selected by the FADEC:**
  ENG (AFFECTED ENGINE) AT IDLE
  - **For aircraft equipped with GA SOFT:** ◁
    GA THR: TOGA ONLY

INOP SYS

REV 1(2)
GA SOFT ◁

ENG 1(2) REV INHIBITED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

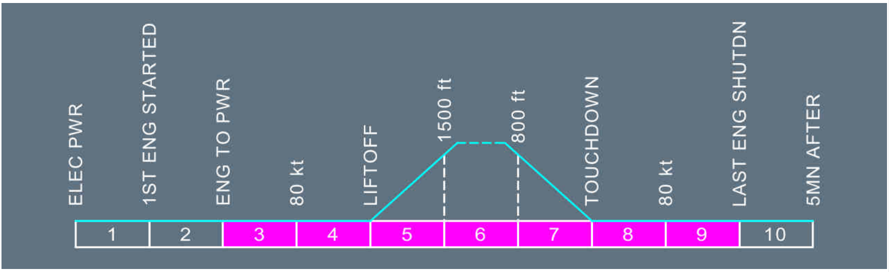
Ident.: PRO-ABN-ENG-T-00018268.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reverser is inhibited by maintenance action.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ENG-T-00018657.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ENG-T-00011731.0002001 / 07 JUL 20

STATUS

	INOP SYS
LDG DIST PROC.. APPLY	REV 1(2)

ENG 1(2) REV INHIBITED

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

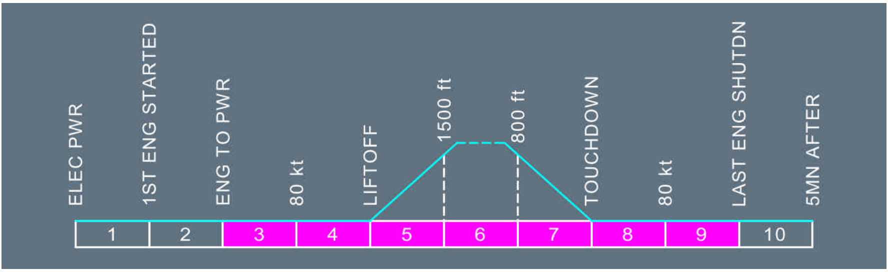
Ident.: PRO-ABN-ENG-T-00018268.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reverser is inhibited by maintenance action.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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8
9
10

Ident.: PRO-ABN-ENG-T-00018657.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-ENG-T-00011731.0001001 / 18 AUG 10

STATUS

INOP SYS

REV 1(2)

ENG 1(2) REV PRESSURIZED

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

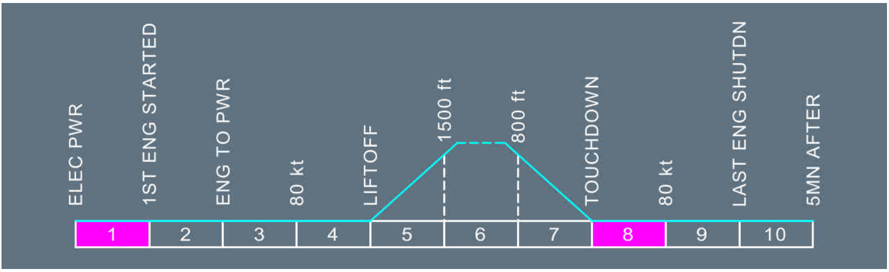
Ident.: PRO-ABN-ENG-CI-00018279.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reverser system is pressurized, while reverser cowls are stowed and locked, with no deploy order (on ground).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ENG-CI-00018643.0001001 / 21 MAR 16

- **If IDLE automatically selected by FADEC:**

  ENG (AFFECTED) AT IDLE

  L2 *Displayed only for aircraft equipped with GE engines.*

  L1 THR LEVER (AFFECTED ENGINE).. IDLE

  L2 *Select thrust lever at idle, even if idle is automatically selected by the FADEC.*

Continued on the following page

ENG 1(2) REV PRESSURIZED (Cont'd)

Ident.: PRO-ABN-ENG-CI-00022186.0003001 / 12 JUL 18

STATUS

- **If IDLE is automatically selected by the FADEC:**
  ENG (AFFECTED ENGINE) AT IDLE
  - **For aircraft equipped with GA SOFT:** ◁
    GA THR: TOGA ONLY

INOP SYS

GA SOFT ◁ (1)

(1) *(If IDLE is automatically selected by the FADEC)*

ENG 1(2) REV PRESSURIZED

Applicable to: LV-KHT, LV-KHU

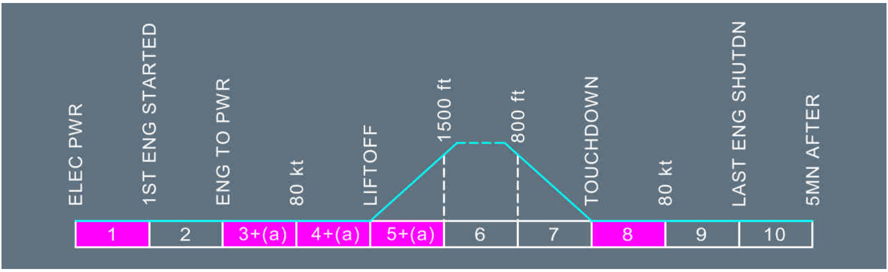
Ident.: PRO-ABN-ENG-CI-00018279.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reverser system is pressurized, while reverser cowls are stowed and locked, with no deploy order (on ground).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3+(a)
4+(a)
5+(a)
6
7
8
9
10

Note: *(a) Alert inhibited in flight phases 3, 4, and 5 when ENG T/R third lock is not open.*

Continued on the following page

ENG 1(2) REV PRESSURIZED (Cont'd)

Ident.: PRO-ABN-ENG-CI-00018643.0001001 / 21 MAR 16

- **If IDLE automatically selected by FADEC:**

  ENG (AFFECTED) AT IDLE

  L2 *Displayed only for aircraft equipped with GE engines.*

  L1 THR LEVER (AFFECTED ENGINE).. IDLE

  L2 *Select thrust lever at idle, even if idle is automatically selected by the FADEC.*

ENG 1(2) REV SET

Applicable to: ALL

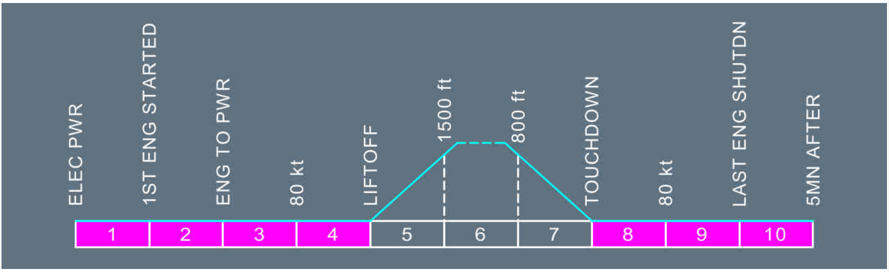
Ident.: PRO-ABN-ENG-CK-00018281.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reverse thrust is selected by the crew in flight.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ENG-CK-00018645.0001001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE).. FWD THR

ENG 1(2) REV UNLOCKED

Applicable to: ALL

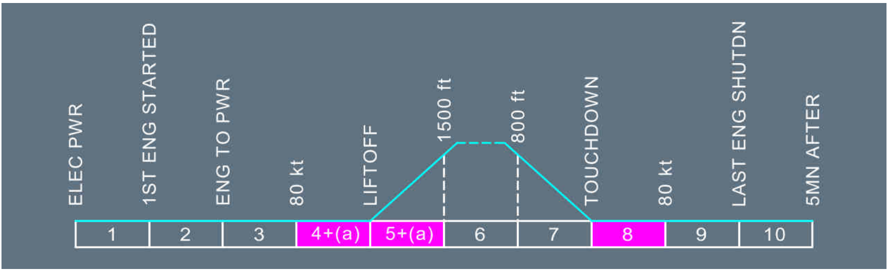
Ident.: PRO-ABN-ENG-W-00018283.0001001 / 26 NOV 19

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one reverser cowl is not locked in stowed position, with no deploy order.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
8
9
10

Other Inhibition:

(a) The alert is inhibited in the flight phase 4 and for the first 15 s of flight phase 5, except if the engine thrust is automatically set to idle.

Continued on the following page

ENG 1(2) REV UNLOCKED (Cont'd)

Ident.: PRO-ABN-ENG-W-00011742.0001001 / 04 SEP 17

- **On ground:**

  ENG (AFFECTED) AT IDLE

L2 *Displayed only if engine is automatically set at idle.*

L1 THR LEVER (AFFECTED ENGINE).................... IDLE

L2 *Select thrust lever at idle, even if idle is automatically selected by the FADEC.*

L1
- **In flight:**

  MAX SPEED.................... 300/.82

  ENG (AFFECTED) AT IDLE

L2 *Displayed only if engine is automatically set at idle.*

L1 THR LEVER (AFFECTED ENGINE).................... IDLE

L2 *Select thrust lever at idle, even if idle is automatically selected by the FADEC.*

L1
  - **IF BUFFET:**

    MAX SPEED....................250/.70

    ENG MASTER (AFFECTED ENGINE)....................OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN

Note: 1. *Lateral control (up to the equivalent of ½ stick) will be applied by the normal lateral law and thus spoilers will be extended and large aileron deflection will be used. However adequate roll control remains.*
2. *Do not follow beta and beta target.*
Apply full rudder and rudder trim towards the running engines.

Continued on the following page

ENG 1(2) REV UNLOCKED (Cont'd)

Ident.: PRO-ABN-ENG-W-00018662.0006001 / 21 MAR 17

L12

STATUS

MAX SPEED.. 300/.82

- **IF BUFFET:**

  MAX SPEED..250/.70

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- **IF BUFFET:**

  GPWS FLAP MODE...OFF

  FOR LDG...USE FLAP 2

  This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

  APPR SPD...VLS + 15 KTS

LDG DIST PROC... APPLY

FUEL UNBALANCE.. MONITOR

- **If IDLE automatically selected by FADEC:**

  ENG 1(2) AT IDLE
- **If ENG 1 shutdown:**

  SLATS SLOW

  CAT 3 SINGLE ONLY
- **If ENG 2 shutdown:**

  FLAPS SLOW

  CAT 3 SINGLE ONLY

Note: *The approach speed of VLS +15 kt is recommended, both to increase lateral control and to maintain the approach angle-of-attack at a reasonable value. Note that a reduction in lift may result from this failure and, therefore, a higher angle-of-attack than normal may be advised at a given speed.*

ENG 1(2) SENSOR FAULT

Applicable to: LV-KHT

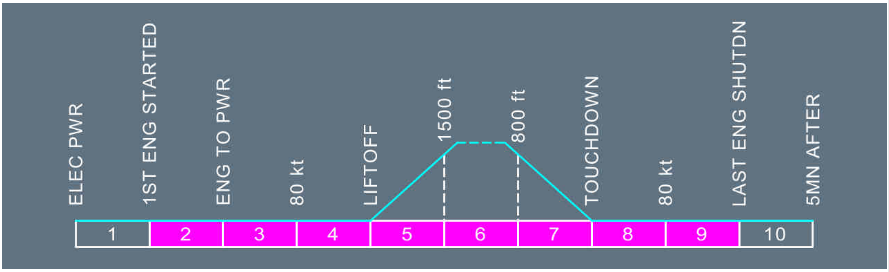
Ident.: PRO-ABN-ENG-CM-00018308.0003001 / 04 SEP 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FADEC is not able to measure the temperature in engine zone 1 (fan zone).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-ENG-CM-00018664.0004001 / 04 SEP 17

Crew awareness.

ENG 1(2) SENSOR FAULT

Applicable to: LV-KHU

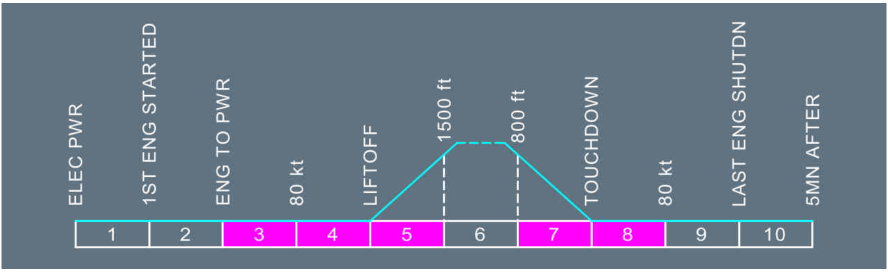
Ident.: PRO-ABN-ENG-CM-00018308.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the T30 sensor is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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4
5
6
7
8
9
10

Ident.: PRO-ABN-ENG-CM-00018664.0003001 / 21 MAR 16

HI IDLE

ENG 1(2) SHUT DOWN

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

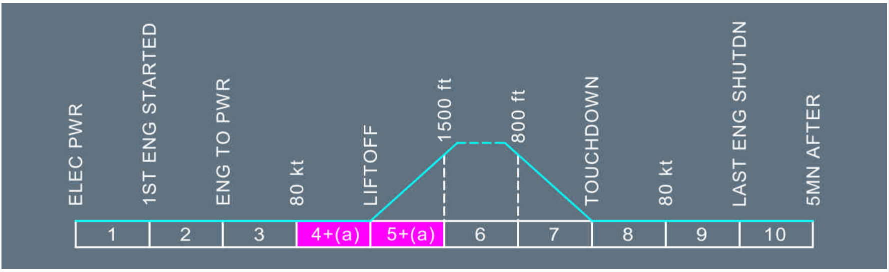
Ident.: PRO-ABN-ENG-B-00018317.0002001 / 06 SEP 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ENG 1(2) is shut down.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
8
9
10

Note: *(a) Inhibited between V1 and lift-off + 15 s.*

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-ENG-B-00018665.0003001 / 27 OCT 16

LAND ASAP

ENG START SEL..........IGN

L2 *Continuous ignition is selected to protect the remaining engine.*

Note: If the Y ELEC PUMP is running after ENG 2 failure (engine failure before flaps retraction), SWITCH OFF the pump when in clean configuration.

L1 L/G..........UP

L2 *This line is displayed in flight, during the T/O phase.*

L1 FUEL IMBALANCE..........MONITOR

L2 *The FUEL IMBALANCE ...... MONITOR action line is not displayed in the case of an engine feed line burst.*

Note: If engine windmilling induces transient HYD SYS LO PR warnings, it is recommended that flight crew switch OFF the hydraulic pumps associated with the failed engine. Procedure only applicable when engine will not be restarted.

L1 TCAS MODE SEL..........TA

SECONDARY FAILURES

* ELEC
* HYD

L2 *Note: In some conditions, with full asymmetric power, the aircraft may be control-limited before reaching the limits of the protection system. Therefore, in extreme conditions, where low speed may be advantageous (GPWS, WINDSHEAR, etc), reduce speed with care below VLS and respect the minimum control speed.*

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open), or
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-ENG-B-00018666.0006001 / 12 JUL 18

L12

STATUS

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY

FUEL IMBALANCE.. MONITOR

- **IF NO FUEL LEAK:**
  L+R INR TK SPLIT.. OFF
- **If engine feed line rupture**
  - **IF L(R) TK FUEL RQRD:**
    OUTR TK XFR.. ON
    STRAIGHT FLT.. MAINTAIN
    AP.. OFF
    BANK ANGLE..........................3 DEG RIGHT (LEFT)
    USE L(R) RUD TO KEEP HDG
    RUD TRIM.. AS NECESSARY
    - **WHEN FUEL XFRD:**
      OUTR TK XFR.. AUTO
      NORM ROLL ATT.. RETURN
      RUD TRIM.. NORMAL USE
      AP ON..AS RQRD

APPR PROC

- **BEFORE S/F EXTENSION:**
  - **If ENG 1 S/D and green hyd lost:**
    BLUE ELEC PUMP .... OFF
  - **If ENG 2 S/D and green hyd lost:**
    YELLOW ELEC PUMP.. OFF

FOR LDG .... USE FLAP 3

This line is replaced by “FOR LDG: USE FLAP 3” when CONF 3 is selected, as a reminder

INOP SYS

BLUE HYD (YELLOW HYD)
PART SPLRS
REV 1(2)
CAT 3 DUAL
ENG 1(2) BLEED
PACK 1(2)
G ENG 1(2) PUMP
B ENG 1 PUMP (Y ENG 2 PUMP)
GEN 1 (2)
ALTN BRK [1]
PART GALLEY
GA SOFT ◁

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

LDG DIST PROC.. APPLY

CONSIDER APU GEN USE

- **If ENG 1 shutdown:**
  SLATS SLOW
- **If ENG 2 shutdown:**
  FLAPS SLOW

CAT 3 SINGLE ONLY

See (2)

---

(1) *(If ENG 1 shutdown)*

(2) *If one ENG FIRE pb-sw has been pressed, the A/THR may be inoperative for RR and PW engines. Therefore, landing capability is degraded to CAT 2.*

ENG 1(2) SHUT DOWN

Applicable to: LV-KHT, LV-KHU

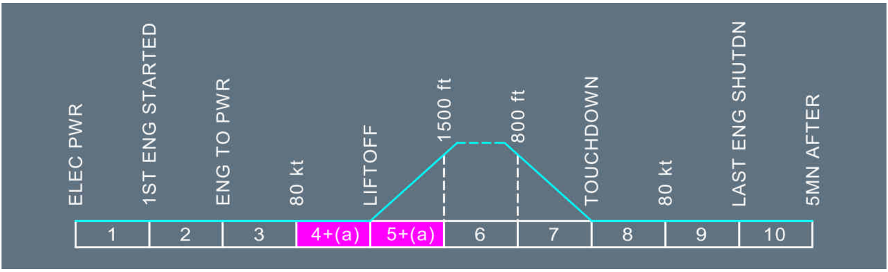
Ident.: PRO-ABN-ENG-B-00018317.0002001 / 06 SEP 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ENG 1(2) is shut down.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
8
9
10

Note: *(a) Inhibited between V1 and lift-off + 15 s.*

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-ENG-B-00018665.0003001 / 27 OCT 16

LAND ASAP

ENG START SEL...IGN

L2 *Continuous ignition is selected to protect the remaining engine.*

Note: If the Y ELEC PUMP is running after ENG 2 failure (engine failure before flaps retraction), SWITCH OFF the pump when in clean configuration.

L1 L/G... UP

L2 *This line is displayed in flight, during the T/O phase.*

L1 FUEL IMBALANCE...MONITOR

L2 *The FUEL IMBALANCE ...... MONITOR action line is not displayed in the case of an engine feed line burst.*

Note: If engine windmilling induces transient HYD SYS LO PR warnings, it is recommended that flight crew switch OFF the hydraulic pumps associated with the failed engine. Procedure only applicable when engine will not be restarted.

L1 TCAS MODE SEL ◁ .... TA

SECONDARY FAILURES

* ELEC
* HYD

L2 *Note: In some conditions, with full asymmetric power, the aircraft may be control-limited before reaching the limits of the protection system. Therefore, in extreme conditions, where low speed may be advantageous (GPWS, WINDSHEAR, etc), reduce speed with care below VLS and respect the minimum control speed.*

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open), or
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

Ident.: PRO-ABN-ENG-B-00018666.0009001 / 12 JUL 18

L12

STATUS

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY

FUEL IMBALANCE.. MONITOR

- **IF NO FUEL LEAK:**
  L+R INR TK SPLIT.. OFF

- **If engine feed line rupture**
  - **IF L(R) TK FUEL RQRD:**
    OUTR TK XFR.. ON
    STRAIGHT FLT.. MAINTAIN
    AP.. OFF
    BANK ANGLE..3 DEG RIGHT (LEFT)
    USE L(R) RUD TO KEEP HDG
    RUD TRIM.. AS NECESSARY
    - **WHEN FUEL XFRD:**
      OUTR TK XFR.. AUTO
      NORM ROLL ATT.. RETURN
      RUD TRIM.. NORMAL USE
      AP ON..AS RQRD

APPR PROC

- **BEFORE S/F EXTENSION:**
  - **If ENG 1 S/D and green hyd lost:**
    BLUE ELEC PUMP .... OFF
  - **If ENG 2 S/D and green hyd lost:**
    YELLOW ELEC PUMP.. OFF

FOR LDG ....USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder

INOP SYS

BLUE HYD (YELLOW HYD)
PART SPLRS
REV 1(2)
CAT 3 DUAL
ENG 1(2) BLEED
PACK 1(2)
G ENG 1(2) PUMP
B ENG 1 PUMP (Y ENG 2 PUMP)
GEN 1 (2)
ALTN BRK (1)
PART GALLEY
GA SOFT ◁

Continued on the following page

ENG 1(2) SHUT DOWN (Cont'd)

LDG DIST PROC.. APPLY

CONSIDER APU GEN USE

- **If ENG 1 shutdown:**
  SLATS SLOW
- **If ENG 2 shutdown:**
  FLAPS SLOW

CAT 3 SINGLE ONLY

(1) *(If ENG 1 shutdown)*

ENG 1(2) STALL

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

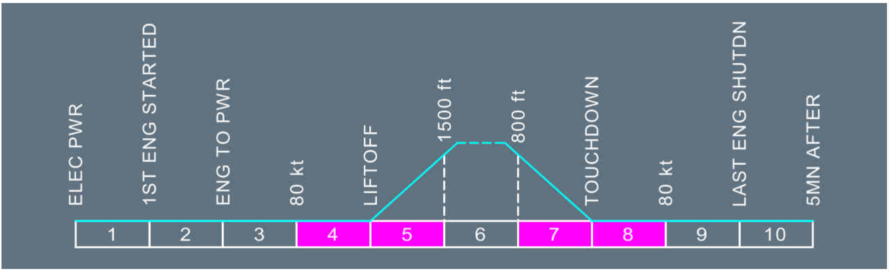
Ident.: PRO-ABN-ENG-CN-00018325.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when an engine stall is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) STALL (Cont'd)

Ident.: PRO-ABN-ENG-CN-00018674.0003001 / 12 MAY 23

L2 A stall may be indicated by varying degrees of abnormal engine noises, accompanied by flame from the engine exhaust (and possibly from engine inlet in severe cases), fluctuating parameters, sluggish or no thrust lever response, high EGT and/or a rapid EGT rise when thrust lever is advanced. Engine stalls must be reported for maintenance action.

L1
- ■ **If stall detected by FADEC:**
  - ■ **In flight:**
    - ● **For aircraft equipped with RR engines:**

      FUEL ADJUSTED

      L2 *Fuel/Air ratio is automatically decreased until the stall disappears.*

    L1 THR LEVER (AFFECTED ENGINE)........IDLE

    ENG PARAMETERS (AFFECTED ENGINE)........CHECK
    - ● **If abnormal ENG parameters:**

      ENG MASTER (AFFECTED ENGINE)........OFF

      ASSOCIATED PROCEDURES

      ENG 1(2) SHUT DOWN

      Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN.
  - ■ **On ground:**

    THR LEVER (AFFECTED ENGINE)........IDLE

    ENG MASTER (AFFECTED ENGINE)........OFF
- ■ **If stall detected before the ECAM activation:**

  Refer to PRO-ABN-ENG [QRH] ENG STALL.

ENG START FAULT

Applicable to: ALL

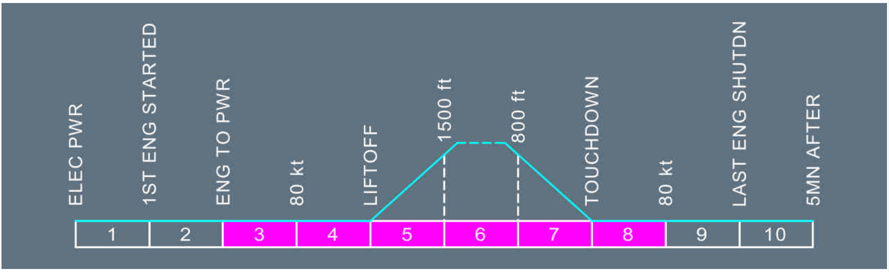
Ident.: PRO-ABN-ENG-CP-00018327.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when all thrust levers are not at idle during engine start.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-CP-00018676.0001001 / 21 MAR 16

THR LEVERS NOT AT IDLE

THR LEVERS.. IDLE

ENG 1(2) START FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

Ident.: PRO-ABN-ENG-CQ-00018368.0001001 / 21 MAR 16

ANNUNCIATIONS

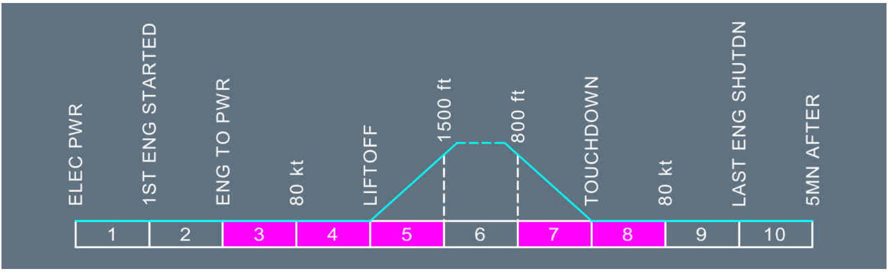
Triggering Conditions:

L2

This alert triggers when one of the following conditions is detected:

- Starter time exceeded, or
- Stall, or
- EGT overlimit, or
- No light up, or
- Low N1, or
- Starter failure, or
- Hung start, or
- High tailwind start, or
- THR levers not at idle.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CQ-00018677.0004001 / 12 JUL 18

■ LOW N1 (On Ground):

L2 No N1 rotation during start.

L1 THR LEVER (AFFECTED ENGINE)........ IDLE
MAN START (AFFECTED ENGINE)........OFF
ENG MASTER (AFFECTED ENGINE)........OFF

■ ENG STALL or EGT OVERLIMIT or NO LIGHT UP:

- **In flight:**

  ENG MASTER (AFFECTED ENGINE)........OFF

  L2 *Wait 30 s before a new start attempt (to drain the engine).*

L1
- **On ground (auto start):**

  L2 Following message is displayed on ECAM:

  L1 NEW START IN PROGRESS

  L2 *If start is unsuccessful, the fuel valve is closed.*

L1
- **If start still unsuccessful:**

  ENG MASTER (AFFECTED ENGINE)........OFF

  L2 *Fuel metering valve and starter air valve are automatically closed. Both igniters are turned off. In case of stall consider X BLEED start if pressure is low.*

L1
- **On ground (manual start):**

  MAN START (AFFECTED ENGINE)........OFF
  ENG MASTER (AFFECTED ENGINE)........OFF
  ENG START SEL........ CRANK
  MAN START........ ON

  L2 Note: *ECAM does not display the two last lines of the above procedure. The pilot must decide whether to attempt a new start or report the no start condition for appropriate maintenance condition.*

  Dry crank the engine for 30 s.

  The start valve reopens automatically when:
  - *N2 below 15 % for aircraft equipped with GE engines, or*
  - *N3 below 10 % for aircraft equipped with RR engines.*

Continued on the following page

ENG 1(2) START FAULT (Cont'd)

L1 ■ **STARTER FAULT or STARTER TIME EXCEEDED:**

MAN START (AFFECTED ENGINE).....OFF
ENG MASTER (AFFECTED ENGINE).....OFF

ENG 1(2) START FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO

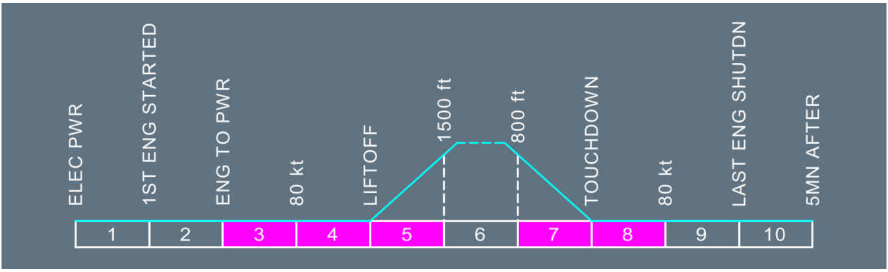
Ident.: PRO-ABN-ENG-CQ-00018368.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one of the following conditions is detected:
- Starter time exceeded, or
- Stall, or
- EGT overlimit, or
- No light up, or
- Low N1, or
- Starter failure, or
- Hung start, or
- High tailwind start, or
- THR levers not at idle.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CQ-00018677.0001001 / 21 MAR 16

■ LOW N1 (On Ground):

L2 No N1 rotation during start.

L1 THR LEVER (AFFECTED ENGINE).. IDLE
ENG MASTER (AFFECTED ENGINE)..OFF

■ ENG STALL or EGT OVERLIMIT or NO LIGHT UP:

- **In flight:**

  ENG MASTER (AFFECTED ENGINE)..OFF

  L2 *Wait 30 s before a new start attempt (to drain the engine).*

- L1 **On ground (auto start):**

  L2 Following message is displayed on ECAM:

  L1 NEW START IN PROGRESS

  L2 *If start is unsuccessful, the fuel valve is closed.*

- L1 **If start still unsuccessful:**

  ENG MASTER (AFFECTED ENGINE)..OFF

  L2 *Fuel metering valve and starter air valve are automatically closed. Both igniters are turned off. In case of stall consider X BLEED start if pressure is low.*

- L1 **On ground (manual start):**

  MAN START (AFFECTED ENGINE)..OFF
  ENG MASTER (AFFECTED ENGINE)..OFF
  ENG START SEL.. CRANK
  MAN START.. ON

  L2 Note: *ECAM does not display the two last lines of the above procedure. The pilot must decide whether to attempt a new start or report the no start condition for appropriate maintenance condition.*

  Dry crank the engine for 30 s.

  The start valve reopens automatically when:
  - *N2 below 15 % for aircraft equipped with GE engines, or*
  - *N3 below 10 % for aircraft equipped with RR engines.*

Continued on the following page

ENG 1(2) START FAULT (Cont'd)

L1 ■ **STARTER FAULT or STARTER TIME EXCEEDED:**

ENG MASTER (AFFECTED ENGINE)..........OFF
MAN START (AFFECTED ENGINE)..........OFF

ENG 1(2) START FAULT

Applicable to: LV-KHT

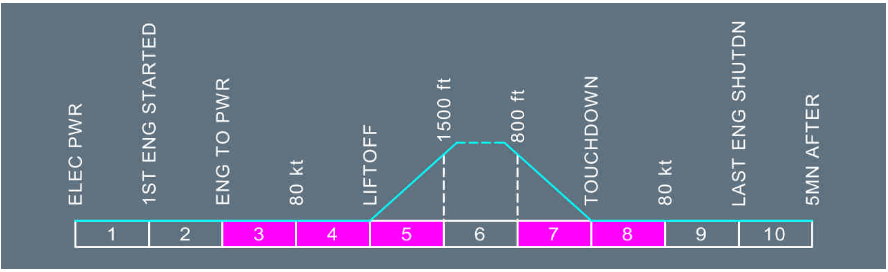
Ident.: PRO-ABN-ENG-CQ-00018368.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one of the following conditions is detected:
- Starter time exceeded, or
- Stall, or
- EGT overlimit, or
- No light up, or
- Low N1, or
- THR levers not at idle.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CQ-00018677.0004001 / 12 JUL 18

■ LOW N1 (On Ground):

L2 No N1 rotation during start.

L1 THR LEVER (AFFECTED ENGINE)........ IDLE
MAN START (AFFECTED ENGINE)........OFF
ENG MASTER (AFFECTED ENGINE)........OFF

■ ENG STALL or EGT OVERLIMIT or NO LIGHT UP:

- **In flight:**

  ENG MASTER (AFFECTED ENGINE)........OFF

  L2 *Wait 30 s before a new start attempt (to drain the engine).*

- L1 **On ground (auto start):**

  L2 Following message is displayed on ECAM:

  L1 NEW START IN PROGRESS

  L2 *If start is unsuccessful, the fuel valve is closed.*

- L1 **If start still unsuccessful:**

  ENG MASTER (AFFECTED ENGINE)........OFF

  L2 *Fuel metering valve and starter air valve are automatically closed. Both igniters are turned off. In case of stall consider X BLEED start if pressure is low.*

- L1 **On ground (manual start):**

  MAN START (AFFECTED ENGINE)........OFF
  ENG MASTER (AFFECTED ENGINE)........OFF
  ENG START SEL........ CRANK
  MAN START........ ON

  L2 Note: *ECAM does not display the two last lines of the above procedure. The pilot must decide whether to attempt a new start or report the no start condition for appropriate maintenance condition.*

  Dry crank the engine for 30 s.

  The start valve reopens automatically when:
  - *N2 below 15 % for aircraft equipped with GE engines, or*
  - *N3 below 10 % for aircraft equipped with RR engines.*

Continued on the following page

ENG 1(2) START FAULT (Cont'd)

L1 ■ **STARTER FAULT or STARTER TIME EXCEEDED:**

MAN START (AFFECTED ENGINE)....................OFF
ENG MASTER (AFFECTED ENGINE)....................OFF

ENG 1(2) START FAULT

Applicable to: LV-KHU

Ident.: PRO-ABN-ENG-CQ-00018368.0003001 / 21 MAR 16

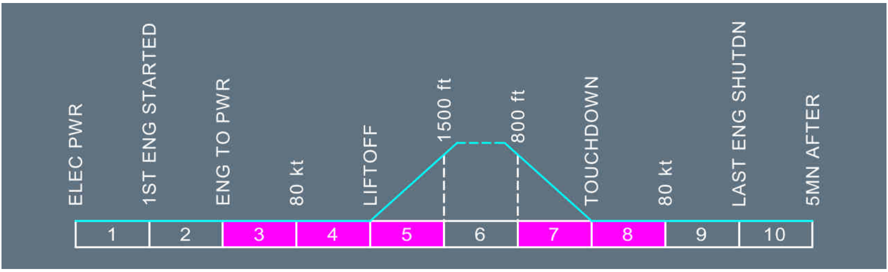
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one of the following conditions is detected:

- Starter time exceeded, or
- Stall, or
- EGT overlimit, or
- No light up, or
- Low N1, or
- THR levers not at idle.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CQ-00018677.0001001 / 21 MAR 16

■ LOW N1 (On Ground):

L2 No N1 rotation during start.

L1 THR LEVER (AFFECTED ENGINE)........................ IDLE
ENG MASTER (AFFECTED ENGINE)........................OFF

■ ENG STALL or EGT OVERLIMIT or NO LIGHT UP:

- **In flight:**

  ENG MASTER (AFFECTED ENGINE)........................OFF

  L2 *Wait 30 s before a new start attempt (to drain the engine).*

- L1 **On ground (auto start):**

  L2 Following message is displayed on ECAM:

  L1 NEW START IN PROGRESS

  L2 *If start is unsuccessful, the fuel valve is closed.*

- L1 **If start still unsuccessful:**

  ENG MASTER (AFFECTED ENGINE)........................OFF

  L2 *Fuel metering valve and starter air valve are automatically closed. Both igniters are turned off. In case of stall consider X BLEED start if pressure is low.*

- L1 **On ground (manual start):**

  MAN START (AFFECTED ENGINE)........................OFF
  ENG MASTER (AFFECTED ENGINE)........................OFF
  ENG START SEL........................ CRANK
  MAN START........................ ON

  L2 *Note:* *ECAM does not display the two last lines of the above procedure. The pilot must decide whether to attempt a new start or report the no start condition for appropriate maintenance condition.*

  Dry crank the engine for 30 s.

  The start valve reopens automatically when:
  - *N2 below 15 % for aircraft equipped with GE engines, or*
  - *N3 below 10 % for aircraft equipped with RR engines.*

Continued on the following page

ENG 1(2) START FAULT (Cont'd)

L1 ■ **STARTER FAULT or STARTER TIME EXCEEDED:**

ENG MASTER (AFFECTED ENGINE)....................OFF

MAN START (AFFECTED ENGINE)....................OFF

ENG 1(2) START VALVE FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

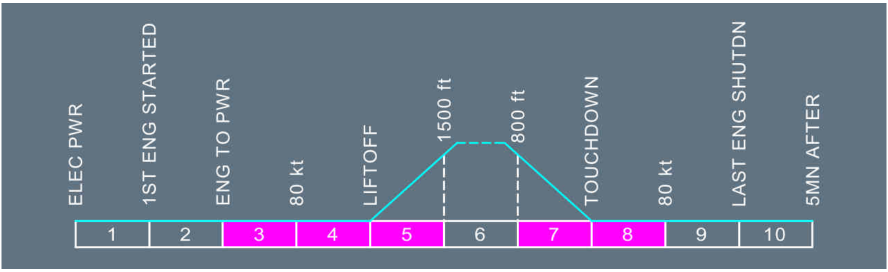
Ident.: PRO-ABN-ENG-CS-00018374.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the start valve is jammed (in closed or open position), or no starter air pressure is available.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CS-00011777.0006001 / 03 NOV 22

START VALVE STUCK CLOSED

L2 The valve is mechanically stuck closed.

L1 **On ground:**

- **If a manual start is performed:**
  MAN START (AFFECTED ENGINE)....OFF

ENG MASTER (AFFECTED ENGINE)....OFF

L2 *In the case of automatic start, the flight crew can attempt up to 4 additional automatic starts on top of the initial start attempt. If automatic start is not successful, consider application of the "START VALVE MANUAL OPERATION" procedure (Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation).*

L1 **In flight:**

WINDMILL START ONLY

START VALVE NOT OPEN

- **If the opposite engine is running or if the APU is available when the right side is affected:**
  X BLEED....OPEN
- **If the APU is available below FL 220 and the opposite engine is not running:**
  APU BLEED....ON

WINDMILL START AVAIL (IN FLIGHT ONLY)

- **IF UNSUCCESSFUL:**
  - **If a manual start is performed:**
    MAN START (AFFECTED ENGINE)....OFF

  ENG MASTER (AFFECTED ENGINE)....OFF

START VALVE NOT CLOSED

L2 Remove all bleed sources supplying the faulty starter valve.

L1
- **If the left side is affected:**
  APU BLEED....OFF
- **If the opposite engine is running or if the APU is available from the left side:**
  X BLEED....CLOSE

Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

ENG BLEED (AFFECTED SIDE)........OFF

- **On ground:**
  MAN START (AFFECTED ENGINE)........OFF
  ENG MASTER (AFFECTED ENGINE)........OFF

L2 *Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation.*

L1
- **In flight:**
  WING ANTI ICE........OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open)*, *or*
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

Ident.: PRO-ABN-ENG-CS-00024380.0002001 / 07 JUL 20

STATUS

- **In the case of START VALVE STUCK CLOSED:**
  - **In flight:**
    ENG (AFFECTED) WINDMILL START ONLY

ENG 1(2) START VALVE FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO

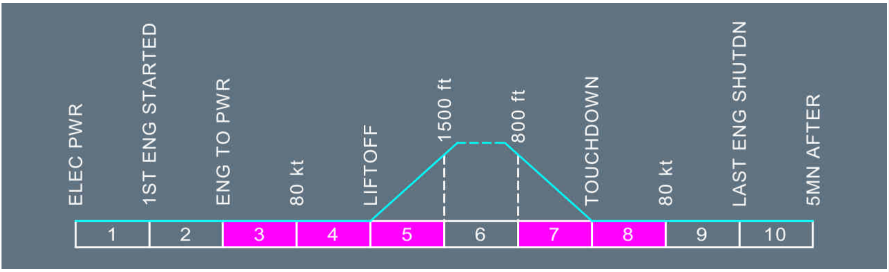
Ident.: PRO-ABN-ENG-CS-00018374.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the start valve is jammed (in closed or open position), or no starter air pressure is available.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CS-00011777.0005001 / 04 NOV 20

■ START VALVE STUCK CLOSED

L2 The valve is mechanically stuck closed.

L1
- **If a manual start is performed:**
  MAN START (AFFECTED ENGINE)....OFF

ENG MASTER (AFFECTED ENGINE)....OFF

L2 *On ground, in case of automatic start, the flight crew can attempt up to 4 additional automatic starts on top of the initial start attempt. If automatic start is not successful, consider application of the "START VALVE MANUAL OPERATION" procedure (Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation).*

L1

■ START VALVE NOT OPEN

WINDMILL START AVAIL (IN FLIGHT ONLY)

- **If the opposite engine is running or if the APU is available when the right side is affected:**
  X BLEED....OPEN
- **If the APU is available below FL 220 and the opposite engine is not running:**
  APU BLEED....ON
- **IF UNSUCCESSFUL:**
  MAN START (AFFECTED ENGINE)....OFF
  ENG MASTER (AFFECTED ENGINE)....OFF

■ START VALVE NOT CLOSED

L2 Remove all bleed sources supplying the faulty starter valve.

L1
- **If the left side is affected:**
  APU BLEED....OFF
- **If the opposite engine is running or if the APU is available from the left side:**
  X BLEED....CLOSE

ENG BLEED (AFFECTED SIDE)....OFF

- ■ **On ground:**
  MAN START (AFFECTED ENGINE)....OFF
  ENG MASTER (AFFECTED ENGINE)....OFF

L2 *Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation.*

Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

L1

- **In flight:**
  WING ANTI ICE...OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open), or*
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

ENG 1(2) START VALVE FAULT

Applicable to: LV-KHT

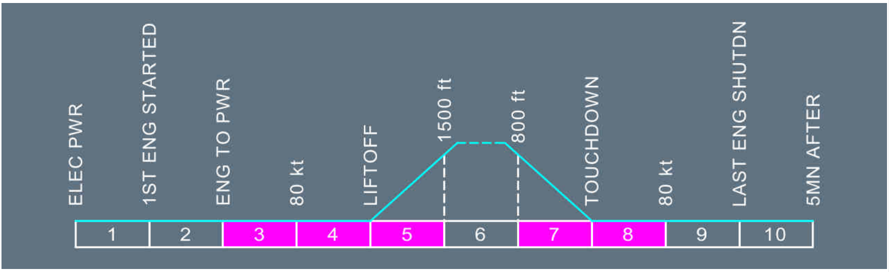
Ident.: PRO-ABN-ENG-CS-00018374.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the start valve is jammed (in closed or open position), or no starter air pressure is available.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CS-00011777.0003001 / 03 NOV 22

■ START VALVE STUCK CLOSED

L2 The valve is mechanically stuck closed.
On ground, *Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation*.

L1
- ■ **On ground:**
  - ● **If a manual start is performed:**
    MAN START (AFFECTED ENGINE)....OFF

  ENG MASTER (AFFECTED ENGINE)....OFF
- ■ **In flight:**
  WINDMILL START ONLY

■ START VALVE NOT OPEN

- ● **If the opposite engine is running or if the APU is available when the right side is affected:**
  X BLEED....OPEN
- ● **If the APU is available below FL 220 and the opposite engine is not running:**
  APU BLEED....ON

WINDMILL START AVAIL (IN FLIGHT ONLY)

- ● **IF UNSUCCESSFUL:**
  - ● **If a manual start is performed:**
    MAN START (AFFECTED ENGINE)....OFF

  ENG MASTER (AFFECTED ENGINE)....OFF

■ START VALVE NOT CLOSED

L2 Remove all bleed sources supplying the faulty starter valve.

L1
- ● **If the left side is affected:**
  APU BLEED....OFF
- ● **If the opposite engine is running or if the APU is available from the left side:**
  X BLEED....CLOSE

ENG BLEED (AFFECTED SIDE)....OFF

- ■ **On ground:**
  MAN START (AFFECTED ENGINE)....OFF

Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

ENG MASTER (AFFECTED ENGINE)..OFF

L2 *Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation.*

L1
- **In flight:**

  WING ANTI ICE..OFF

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open), or*
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

Ident.: PRO-ABN-ENG-CS-00024380.0002001 / 07 JUL 20

STATUS

- **In the case of START VALVE STUCK CLOSED:**
  - **In flight:**

    ENG (AFFECTED) WINDMILL START ONLY

ENG 1(2) START VALVE FAULT

Applicable to: LV-KHU

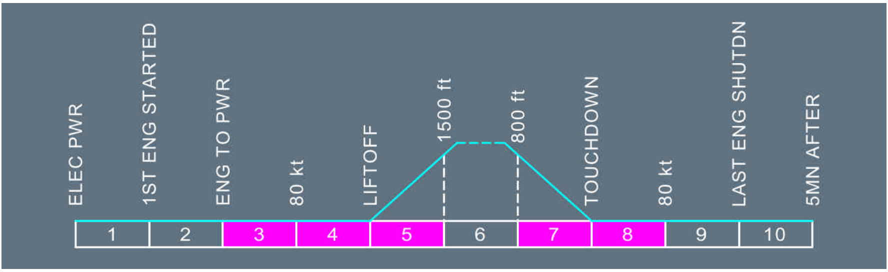
Ident.: PRO-ABN-ENG-CS-00018374.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the start valve is jammed (in closed or open position), or no starter air pressure is available.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

Ident.: PRO-ABN-ENG-CS-00011777.0001001 / 30 AUG 18

START VALVE STUCK CLOSED

L2 The valve is mechanically stuck closed.
On the ground, *Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation*.

L1
- **If a manual start is performed:**
  MAN START (AFFECTED ENGINE)....OFF

ENG MASTER (AFFECTED ENGINE)....OFF

START VALVE NOT OPEN

WINDMILL START AVAIL (IN FLIGHT ONLY)

- **If the opposite engine is running or if the APU is available when the right side is affected:**
  X BLEED....OPEN
- **If the APU is available below FL 220 and the opposite engine is not running:**
  APU BLEED....ON
- **IF UNSUCCESSFUL:**
  MAN START (AFFECTED ENGINE)....OFF
  ENG MASTER (AFFECTED ENGINE)....OFF

START VALVE NOT CLOSED

L2 Remove all bleed sources supplying the faulty starter valve.

L1
- **If the left side is affected:**
  APU BLEED....OFF
- **If the opposite engine is running or if the APU is available from the left side:**
  X BLEED....CLOSE

ENG BLEED (AFFECTED SIDE)....OFF

- **On ground:**
  MAN START (AFFECTED ENGINE)....OFF
  ENG MASTER (AFFECTED ENGINE)....OFF

L2 *Refer to PRO-NOR-SUP-ENG Engine Start Valve Manual Operation.*

L1
- **In flight:**
  WING ANTI ICE....OFF

Continued on the following page

ENG 1(2) START VALVE FAULT (Cont'd)

L12

ASSOCIATED PROCEDURES

AIR ABNORM BLEED CONFIG

L2 *Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Open)*, or
Refer to PRO-ABN-AIR AIR ABNORM BLEED CONFIG (X BLEED Closed)

ENG 1(2) THR LEVER ABV IDLE

Applicable to: ALL

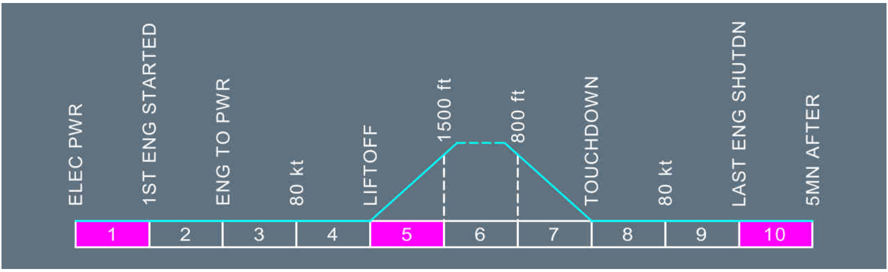
Ident.: PRO-ABN-ENG-CU-00018344.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:
- One thrust lever is above idle while the other thrust lever is in the reverse detent at landing.
- One thrust lever is above idle while the other thrust lever is at idle at landing.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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4
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9
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Ident.: PRO-ABN-ENG-CU-00018680.0003001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE)..IDLE

ENG 1(2) THR LEVER DISAGREE

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

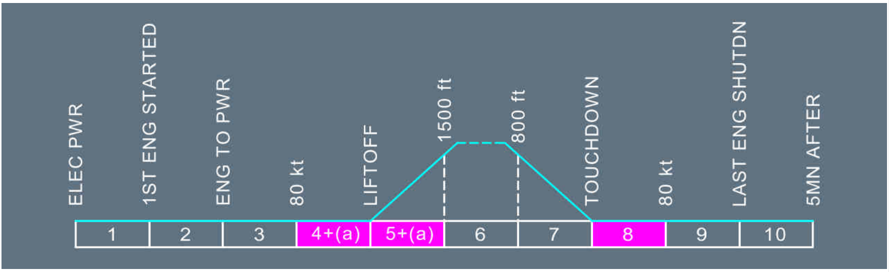
Ident.: PRO-ABN-ENG-AA-00018346.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a discrepancy between both resolvers of a thrust lever is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
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Note: Alert not inhibited in the flight phases 4 and 5, if the engine thrust is automatically set to idle.

Continued on the following page

ENG 1(2) THR LEVER DISAGREE (Cont'd)

L2 On ground: if the failure occurs while thrust lever is not in TOGA or FLX/MCT, FADEC selects idle.
During takeoff: if the failure occurs during takeoff (with thrust lever in TOGA or FLX/MCT), FADEC maintains T.O., FLEX TO, DRT TO ◁ thrust until thrust reduction, after which the maximum available thrust is CLB.
In flight: if the failure occurs in flight while thrust lever is between IDLE and MCT, FADEC selects the highest TLA limited to CLB. At landing gear extension, FADEC selects idle. In case of go-around, maximum available thrust is CLB when nose gear is retracted.

L1 **LAND ASAP**

- **On Ground:**

  ENG (AFFECTED) AT IDLE

  L2 *If thrust levers not in TOGA or FLX/MCT, FADEC selects idle power automatically.*

- L1 **In Flight:**

  MAX AVAIL PWR: CLB

  - **When L/G down:**

    ENG (AFFECTED) AT IDLE

    L2 *The FADEC automatically selects idle thrust*
    - *At landing gear extension, or*
    - *If affected EIVMU is failed when MN < 0.40 (for GE or RR), or MN < 0.33 (for PW).*

    In case of go-around, maximum available thrust is CLB when nose gear is retracted.

  - L1 **If A/THR is ON:**

    A/THR..KEEP ON

  - **If A/THR is not ON:**

    A/THR..ON

    L2 *With A/THR active, thrust is automatically managed between idle and the highest TLA position as long as the landing gear is up.*

Continued on the following page

ENG 1(2) THR LEVER DISAGREE (Cont'd)

Ident.: PRO-ABN-ENG-AA-00018698.0005001 / 28 MAY 18

L12

STATUS

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY
- **On ground:**
  ENG (AFFECTED) AT IDLE
- **In flight:**
  ENG (AFFECTED) MAX AVAIL PWR: CLB
  - **WHEN L/G DOWN:**
    ENG (AFFECTED) AT IDLE
  - **If EIVMU (affected) is failed:**
    - **WHEN MN < 0.4 (for GE or RR) or WHEN MN < 0.33 (for PW)**
      ENG (AFFECTED) AT IDLE

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by “FOR LDG: USE FLAP 3” when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

INOP SYS

ENG 1(2) THR LVR
GA SOFT ◁

ENG 1(2) THR LEVER DISAGREE

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

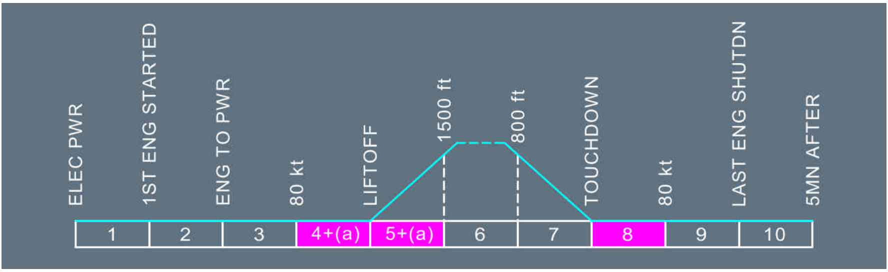
Ident.: PRO-ABN-ENG-AA-00018346.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a discrepancy between both resolvers of a thrust lever is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
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Note: *Alert not inhibited in the flight phases 4 and 5, if the engine thrust is automatically set to idle.*

Continued on the following page

ENG 1(2) THR LEVER DISAGREE (Cont'd)

Ident.: PRO-ABN-ENG-AA-00018697.0004001 / 21 MAR 16

L2 On ground: if the failure occurs while thrust lever is not in TOGA or FLX/MCT, FADEC selects idle.
During takeoff: if the failure occurs during takeoff (with thrust lever in TOGA or FLX/MCT), FADEC maintains T.O., FLEX TO, DRT TO ◁ thrust until thrust reduction, after which the maximum available thrust is CLB.
In flight: if the failure occurs in flight while thrust lever is between IDLE and MCT, FADEC selects the highest TLA limited to CLB. At landing gear extension, FADEC selects idle. In case of go-around, maximum available thrust is CLB when nose gear is retracted.

L1 **LAND ASAP**

- **On Ground:**

  ENG (AFFECTED) AT IDLE

  L2 *If thrust levers not in TOGA or FLX/MCT, FADEC selects idle power automatically.*

L1
- **In Flight:**

  MAX AVAIL PWR: CLB

  - **When L/G down:**

    ENG (AFFECTED) AT IDLE

    L2 *The FADEC automatically selects idle thrust*
    - *At landing gear extension, or*
    - *If affected EIU is failed when MN < 0.40 (for GE or RR), or MN < 0.33 (for PW).*

    In case of go-around, maximum available thrust is CLB when nose gear is retracted.

L1
  - **If A/THR is ON:**

    A/THR...KEEP ON

  - **If A/THR is not ON**

    A/THR...ON

    L2 *With A/THR active, thrust is automatically managed between idle and the highest TLA position as long as the landing gear is up.*

Continued on the following page

ENG 1(2) THR LEVER DISAGREE (Cont'd)

Ident.: PRO-ABN-ENG-AA-00018698.0004001 / 04 DEC 17

L12

STATUS

- **On ground:**
  ENG (AFFECTED) AT IDLE
- **In flight:**
  ENG (AFFECTED) MAX AVAIL PWR: CLB
  - **WHEN L/G DOWN:**
    ENG (AFFECTED) AT IDLE
  - **If EIVMU (affected) is failed:**
    - **WHEN MN < 0.4 (for GE or RR) or WHEN MN < 0.33 (for PW)**
      ENG (AFFECTED) AT IDLE

APPR PROC

FOR LDG... USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

INOP SYS

ENG 1(2) THR LVR

ENG 1(2) THR LEVER FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

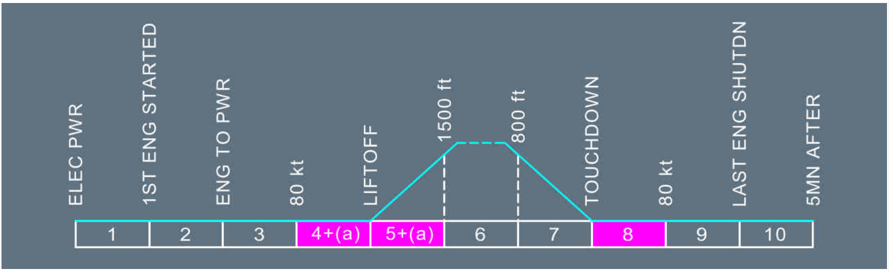
Ident.: PRO-ABN-ENG-AC-00018352.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both resolvers on one thrust lever are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
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Note: Alert not inhibited in the flight phases 4 and 5, if the engine thrust is automatically set to idle.

Continued on the following page

ENG 1(2) THR LEVER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-AC-00018713.0004001 / 04 DEC 17

LAND ASAP

- **On the ground:**
  ENG (AFFECTED) IDLE ONLY

L2 *FADEC selects idle power automatically.*
If associated thrust reverser is already deployed, FADEC commands restow.

L1
- **In flight:**

L2 If the selected thrust lever position at the time of fault detection is:
TOGA or FLEX: FADEC freezes takeoff or flex takeoff thrust until slat retraction. At slat retraction, the FADEC selects CLB thrust.
Between IDLE and MCT: In manual thrust setting mode, engine rating increases and freezes at CLB thrust. At slats or landing gear extension, FADEC selects idle power automatically.
It is possible to activate the A/THR. If selected, A/THR mode will manage thrust between idle and CLB as long as the landing gear is up and the slats are in.

L1
- **If the affected engine is already at idle or when slats or landing gear are extended:**
  ENG (AFFECTED) IDLE ONLY
- **During takeoff or when slats and landing gear are retracted:**
  ENG (AFFECTED) HI PWR IN MAN THR
  - **If A/THR on:**
    A/THR.. KEEP ON
  - **If A/THR not on:**
    A/THR.. ON
- **BEFORE SLATS IN:**
  A/THR.. ON
- **If EIVMU not avail and FLX/MCT/TOGA selected:**
  ENG (AFFECTED) HI PWR ONLY

L2 *Engine thrust is frozen at takeoff power.*

Continued on the following page

ENG 1(2) THR LEVER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-AC-00018714.0005001 / 12 JUL 18

L12

STATUS

- **For aircraft equipped with GA SOFT ⩤ :**
  GA THR: TOGA ONLY

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- **WHEN L/G DOWN OR SLATS OUT:**
  ENG (AFFECTED) IDLE ONLY
- **If EIVMU (affected) is failed:**
  - **WHEN MN < 0.4 (for GE or RR) or WHEN MN < 0.33 (for PW)**
    ENG (AFFECTED) IDLE ONLY

INOP SYS

ENG 1(2) THR LVR
REV 1(2)
GA SOFT ⩤

ENG 1(2) THR LEVER FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

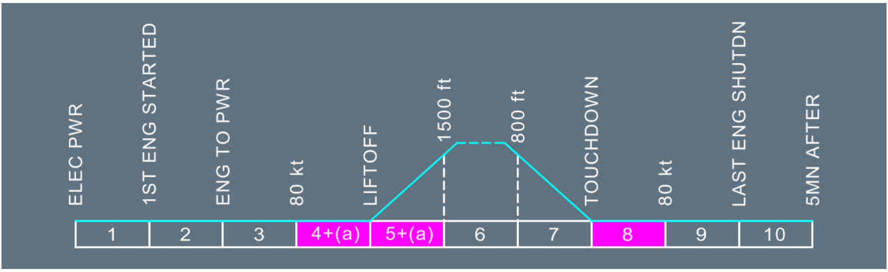
Ident.: PRO-ABN-ENG-AC-00018352.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both resolvers on one thrust lever are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
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4+(a)
5+(a)
6
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Note: Alert not inhibited in the flight phases 4 and 5, if the engine thrust is automatically set to idle.

Continued on the following page

ENG 1(2) THR LEVER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-AC-00018713.0002001 / 21 MAR 16

LAND ASAP

- **On the ground:**

  ENG (AFFECTED) AT IDLE

  L2 *FADEC selects idle power automatically.*
  If associated thrust reverser is already deployed, FADEC commands restow.

- L1 **In flight:**

  L2 If the selected thrust lever position at the time of fault detection is:
  TOGA or FLEX: FADEC freezes takeoff or flex takeoff thrust until slat retraction. At slat retraction, the FADEC selects CLB thrust.
  Between IDLE and MCT: In manual thrust setting mode, engine rating increases and freezes at CLB thrust. At slats or landing gear extension, FADEC selects idle power automatically.
  It is possible to activate the A/THR. If selected, A/THR mode will manage thrust between idle and CLB as long as the landing gear is up and the slats are in.

  L1
  - **During takeoff or when slats and landing gear are retracted:**

    ENG (AFFECTED) HI PWR IN MAN THR

    - **If A/THR on:**

      A/THR.. KEEP ON

    - **If A/THR not on:**

      A/THR.. ON

  - **BEFORE SLATS IN:**

    A/THR.. ON

  - **If EIU not avail and FLX/MCT/TOGA selected:**

    ENG (AFFECTED) HI PWR ONLY

    L2 *Engine thrust is frozen at takeoff power.*

Continued on the following page

ENG 1(2) THR LEVER FAULT (Cont'd)

Ident.: PRO-ABN-ENG-AC-00018714.0003001 / 21 MAR 16

L12

STATUS

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

- **WHEN L/G DOWN OR SLATS OUT:**
  ENG (AFFECTED) AT IDLE
- **If EIU (affected) is failed:**
  - **WHEN MN < 0.4 (for GE or RR) or WHEN MN < 0.33 (for PW)**
    ENG (AFFECTED) AT IDLE

INOP SYS

ENG 1(2) THR LVR
REV 1(2)

ENG 1(2) THRUST LIMITED

Applicable to: LV-KHT, LV-KHU

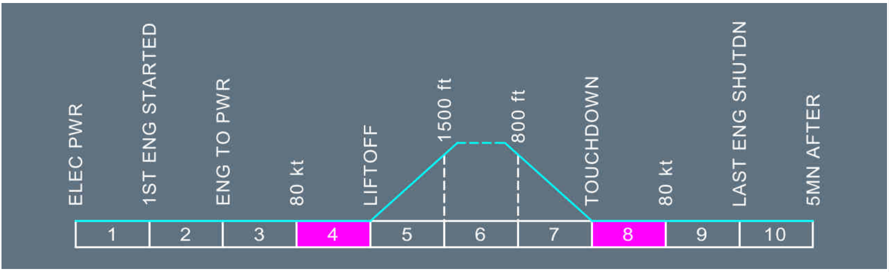
Ident.: PRO-ABN-ENG-CW-00018360.0003001 / 10 MAY 21

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FADEC limits the engine thrust to up to 30 % of the maximum takeoff thrust, to protect the integrity of the Intermediate Pressure Turbine.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-CW-00018760.0006001 / 21 MAR 16

- **After 10 min:**
  THR LEVER 1(2).. IDLE

ENG 1(2) TURBINE OVHT

Applicable to: LV-KHT, LV-KHU

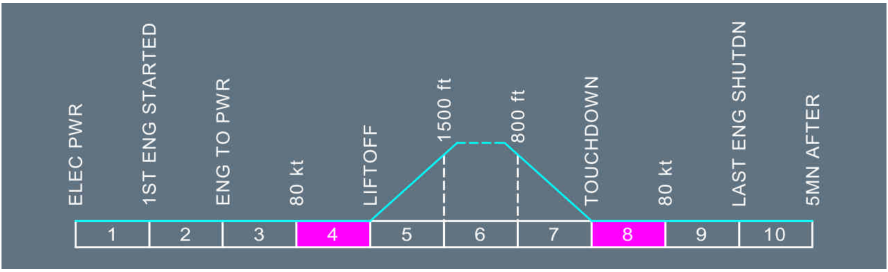
Ident.: PRO-ABN-ENG-CX-00018362.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a turbine overheat is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-CX-00011782.0001001 / 21 MAR 16

THR LEVER (AFFECTED ENGINE)............IDLE

- **IF WARNING PERSISTS:**

  ENG MASTER (AFFECTED ENGINE)............OFF

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG SHUT DOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN)

ENG 1(2) XWIND PROT FAULT

Applicable to: LV-KHT, LV-KHU

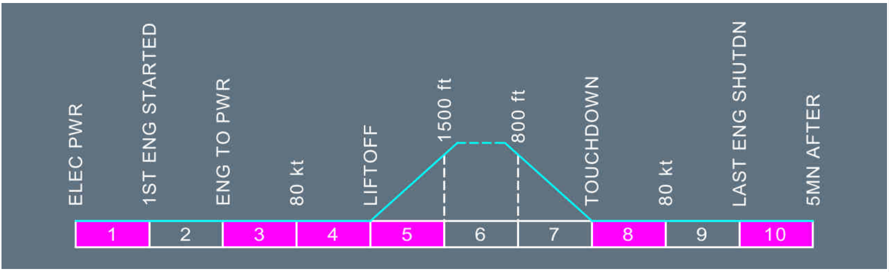
Ident.: PRO-ABN-ENG-CZ-00018364.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the thrust application logic for the automatic rolling takeoff is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-CZ-00018772.0001001 / 21 MAR 16

- **On the ground (if the auto rolling takeoff logic is inoperative):**
  T.O THRUST.. SET SLOWLY
- **In flight (if the auto rolling takeoff logic is active):**
  ENG (AFFECTED) SLOW RESPONSE

ENG EPR MODE RECOVERABLE

Applicable to: LV-KHT, LV-KHU

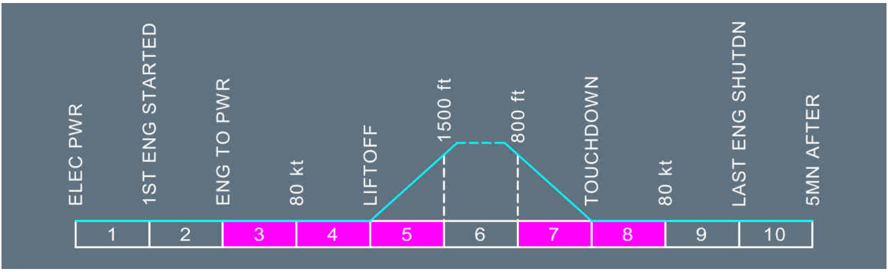
Ident.: PRO-ABN-ENG-DE-00018373.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when, after an ENG 1(2) EPR MODE FAULT, at least one of the engines is in N1 mode and all the engines can recover the EPR mode.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-DE-00018801.0003001 / 21 MAR 16

L2 With the current EEC Standard, there is no thrust lock at A/THR disengagement when reverting to EPR mode. To avoid a thrust increase, disconnect the A/THR before reverting to EPR mode.

L1 ALL ENG N1 MODE .... OFF

- **If A/THR is not available:**

  MAN THR .... ADJUST

ENG RISK OF STATOR ICING

Applicable to: LV-KHT, LV-KHU

Ident.: PRO-ABN-ENG-HA-00023955.0003001 / 26 NOV 19

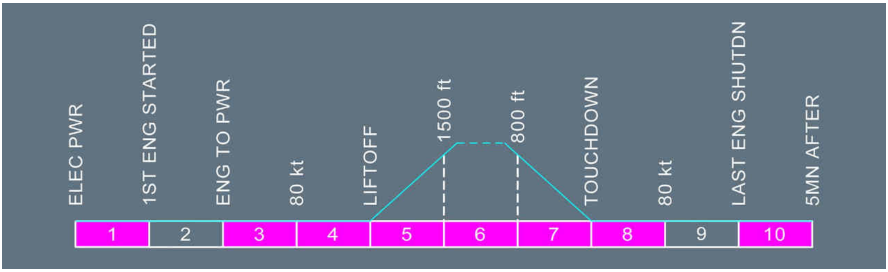
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers if all the following conditions are satisfied:
- OAT below 1 °C
- Engine anti-ice set to ON
- Cumulative engine idle time since the previous landing above 40 min
- No engine core de-icing procedure performed.

This alert is reset if:
- The aircraft is in flight, or
- The engine core de-icing procedure is performed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-HA-00023956.0003001 / 26 NOV 19

- **IF FREEZING FOG:**

  CORE DEICE PROC..APPLY

L2 *Refer to PRO-NOR-SUP-ADVWXR Engine Ice Shedding on Ground.*

ENG T.O THRUST DISAGREE

Applicable to: ALL

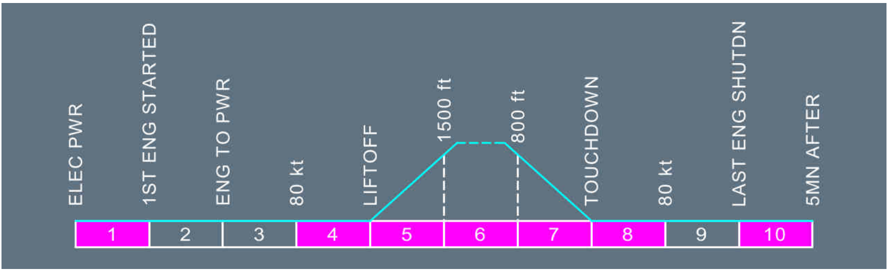
Ident.: PRO-ABN-ENG-DH-00018382.0001001 / 10 MAY 21

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a rating discrepancy between two engines is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-DH-00018815.0001001 / 21 MAR 16

Crew awareness.

ENG THR LEVERS NOT SET

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

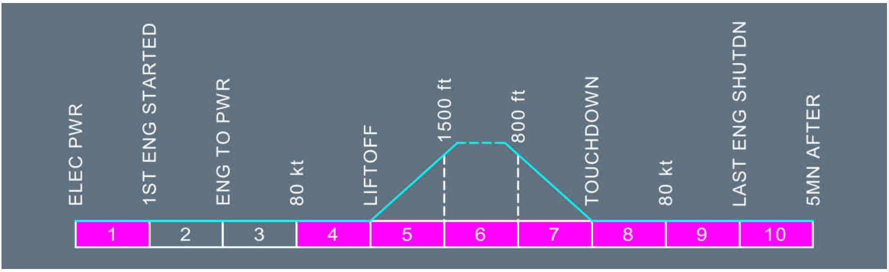
Ident.: PRO-ABN-ENG-DI-00018383.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when at least one FADEC engaged a takeoff thrust mode that is not in accordance with the position of the thrust levers.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG THR LEVERS NOT SET (Cont'd)

Ident.: PRO-ABN-ENG-DI-00018825.0013001 / 05 MAY 22

Note: 1. *The takeoff thrust mode is engaged when the flight crew sets the thrust levers above the CL position.*
2. *The flex thrust mode is armed only if the flight crew entered a FLEX TO TEMP on the MCDU that is above the OAT.*
3. *The derated thrust mode is armed only if the flight crew entered a DERATE level on the MCDU.*

■ **If the flex mode is not armed, and the flight crew sets the thrust levers at or below the MCT/FLX position:**

THR LEVERS.. TOGA

L2 *If the THR levers are in the MCT/FLX position and the flight crew does not set the THR levers to the TOGA position within 8 s, the FADEC automatically selects TOGA thrust.*

L1 ■ **If the flex mode is armed, and the flight crew sets the thrust levers below the MCT/FLX position:**

THR LEVERS.. MCT/FLX

■ **If the derated mode is not armed, and the flight crew sets the thrust levers at or below the MCT/FLX position:**

THR LEVERS.. TOGA

■ **If the derated mode is armed, and the flight crew sets the thrust levers at any position except the MCT/FLX position:**

THR LEVERS.. MCT/FLX

ENG THR LEVERS NOT SET

Applicable to: LV-KHT, LV-KHU

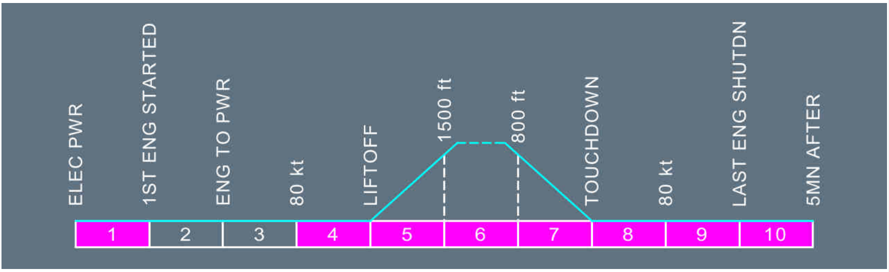
Ident.: PRO-ABN-ENG-DI-00018383.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when at least one FADEC engaged a takeoff thrust mode that is not in accordance with the position of the thrust levers.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

ENG THR LEVERS NOT SET (Cont'd)

Ident.: PRO-ABN-ENG-DI-00018825.0004001 / 27 OCT 16

Note: 1. *The takeoff thrust mode is engaged when the flight crew sets the thrust levers above the CL position.*
2. *The flex thrust mode is armed only if the flight crew entered a FLEX TO TEMP on the MCDU that is above the OAT.*
3. *The derated thrust mode is armed only if the flight crew entered a DERATE level on the MCDU.*

■ **If the flex mode is not armed, and the flight crew sets the thrust levers below or at the MCT/FLX position:**

THR LEVERS.. TOGA

■ **If the flex mode is armed, and the flight crew sets the thrust levers below the MCT/FLX position:**

THR LEVERS.. MCT/FLX

■ **If the derated mode is not armed, and the flight crew sets the thrust levers below or at the MCT/FLX position:**

THR LEVERS.. TOGA

■ **If the derated mode is armed, and the flight crew sets the thrust levers at any position except the MCT/FLX position:**

THR LEVERS.. MCT/FLX

ENG THRUST LOCKED

Applicable to: ALL

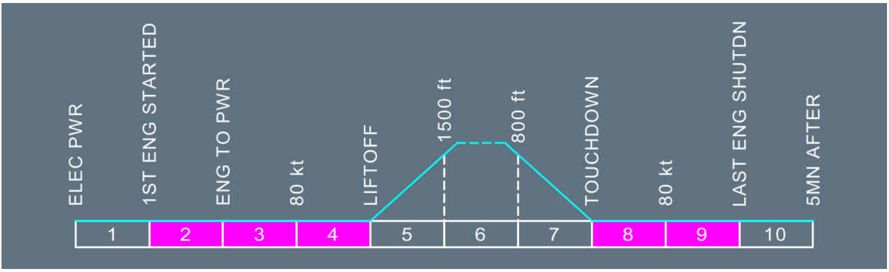
Ident.: PRO-ABN-ENG-DJ-00018385.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the thrust is frozen on one or more engines after a failure or an involuntary autothrust disconnection.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-DJ-00018817.0001001 / 21 MAR 16

L2 This alert is automatically repeated every 5 s until thrust levers are moved

L1 THR LEVERS...MOVE

ENG THRUST LOSS

Applicable to: ALL

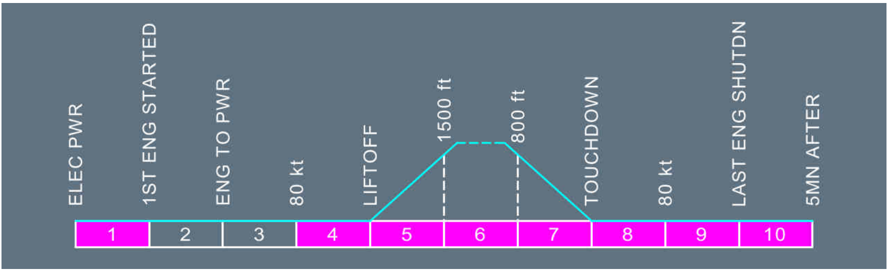
Ident.: PRO-ABN-ENG-DK-00018386.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the actual bleed configuration, as seen by the FADEC, is not in accordance with the bleed configuration requested by the crew.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-DK-00018818.0001001 / 21 MAR 16

- **If abnormal engine anti-ice:**

  ABNORM ENG A. ICE

  THR LEVERS....................IDLE

- **If abnormal wing anti-ice:**

  ABNORM WING A. ICE

  THR LEVERS....................IDLE

- **If abnormal bleed or pack:**

  ABNORM BLEED OR PACK

  THR LEVERS....................IDLE

ENG TYPE DISAGREE

Applicable to: ALL

Ident.: PRO-ABN-ENG-DL-00018387.0001001 / 21 MAR 16

ANNUNCIATIONS

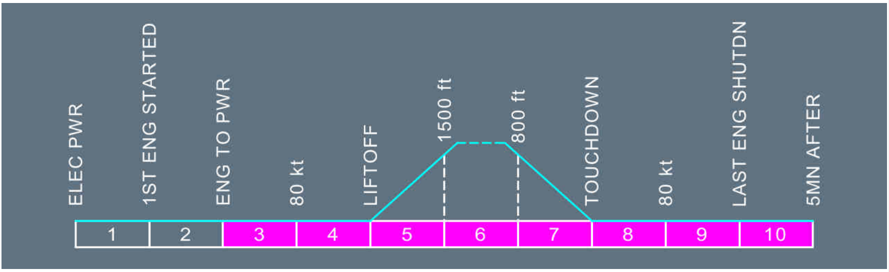
Triggering Conditions:

L2

This alert triggers when:

- The engine ratings seen by the FWC are not identical for all engines, or
- The engine ratings are different from the rating memorized by the FWC.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-ENG-DL-00018819.0001001 / 21 MAR 16

Crew awareness.

[QRH] LANDING WITH SLATS OR FLAPS JAMMED

Ident.: PRO-ABN-F_CTL-00024479.0008001 / 10 MAY 21
Applicable to: LV-KAN, LV-KAO

- **If SLATS jammed at 0 :**

  MAX RECOMMENDED WEIGHT FOR LANDING: 220 t (485 klb)
  FUEL JETTISON....................CONSIDER

LDG DIST PROC....................APPLY

L2 *Determine flap lever position for landing.*

L1 ■ **If SLATS jammed at 0, for approach:**

MANEUVER WITH CARE

Note: *The **OVERSPEED** alert and VLS displayed on the PFD, are computed according to the actual flaps/slats position. Disregard VFE, VFE NEXT displayed on PFD.*

SPD SEL.................... 235 kt
AT 235 kt: SELECT FLAPS LEVER 1
SPD SEL.................... 215 kt

Note:
- *The speed domain may transiently close when selecting CONF 2*
- *Above 220 t (485 klb), it is necessary to temporarily disconnect the A/THR to prevent rapid deceleration down to stall warning and select a speed slightly below VLS. A/THR can be re-engaged when the landing configuration is established*
- *In case of Alpha Prot activation accompanied by Alpha floor, disconnect A/THR and re-engage when speed is no longer in Alpha protection.*

AT 215 kt: SELECT FLAPS LEVER 2

DECELERATE TO 188 kt

L2 *188 kt is the maximum approach speed for aircraft with gross weight close to MTOW in CONF 2*

L1 ■ **If FLAPS jammed, OR if SLATS jammed > 0, for approach:**

Repeat the following until landing configuration is reached:
SPD SEL.................... VFE NEXT -5 kt
AT VFE NEXT: SELECT FLAPS LEVER ONE STEP DOWN

Note:
- *The **OVERSPEED** alert and VLS displayed on the PFD, are computed according to the actual flaps/slats position*
- *VFE and VFE NEXT are displayed on the PFD according to the FLAPS lever position. If not displayed, use the placard speeds*

Continued on the following page

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

- *If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

● **When in landing CONF and in final approach:**

DECELERATE TO CALCULATED VAPP

AP BELOW 500 ft AGL: DO NOT USE

● **For Go-around:**

USE MAX SPEED FROM TABLE BELOW UNLESS ECAM DISPLAYS A LOWER VALUE

MAX SPEED					
Flaps Slats	$F = 0$	$0 < F \leq 1$	$1 < F \leq 2$	$2 < F \leq 3$	$F > 3$
$S = 0$	NO LIMITATION	215 kt	196 kt	186 kt	180 kt
$0 < S \leq 1$	240 kt				
$S > 1$	215 kt	205 kt			

■ **If SLATS FAULT:**

● **For circuit:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

● **For diversion:**

SELECT FLAPS LEVER 0

■ **If SLATS jammed at 0:**

USE NORMAL OPERATING SPEEDS

■ **If SLATS jammed > 0:**

Recommended speed for diversion: MAX SPEED -10 kt

INCREASED FUEL CONSUMPTION

■ **If FLAPS FAULT:**

● **For circuit:**

MAINTAIN SLATS/FLAPS CONFIGURATION

Recommended speed: MAX SPEED -10 kt

Continued on the following page

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

- **For diversion:**
  - **If FLAPS jammed at 0:**

    SELECT FLAPS LEVER 0

    USE NORMAL OPERATING SPEEDS
  - **If FLAPS jammed > 0:**

    MAINTAIN SLATS/FLAPS CONFIGURATION

    Recommended speed for diversion: MAX SPEED -10 kt

    INCREASED FUEL CONSUMPTION

    Note: *In some cases, MAX SPEED -10 kt may be slightly above VFE as VFE is linked to the S/F lever position. However, the Overspeed warning will not trigger as it is based on the actual slats/flaps position.*

CAUTION	For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by the applicable Fuel Penalty Factor provided in the QRH, to obtain the fuel penalty required to reach the destination in the current configuration. *Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table*

[QRH] LANDING WITH SLATS OR FLAPS JAMMED

Ident.: PRO-ABN-F_CTL-00024479.0001001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

● **If SLATS jammed at 0 :**

MAX RECOMMENDED WEIGHT FOR LANDING: 220 t (485 klb)

LDG DIST PROC..APPLY

L2 *Determine flap lever position for landing.*

L1 ■ **If SLATS jammed at 0, for approach:**

MANEUVER WITH CARE

Note: *The* ***OVERSPEED*** *alert and VLS displayed on the PFD, are computed according to the actual flaps/slats position. Disregard VFE, VFE NEXT displayed on PFD.*

SPD SEL..235 kt
AT 235 kt: SELECT FLAPS LEVER 1
SPD SEL..215 kt

Note:
- *The speed domain may transiently close when selecting CONF 2*
- *Above 220 t (485 klb), it is necessary to temporarily disconnect the A/THR to prevent rapid deceleration down to stall warning and select a speed slightly below VLS. A/THR can be re-engaged when the landing configuration is established*
- *In case of Alpha Prot activation accompanied by Alpha floor, disconnect A/THR and re-engage when speed is no longer in Alpha protection.*

AT 215 kt: SELECT FLAPS LEVER 2

DECELERATE TO 188 kt

L2 *188 kt is the maximum approach speed for aircraft with gross weight close to MTOW in CONF 2*

L1 ■ **If FLAPS jammed, OR if SLATS jammed > 0, for approach:**

Repeat the following until landing configuration is reached:
SPD SEL..VFE NEXT -5 kt
AT VFE NEXT: SELECT FLAPS LEVER ONE STEP DOWN

Note:
- *The* ***OVERSPEED*** *alert and VLS displayed on the PFD, are computed according to the actual flaps/slats position*
- *VFE and VFE NEXT are displayed on the PFD according to the FLAPS lever position. If not displayed, use the placard speeds*

Continued on the following page

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

- *If VLS is greater than VFE NEXT (overweight landing case), the FLAPS lever can be set in the required next position while the speed is reduced to follow VLS reduction as surfaces extend. The VFE warning threshold should not be triggered. In this case, disconnect the A/THR. A/THR can be re-engaged when the landing configuration is established.*

- **When in landing CONF and in final approach:**

  DECELERATE TO CALCULATED VAPP

  AP BELOW 500 ft AGL: DO NOT USE

- **For Go-around:**

  USE MAX SPEED FROM TABLE BELOW UNLESS ECAM DISPLAYS A LOWER VALUE

MAX SPEED					
Flaps **Slats**	**F = 0**	**0 < F ≤ 1**	**1 < F ≤ 2**	**2 < F ≤ 3**	**F > 3**
S = 0	NO LIMITATION	215 kt	196 kt	186 kt	180 kt
0 < S ≤ 1	240 kt				
S > 1	215 kt	205 kt			

- ■ **If SLATS FAULT:**
  - **For circuit:**

    MAINTAIN SLATS/FLAPS CONFIGURATION

    Recommended speed: MAX SPEED -10 kt

  - **For diversion:**

    SELECT FLAPS LEVER 0

    - ■ **If SLATS jammed at 0:**

      USE NORMAL OPERATING SPEEDS

    - ■ **If SLATS jammed > 0:**

      Recommended speed for diversion: MAX SPEED -10 kt

      INCREASED FUEL CONSUMPTION

- ■ **If FLAPS FAULT:**
  - **For circuit:**

    MAINTAIN SLATS/FLAPS CONFIGURATION

    Recommended speed: MAX SPEED -10 kt

Continued on the following page

[QRH] LANDING WITH SLATS OR FLAPS JAMMED (Cont'd)

- **For diversion:**
  - **If FLAPS jammed at 0:**

    SELECT FLAPS LEVER 0

    USE NORMAL OPERATING SPEEDS
  - **If FLAPS jammed > 0:**

    MAINTAIN SLATS/FLAPS CONFIGURATION

    Recommended speed for diversion: MAX SPEED -10 kt

    INCREASED FUEL CONSUMPTION

    Note: *In some cases, MAX SPEED -10 kt may be slightly above VFE as VFE is linked to the S/F lever position. However, the Overspeed warning will not trigger as it is based on the actual slats/flaps position.*

CAUTION	For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to the fuel flow indication. As a guideline, determine the fuel consumption in clean configuration at the same altitude without airspeed limitation (e.g. From ALTERNATE FLIGHT PLANNING tables) and multiply this result by the applicable Fuel Penalty Factor provided in the QRH, to obtain the fuel penalty required to reach the destination in the current configuration. *Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table*

[QRH] NO FLAPS NO SLATS LANDING

Ident.: PRO-ABN-F_CTL-00010067.0004001 / 30 JUN 20
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

LDG DIST PROC...APPLY
SPD SEL...GREEN DOT
GPWS FLAP MODE...OFF
FLAPS LEVER...CONF 1

Set the FLAPS lever to CONF 1, in order to enable engagement of the SRS guidance mode, in the case of a go-around. The SRS guidance mode may not engage if the landing gear is up.
Disregard VFE.
The VFE displayed on the PFD depends on the flap lever position. So, a false VFE will be given.
Plan a long stabilized approach.

- **For final approach:**

  A/THR...OFF
  SPD SEL...VAPP

  Select VLS on the PFD (or VREF + 50 kt, if VLS is not available).

  AP BELOW 500 ft AGL: DO NOT USE

  AT 500 ft: REDUCE SPEED TO OBTAIN VLS - 5 kt (OR VREF + 45 kt) AT TOUCHDOWN

[QRH] NO FLAPS NO SLATS LANDING

Ident.: PRO-ABN-F_CTL-00010067.0001001 / 26 NOV 19
Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

LDG DIST PROC.......................................APPLY
SPD SEL.......................................GREEN DOT
GPWS FLAP MODE.......................................OFF
FLAPS LEVER.......................................CONF 1

Disregard the CONF 2 requirement on the ECAM status page.

Set the FLAPS lever to CONF 1, in order to enable engagement of the SRS guidance mode, in the case of a go-around. The SRS guidance mode may not engage if the landing gear is up.

Disregard VFE.

The VFE displayed on the PFD depends on the flap lever position. So, a false VFE will be given.

Plan a long stabilized approach.

- **For final approach:**

  A/THR.......................................OFF
  SPD SEL.......................................VAPP

  Select VLS on the PFD (or VREF + 50 kt, if VLS is not available).

  AP BELOW 500 ft AGL: DO NOT USE

  AT 500 ft: REDUCE SPEED TO OBTAIN VLS - 5 kt (OR VREF + 45 kt) AT TOUCHDOWN

[QRH] RUDDER JAM / RUDDER PEDAL JAM

Ident.: PRO-ABN-F_CTL-00019204.0007001 / 26 NOV 19
Applicable to: ALL

Use the F/CTL SD page for a visual check of the rudder position.
This procedure also applies to RUDDER PEDAL JAM cases.

LDG DIST PROC.......................................APPLY

- **For approach:**

  AVOID LANDING WITH XWIND FROM THE SIDE WHERE THE RUDDER IS DEFLECTED

  MAX CROSSWIND FOR LDG: 15 kt

  FOR LANDING: USE FLAP 2
  GPWS FLAP MODE.......................................OFF

  - **If all engines operative:**
    SPD SEL.......................................VAPP
    SPEED AND TRAJECTORY.......................................STABILIZE ASAP

  - **In case of Engine-Out:**

    APPR SPEED: SPD SEL 170 kt
    SPEED AND TRAJECTORY.......................................STABILIZE ASAP
    AP.......................................OFF
    A/THR.......................................OFF

    FOR GO AROUND: SPD SEL 170 kt

- **For landing:**
  DIFFERENTIAL BRAKING.......................................USE ASAP

  REVERSER: SYMMETRIC USE ONLY

  Use the nosewheel steering handle below 100 kt only in case of RUDDER PEDAL JAM.

[QRH] RUDDER TRIM RUNAWAY

Ident.: PRO-ABN-F_CTL-00019206.0004001 / 17 MAR 17
Applicable to: ALL

USE LATERAL CONTROL TO LEVEL WINGS
USE RUDDER WITH CARE
USE RUDDER PEDALS TO CENTER RUDDER

Check the rudder position on the F/CTL SD page.

Note: *This failure is seen mainly as uncommanded roll (induced by yaw). In most conditions, the aircraft stabilizes in a steady heading sideslip.*
For continued flight, either maintain rudder central or leave the aircraft in a steady stabilized heading sideslip, but ensure that all changes between rudder centralized and steady heading sideslip are made smoothly. As speed is reduced, the FCPC may allow more rudder to be applied by the trim runaway.

USE NORMAL CONF FOR LANDING

F/CTL AIL SERVO FAULT

Applicable to: ALL

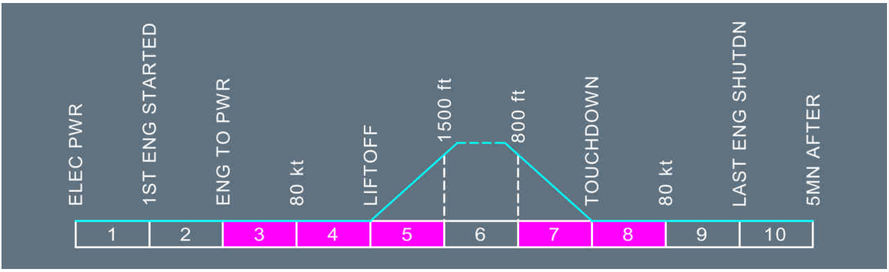
Ident.: PRO-ABN-F_CTL-AN-00017611.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of one servojack on one aileron.

Flight Phase Inhibition:



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F/CTL AIL SERVO FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AN-00010396.0001001 / 25 FEB 14

Crew awareness.

F/CTL ALTN LAW

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

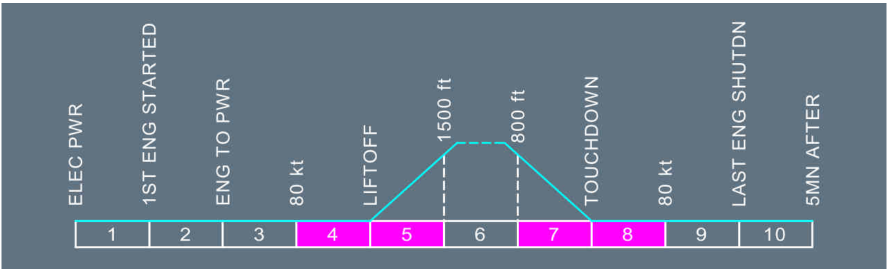
Ident.: PRO-ABN-F_CTL-H-00017612.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the alternate law is active.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL ALTN LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-H-00019033.0004001 / 26 NOV 19

- **In case of ELEC EMER CONFIG:**

  SPD BRK.. DO NOT USE

Maximum Flight Level:

Weight	160 t	180 t	200 t	220 t	230 t	240 t
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MAX SPEED...330/.82

L2 *Speed is limited due to degraded high speed protection.*

L1
- **If TLU function is lost:**

  RUD WITH CARE ABV 160KT

L2 *Note:* *In case of EGPWS ✻ alerts, since protections are lost, respect stall warnings when applying the EGPWS ✻ procedure.*

Ident.: PRO-ABN-F_CTL-H-00019034.0009001 / 15 NOV 22

L12

STATUS

MAX SPEED.. 330/.82
MAX FL.............................. REFER TO THE TABLE BELOW

Weight	*160 t / 353 klb*	*180 t / 397 klb*	*200 t / 441 klb*	*220 t / 485 klb*	*230 t / 507 klb*	*240 t / 529 klb*
Max FL	*FL 415*	*FL 380*	*FL 350*	*FL 330*	*FL 320*	*FL 310*

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

ALTN LAW: PROT LOST

INOP SYS

F/CTL PROT
CAT 2

F/CTL ALTN LAW

Applicable to: LV-FVI, LV-KAN, LV-KAO

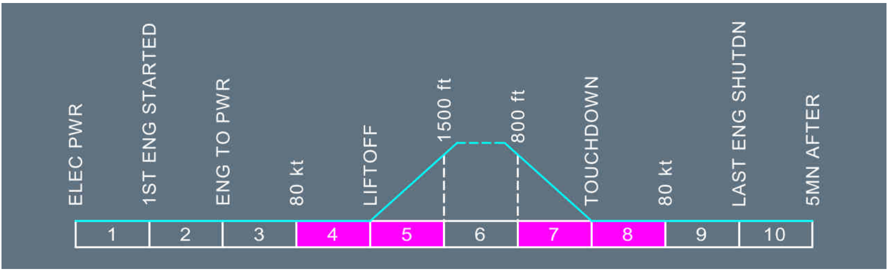
Ident.: PRO-ABN-F_CTL-H-00017612.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the alternate law is active.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-H-00019033.0011001 / 29 OCT 19

- **In case of ELEC EMER CONFIG:**

  SPD BRK.. DO NOT USE

MAX SPEED..330/.82

L2 *Speed is limited due to degraded high speed protection.*

L1
- **If TLU function is lost:**

  RUD WITH CARE ABV 160KT

L2 *Note:* *In case of EGPWS ◁ alerts, since protections are lost, respect stall warnings when applying the EGPWS ◁ procedure.*

Continued on the following page

F/CTL ALTN LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-H-00019034.0003001 / 22 MAR 17

L12

STATUS

MAX SPEED... 330/.82

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC... APPLY

ALTN LAW: PROT LOST

INOP SYS

F/CTL PROT
CAT 2

F/CTL ALTN LAW

Applicable to: LV-KHT

Ident.: PRO-ABN-F_CTL-H-00017612.0001001 / 21 MAR 16

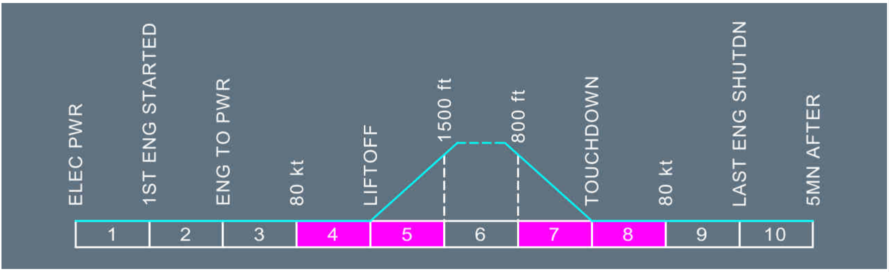
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the alternate law is active.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL ALTN LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-H-00019033.0004001 / 26 NOV 19

- **In case of ELEC EMER CONFIG:**

  SPD BRK.. DO NOT USE

Maximum Flight Level:

Weight	160 t	180 t	200 t	220 t	230 t	240 t
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MAX SPEED..330/.82

L2 *Speed is limited due to degraded high speed protection.*

L1
- **If TLU function is lost:**

  RUD WITH CARE ABV 160KT

L2 *Note:* *In case of EGPWS ◁ alerts, since protections are lost, respect stall warnings when applying the EGPWS ◁ procedure.*

Ident.: PRO-ABN-F_CTL-H-00019034.0015001 / 15 NOV 22

L12

STATUS

MAX SPEED.................................. 330/.82
MAX FL.................. REFER TO THE TABLE BELOW

Weight	*160 t / 353 klb*	*180 t / 397 klb*	*200 t / 441 klb*	*220 t / 485 klb*	*230 t / 507 klb*	*240 t / 529 klb*
Max FL	*FL 415*	*FL 380*	*FL 350*	*FL 330*	*FL 320*	*FL 310*

APPR PROC

FOR LDG.................................. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

ALTN LAW: PROT LOST

INOP SYS

F/CTL PROT

F/CTL ALTN LAW

Applicable to: LV-KHU

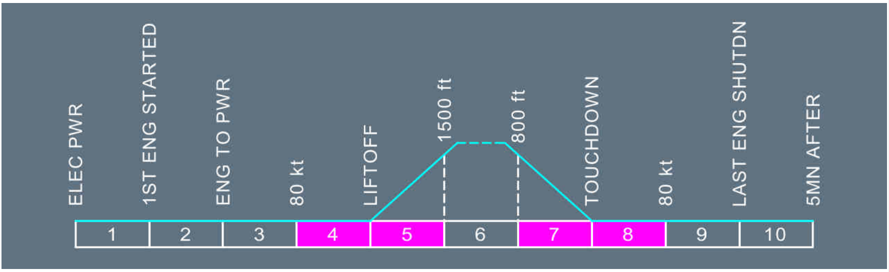
Ident.: PRO-ABN-F_CTL-H-00017612.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the alternate law is active.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-H-00019033.0011001 / 29 OCT 19

- **In case of ELEC EMER CONFIG:**

  SPD BRK.. DO NOT USE

MAX SPEED..330/.82

L2 *Speed is limited due to degraded high speed protection.*

L1
- **If TLU function is lost:**

  RUD WITH CARE ABV 160KT

L2 *Note: In case of EGPWS ⊲ alerts, since protections are lost, respect stall warnings when applying the EGPWS ⊲ procedure.*

Continued on the following page

F/CTL ALTN LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-H-00019034.0002001 / 22 MAR 17

L12

STATUS

MAX SPEED... 330/.82

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

ALTN LAW: PROT LOST

INOP SYS

F/CTL PROT

F/CTL DIRECT LAW

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

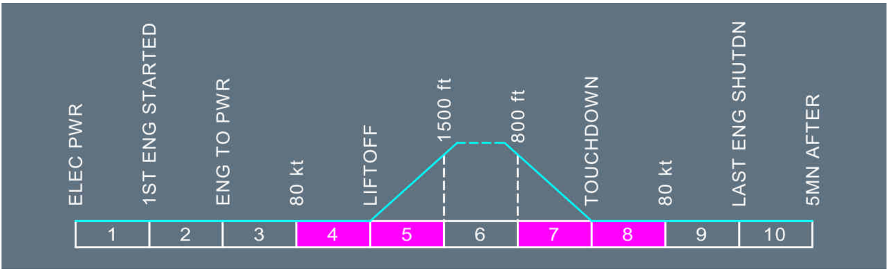
Ident.: PRO-ABN-F_CTL-I-00017613.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the direct law is active.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL DIRECT LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-I-00019035.0006001 / 26 NOV 19

L2 PFD displays «USE MAN PITCH TRIM» in amber.

L1 SPD BRK..DO NOT USE

Maximum Flight Level:

Weight	160 t	180 t	200 t	220 t	230 t	240 t
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MAX SPEED..330/.80

L2 *Note:* *In case of GPWS (EGPWS) alerts, since protections are lost, respect stall warning when applying the GPWS (EGPWS) procedure.*

Speed is limited due to the loss of high speed protection.
Do not exceed M 0.80 so as not to degrade handling qualities.

L1 MAN PITCH TRIM (EXCEPT IF B + Y HYD LO PR)..............................USE

L2 *Automatic trim is inoperative in direct law.*

L1 MANEUVER WITH CARE

L2 *Use small control inputs at high speed, since in direct law the controls are powerful. Use of manual thrust is recommended. Avoid large thrust changes.*

L1 ■ **If TLU function is lost:**

RUD WITH CARE ABV 160KT

■ **If the trim tank pump is operative:**

● **IF CG AFT 32%:**

T TANK MODE..FWD

L2 *Note:* *Fuel consumption is increased by approximately 1 %.*

L1 ■ **If the trim tank pump is inoperative:**

● **IF CG AFT 32% AND WHEN SPEED ABOVE 270KT AND NOT IN CLIMB:**

T TANK MODE..FWD

L2 *Note:* *Fuel consumption is increased by approximately 1 %.*

Continued on the following page

F/CTL DIRECT LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-I-00019037.0003001 / 21 MAR 16

L12

STATUS

SPD BRK.....................DO NOT USE
MAX SPEED..................... 330/.80
MANEUVER WITH CARE

APPR PROC

FOR LDG..................... USE FLAP 3

This line is replaced by “FOR LDG : USE FLAP 3” when CONF 3 is selected, as a reminder.

LDG DIST PROC..................... APPLY
MAN PITCH TRIM.....................USE

(except if B + Y HYD LO PR)

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE.....................FWD

    Note: If trim tank transfer is unavailable, consider descending to a lower altitude, where controllability is improved.
- **If the trim tank pump is inoperative:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**

    T TANK MODE.....................FWD

    Note: If trim tank transfer is unavailable, consider descending to a lower altitude, where controllability is improved.

DIRECT LAW: PROT LOST

INOP SYS

F/CTL PROT
AP 1 + 2
CAT 2

F/CTL DIRECT LAW

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

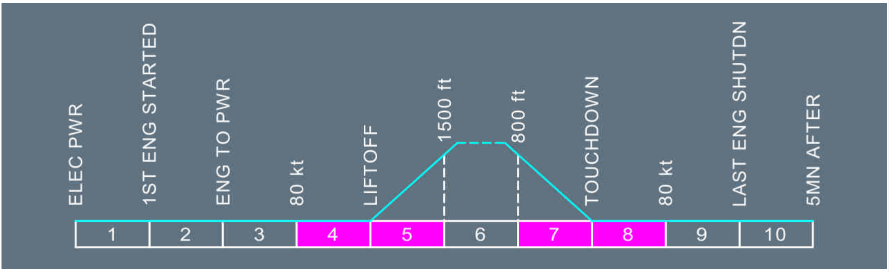
Ident.: PRO-ABN-F_CTL-I-00017613.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the direct law is active.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL DIRECT LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-I-00019035.0008001 / 29 OCT 19

L2 PFD displays «USE MAN PITCH TRIM» in amber.

L1 SPD BRK....................DO NOT USE
MAX SPEED....................330/.80

L2 Note: *In case of GPWS (EGPWS) alerts, since protections are lost, respect stall warning when applying the GPWS (EGPWS) procedure.*

Speed is limited due to the loss of high speed protection.
Do not exceed M 0.80 so as not to degrade handling qualities.

L1 MAN PITCH TRIM (EXCEPT IF B + Y HYD LO PR)....................USE

L2 *Automatic trim is inoperative in direct law.*

L1 MANEUVER WITH CARE

L2 *Use small control inputs at high speed, since in direct law the controls are powerful. Use of manual thrust is recommended. Avoid large thrust changes.*

L1
- **If TLU function is lost:**
  RUD WITH CARE ABV 160KT
- **If the trim tank pump is operative:**
  - **IF CG AFT 32%:**
    T TANK MODE....................FWD

    L2 Note: *Fuel consumption is increased by approximately 1 %.*

L1
- **If the trim tank pump is inoperative:**
  - **IF CG AFT 32% AND WHEN SPEED > 270KT AND NOT IN CLIMB:**
    T TANK MODE....................FWD

    L2 Note: *Fuel consumption is increased by approximately 1 %.*

Continued on the following page

F/CTL DIRECT LAW (Cont'd)

Ident.: PRO-ABN-F_CTL-I-00019037.0003001 / 21 MAR 16

L12

STATUS

SPD BRK..DO NOT USE
MAX SPEED..330/.80
MANEUVER WITH CARE

APPR PROC

FOR LDG..USE FLAP 3

This line is replaced by “FOR LDG : USE FLAP 3” when CONF 3 is selected, as a reminder.

LDG DIST PROC..APPLY
MAN PITCH TRIM..USE

(except if B + Y HYD LO PR)

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE..FWD

    Note: If trim tank transfer is unavailable, consider descending to a lower altitude, where controllability is improved.
- **If the trim tank pump is inoperative:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**

    T TANK MODE..FWD

    Note: If trim tank transfer is unavailable, consider descending to a lower altitude, where controllability is improved.

DIRECT LAW: PROT LOST

INOP SYS

F/CTL PROT
AP 1 + 2
CAT 2

F/CTL ELEV REDUND LOST
(AILERONS ARE NOT PRESET)

Applicable to: ALL

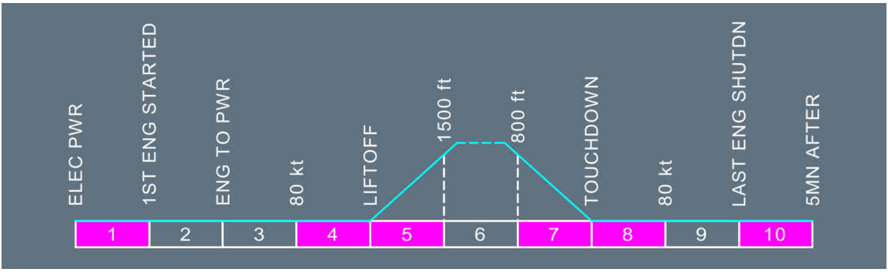
Ident.: PRO-ABN-F_CTL-K-00017614.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers, in case of dual failure, when a subsequent third failure affecting the F/CTL system may lead to degraded pitch control or pitch mechanical backup. Some failure combinations lead to an aileron preset to limit the pitch up effect in case of this third failure. If this third failure occurs, the ELEV REDUND LOST PROC and associated FL and speed limitations no longer apply. In this case, if the MAN PITCH TRIM ONLY message is displayed, it is recommended that the autothrust be disconnected to improve longitudinal control of the aircraft.

Flight Phase Inhibition:



Ident.: PRO-ABN-F_CTL-K-00019395.0003001 / 21 MAR 17

The autopilot is available.

SPD BRK...DO NOT USE
MAX FL...300/MORA
MAX SPEED...M0.75

- **WHEN SPD > 270 KT AND NOT IN CLIMB:**

  T TANK MODE...FWD

  L2 *Fuel consumption is increased by approximately 1 %.*
  Displayed, if the trim tank pump is failed.

Continued on the following page

F/CTL ELEV REDUND LOST (Cont'd)
(AILERONS ARE NOT PRESET)

Ident.: PRO-ABN-F_CTL-K-00019045.0003001 / 21 MAR 17

L12

STATUS

SPD BRK..DO NOT USE
MAX FL.. 300/MORA
MAX SPEED.. M0.75

- **WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE...FWD
  Displayed, if the trim tank pump is failed.

INOP SYS

CAT 3 DUAL

Note: *The STATUS and the INOP SYS list is completed according to the failures, which led to the elevator redundancy loss (green system, PRIM 2 or SEC 2).*

F/CTL ELEV REDUND LOST
(AILERONS ARE PRESET UPWARDS)

Applicable to: ALL

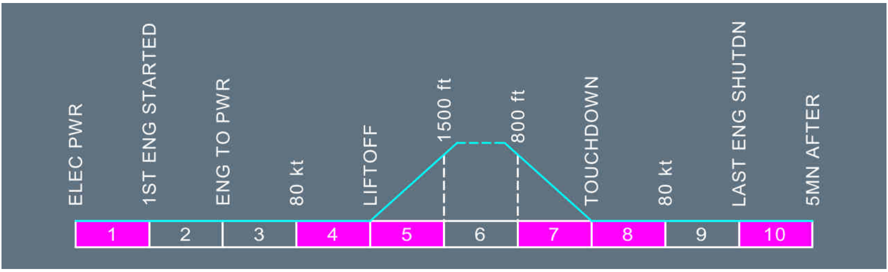
Ident.: PRO-ABN-F_CTL-J-00019398.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers, in case of dual failure, when a subsequent third failure affecting the F/CTL system may lead to degraded pitch control or pitch mechanical backup. Some failure combinations lead to an aileron preset to limit the pitch up effect in case of this third failure. If this third failure occurs, the ELEV REDUND LOST PROC and associated FL and speed limitations no longer apply. In this case, if the MAN PITCH TRIM ONLY message is displayed, it is recommended that the autothrust be disconnected to improve longitudinal control of the aircraft.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL ELEV REDUND LOST (Cont'd)
(AILERONS ARE PRESET UPWARDS)

Ident.: PRO-ABN-F_CTL-J-00019046.0003001 / 22 MAR 17

The autopilot is not available.

SPD BRK.......................................DO NOT USE
MAX FL.......................................350
MAX SPEED.......................................M0.80
FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE.......................................FWD

L2 *Displayed if the trim tank pump is failed.*
In case of an engine-out, the aileron preset is cancelled, and the autopilot may be recovered. Apply normal engine-out procedures. Below 2 000 ft RA, or when in CONF ≥ 2, the aileron preset is cancelled. The autopilot is available (provided, it is not lost due to another failure, such as an elevator failure).

Continued on the following page

F/CTL ELEV REDUND LOST (Cont'd)
(AILERONS ARE PRESET UPWARDS)

Ident.: PRO-ABN-F_CTL-J-00019047.0005001 / 22 MAR 17

L12

STATUS

SPD BRK..DO NOT USE
MAX FL..350
MAX SPEED..M0.80

- **WHEN SPD>270KT AND NOT IN CLIMB:**
  T TANK MODE..FWD
  Displayed, if the trim tank pump is failed.

FUEL CONSUMPT INCRSD

See (1)

AP MAY BE AVAIL IN CONF 2

UNDUE AFT CG WARNG RISK

FMS PRED UNRELIABLE

See (2)

CAT 3 SINGLE ONLY

- **IF NEW F/CTL FAILURE:**
  EXPECT MAN P. TRIM ONLY

INOP SYS

CAT 3 DUAL

Note: The STATUS and the INOP SYS list is completed according to the failures, which led to the loss of elevator redundancy (green system, PRIM 2 or SEC 2).

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL ELEV SERVO FAULT

Applicable to: ALL

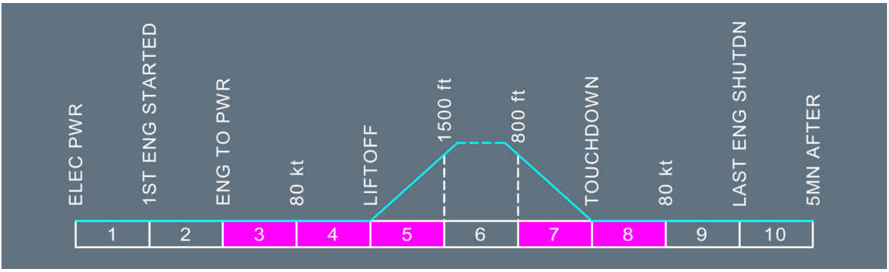
Ident.: PRO-ABN-F_CTL-R-00017615.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is loss of one servojack on one elevator.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-R-00019048.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-F_CTL-R-00010389.0001001 / 21 NOV 11

STATUS

	INOP SYS
CAT 3 SINGLE ONLY	CAT 3 DUAL

F/CTL FCDC 1(2) FAULT

Applicable to: ALL

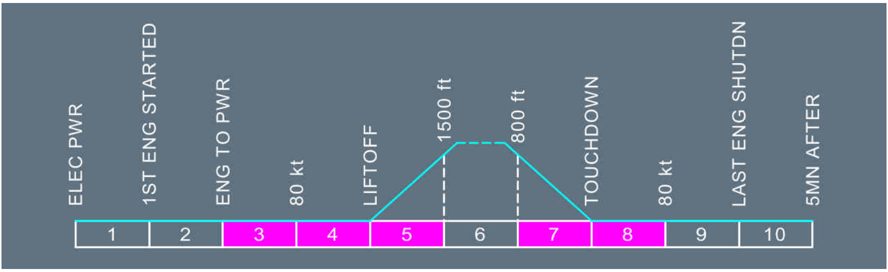
Ident.: PRO-ABN-F_CTL-T-00017616.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of one FCDC.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-T-00010392.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-T-00010393.0001001 / 05 AUG 10

STATUS

INOP SYS

FCDC 1(2)

F/CTL FCDC 1+2 FAULT

Applicable to: ALL

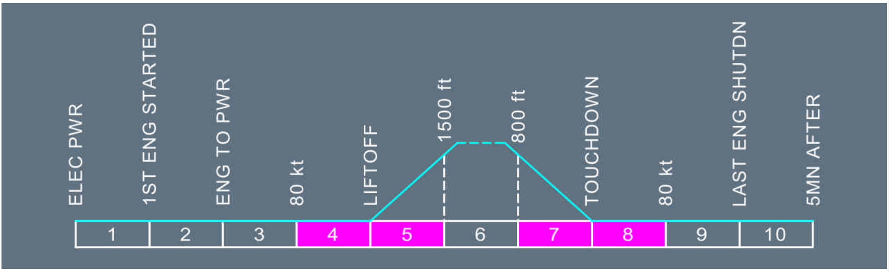
Ident.: PRO-ABN-F_CTL-U-00017617.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of both FCDCs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-U-00019049.0002001 / 21 MAR 16

- **ABOVE FL 200:**

  SPD BRK.. DO NOT USE

  L2 *Audio stall warning is available. It is not corrected for speed brakes extension and may come early with speed brakes out.*

L1 MONITOR F/CTL OVHD PNL

L2 *Note:*
- *Control law remains normal*
- *All information is flagged on the F/CTL SD page*
- *F/CTL warnings are not available on ECAM*
- *Stall warning is available*
- *Bank and pitch limits become amber on the PFD*
- *Vαmax, VαPROT and Vsw indications are lost on the PFD.*

Continued on the following page

F/CTL FCDC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-U-00019051.0002001 / 21 MAR 16

STATUS

- **ABOVE FL 200:**
  SPD BRK..DO NOT USE

F/CTL INDICATIONS LOST

INOP SYS

FCDC 1 + 2

F/CTL FLAPS FAULT/LOCKED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

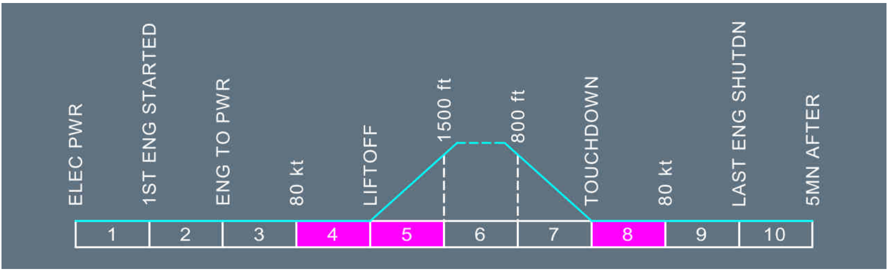
Ident.: PRO-ABN-F_CTL-E-00017540.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The FLAPS FAULT alert triggers when both flaps channels fail.
The FLAPS LOCKED alert triggers when the flaps wing tip brakes activate.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-E-00019055.0003001 / 03 NOV 22

L2 For landing with flaps jammed, see OPERATING TECHNIQUES (*Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed*).

L1 L2 The autopilot may be used down to 500 ft AGL. As it is not tuned for the abnormal configuration, its behavior can be less than optimum and must be monitored.

L1 MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited to the VFE corresponding to the next flaps position.*

L1 ● **WHEN SPEED BELOW VFE:**

FLAPS LEVER (IF FLAPS NOT LOCKED)..RECYCLE

L2 *Return to the previous selection, then back to the desired position.*

L1 *Note:* *In the case of F/CTL FLAPS FAULT, when idle is selected, approach idle is set on all engines. If there is a F/CTL FLAPS FAULT after a dual SFCC failure, ALTN law becomes active (Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST)). Speed limits are lost on PFD.*

● **If flaps extended:**

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED..330/0.82

Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-E-00019056.0016001 / 03 MAY 23

L12

STATUS

MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

APPR PROC

● **If FLAPS < 3 or 3 < FLAPS < FULL:**

GPWS FLAP MODE...OFF

■ **If slats and flaps are jammed in CONF 0:**

NO S/F LDG PROC...APPLY

Refer to PRO-ABN-F_CTL [QRH] No Flaps no Slats Landing.

FOR LDG..USE FLAP 1

This line is displayed if both SFCCs are lost and F/CTL FLAPS FAULT is displayed. This is replaced by "FOR LDG: USE FLAP 1" when CONF 1 is selected, as a reminder. Selecting FLAP 1 will not result in flaps/slats extension but will enable the engagement of the SRS guidance mode in the case of go-around.

■ **If slats and flaps are not jammed in CONF 0:**

S/F JAMMED PROC..APPLY

Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.

Note: *The ECAM procedure (below) just provides the final flap lever selection for landing, depending on the failed flaps position.*

■ **If FLAPS < 3:**

FOR LDG..USE FLAP 2

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder. The selection of

INOP SYS

FLAPS
CAT 2

Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

FLAP 2 instead of FLAP 3 permits the increase of VMAX on the PFD.

- **If FLAPS = 3:**

  FOR LDG..USE FLAP 3

  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- **If FLAPS > 3:**

  FOR LDG..USE FLAP FULL

  This line is replaced by "FOR LDG: USE FLAP FULL" when CONF FULL is selected, as a reminder.

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

---

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL FLAPS FAULT/LOCKED

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

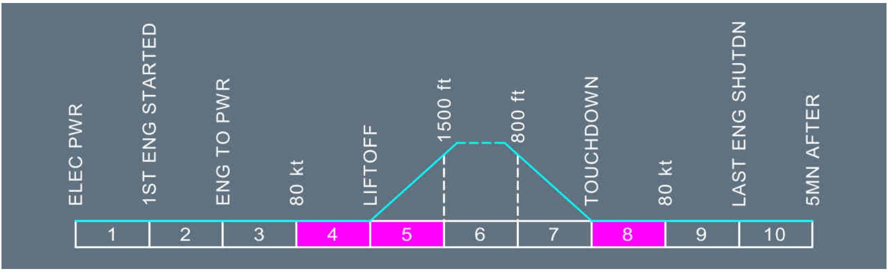
Ident.: PRO-ABN-F_CTL-E-00017540.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The FLAPS FAULT alert triggers when both flaps channels fail.
The FLAPS LOCKED alert triggers when the flaps wing tip brakes activate.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-E-00019055.0003001 / 03 NOV 22

L2 For landing with flaps jammed, see OPERATING TECHNIQUES (*Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed*).

L1 L2 The autopilot may be used down to 500 ft AGL. As it is not tuned for the abnormal configuration, its behavior can be less than optimum and must be monitored.

L1 MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited to the VFE corresponding to the next flaps position.*

L1
- **WHEN SPEED BELOW VFE:**

  FLAPS LEVER (IF FLAPS NOT LOCKED)..RECYCLE

L2 *Return to the previous selection, then back to the desired position.*

L1 *Note:* *In the case of F/CTL FLAPS FAULT, when idle is selected, approach idle is set on all engines. If there is a F/CTL FLAPS FAULT after a dual SFCC failure, ALTN law becomes active (Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST)). Speed limits are lost on PFD.*

- **If flaps extended:**

  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED...330/0.82

Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-E-00019056.0008001 / 03 MAY 23

L12

STATUS

MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

APPR PROC

- **If FLAPS < 3 or 3 < FLAPS < FULL:**
  GPWS FLAP MODE..OFF

S/F JAMMED PROC... APPLY

Refer to QRH/ABN-18 Landing with Slats or Flaps Jammed or Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed for managing the approach, and be prepared for a go-around.

Note: *The ECAM procedure (below) just provides the final flap lever selection for landing, depending on the failed flaps position.*

- **If FLAPS < 3:**
  FOR LDG..USE FLAP 2
  This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.
  Selecting FLAP 2 instead of FLAP 3 permits VMAX display on PFD to be increased.
- **If FLAPS = 3:**
  FOR LDG..USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
- **If FLAPS > 3:**
  FOR LDG...USE FLAP FULL
  This line is replaced by "FOR LDG: USE FLAP FULL" when CONF FULL is selected, as a reminder.

LDG DIST PROC.. APPLY

INOP SYS

FLAPS

Continued on the following page

F/CTL FLAPS FAULT/LOCKED (Cont'd)

FUEL CONSUMPT INCRSD

See [1]

FMS PRED UNRELIABLE

See [2]

---

[1] *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

[2] *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL FLAP LVR NOT ZERO

Applicable to: ALL

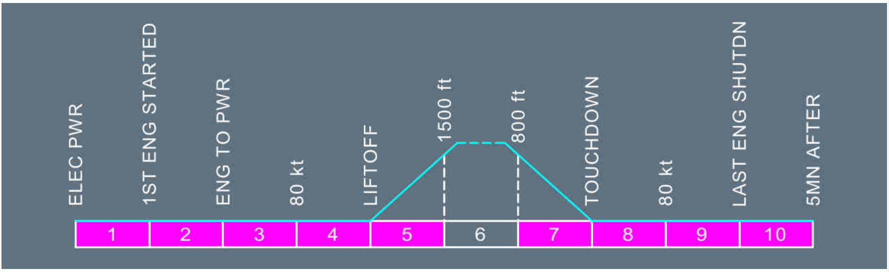
Ident.: PRO-ABN-F_CTL-AO-00019399.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

This alert triggers when the slat or flap lever is not in the zero position and altitude is above 22 000 ft.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-AO-00019053.0001001 / 21 MAR 16

Crew awareness.

F/CTL FLAP SYS 1(2) FAULT

Applicable to: ALL

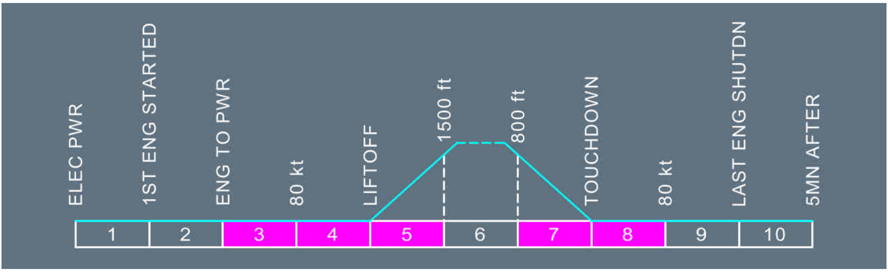
Ident.: PRO-ABN-F_CTL-B-00017545.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of flap channel in one SFCC.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-B-00010345.0001001 / 25 FEB 14

Crew awareness.

Continued on the following page

F/CTL FLAP SYS 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-B-00010346.0001001 / 05 JUN 18

L12

STATUS

APPR PROC

● **In case of FLAP SYS 1 FAULT:**

GPWS FLAP MODE...OFF

Flap position signal to GPWS is lost.

Note: If the GPWS FLAP MODE is selected OFF when the aircraft airspeed is above 250 kt, the FAULT light of the GPWS SYS pb-sw comes on. Only the GPWS modes that require flap information are lost (i.e. mode 2A and mode 4B).

FLAPS SLOW

F/CTL FLAP/MCDU DISAGREE

Applicable to: ALL

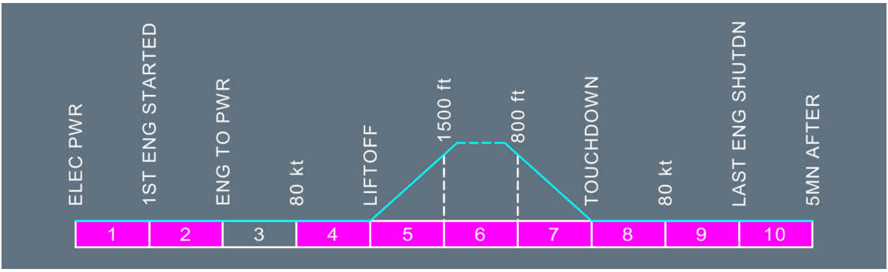
Ident.: PRO-ABN-F_CTL-AP-00017542.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This caution is triggered when pressing the T.O CONFIG TEST pb in phase 2 or at takeoff initiation if the flap lever position and the FLAPS position as entered on the MCDU PERF T.O Page are different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

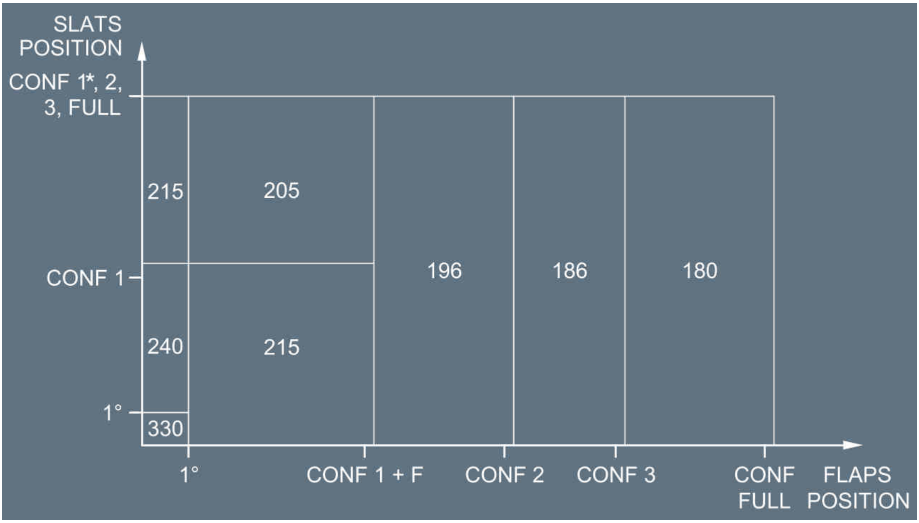
Ident.: PRO-ABN-F_CTL-AP-00019054.0001001 / 21 MAR 16

Crew awareness.

F/CTL FLAPS/SLATS FAULT/LOCKED

Ident.: PRO-ABN-F_CTL-00019058.0001001 / 01 MAR 18
Applicable to: ALL

This figure gives the MAX SPEED value displayed on ECAM in case of failure for all Slats/Flaps positions.



VLS					
	0 ≤ Flaps < 1+F	**1+F ≤ Flaps < 2**	**2 ≤ Flaps < 3**	**3 ≤ Flaps < FULL**	**Flaps FULL**
0 ≤ Slats < 1	VREF + 50	VREF + 40	VREF + 30	VREF + 25	VREF + 25
1 ≤ Slats < 2	VREF + 30	VREF + 20	VREF + 15	VREF + 10	VREF + 10
Slats = 2	VREF + 30	VREF + 15	VREF + 10	VREF + 5	VREF

CAUTION For flight with SLATS or FLAPS extended, fuel consumption is increased. Refer to fuel flow indication.
As a guideline, determine the fuel consumption in clean configuration at same altitude without airspeed limitation (e.g. from ALTERNATE FLIGHT PLANNING tables, Refer to PER-FPL-FLP-ALN-20 ALTERNATE PLANNING - ISA) and multiply this result by the applicable Fuel Penalty Factor provided in the QRH (Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table) to give the fuel penalty required to reach the destination in the current configuration.

F/CTL GND SPLR NOT ARMED

Applicable to: ALL

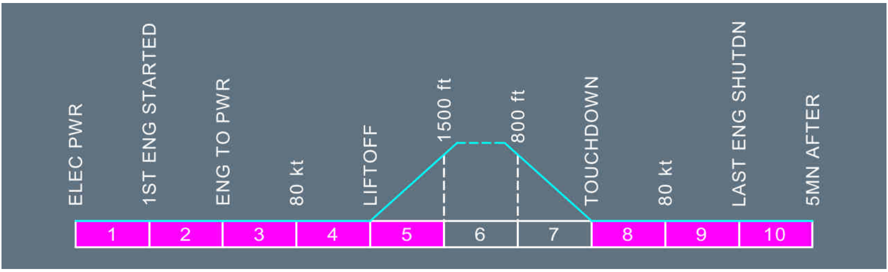
Ident.: PRO-ABN-F_CTL-AR-00017618.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ground spoilers are not armed before landing.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
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Ident.: PRO-ABN-F_CTL-AR-00019059.0001001 / 21 MAR 16

Crew awareness.

F/CTL GND SPLR FAULT

Applicable to: ALL

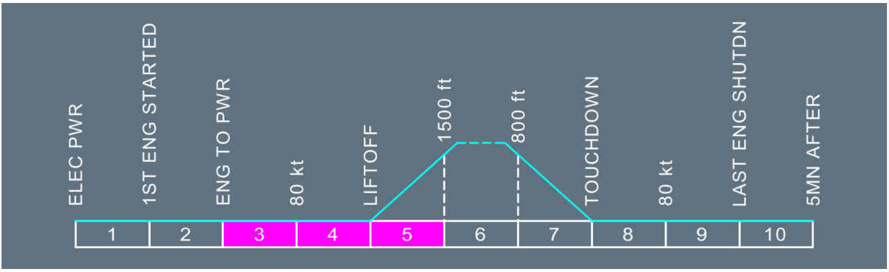
Ident.: PRO-ABN-F_CTL-N-00017619.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is loss of ground spoiler function in all PRIM computers.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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5
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8
9
10

Ident.: PRO-ABN-F_CTL-N-00019060.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-F_CTL-N-00019344.0002001 / 21 MAR 16

STATUS

LDG DIST PROC.. APPLY

INOP SYS

GND SPLRS
AUTO BRK

F/CTL L(R) ELEV FAULT

Applicable to: ALL

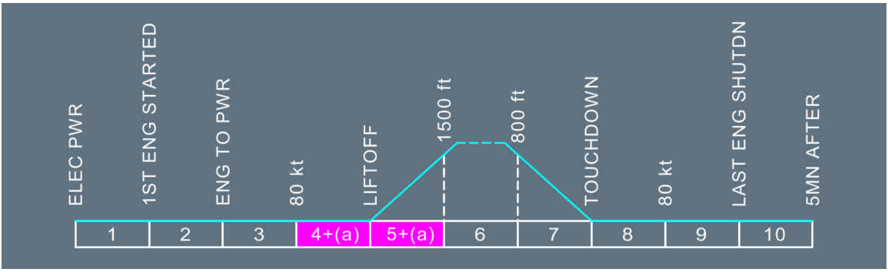
Ident.: PRO-ABN-F_CTL-Q-00017621.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is loss of both servojacks on one elevator.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
8
9
10

Note: (a) Inhibited between V1 and lift-off + 15 s.

Ident.: PRO-ABN-F_CTL-Q-00019070.0002001 / 22 MAR 17

SPD BRK.....DO NOT USE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

MAX SPEED.....330/.82

Continued on the following page

F/CTL L(R) ELEV FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-Q-00019071.0006001 / 21 MAR 16

L12

STATUS

SPD BRK....................DO NOT USE
MAX SPEED....................330/.82

APPR PROC

- **If elevator oscillation detected:**
  AP....................OFF

GPWS FLAP MODE....................OFF
FOR LDG....................USE FLAP 2

This line is replaced by “FOR LDG: USE FLAP 2” when CONF 2 is selected, as a reminder.

APPR SPD....................VLS + 10 KT

LDG DIST PROC....................APPLY

ALTN LAW: PROT LOST

INOP SYS

F/CTL PROT
AP 1 + 2 (1)
L (R) ELEV
CAT 2 (1)

(1) *(Not displayed, in case the elevator is frozen at zero, subsequent to elevator oscillation)*

F/CTL L+R ELEV FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

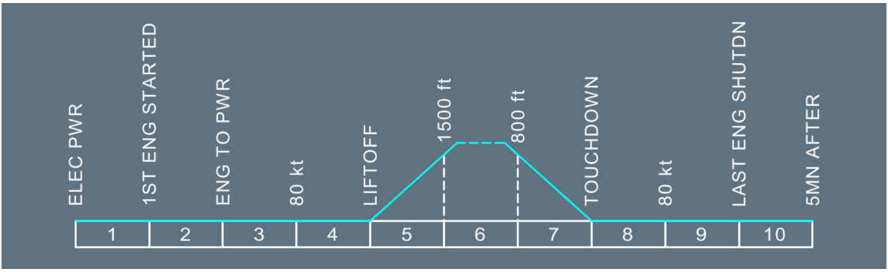
Ident.: PRO-ABN-F_CTL-S-00017622.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both elevators are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL L+R ELEV FAULT (Cont'd)

PITCH MECH BACK UP

A/THR..OFF
A/THR..DO NOT USE
SPD BRK..DO NOT USE

L2 *Do not use speed brakes, because it is difficult to control the induced pitch moment with manual pitch trim only.*

L1 MAX FL..REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MAX SPEED..305/.80

L2 *Due to loss of high speed protections.*

L1 MAN PITCH TRIM..USE

L2 *Only manual trim is available for pitch control. To improve the longitudinal control of the aircraft it is recommended to disconnect the autothrust.*

L1 MANEUVER WITH CARE

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE..FWD

L2 *Note: Fuel consumption is increased by approximately 1 %.*

L1
- **If the trim tank pump is inoperative or not installed:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**

    T TANK MODE..FWD

L2 *Note: Fuel consumption is increased by approximately 1 %.*

Continued on the following page

F/CTL L+R ELEV FAULT (Cont'd)

1 Ident.: PRO-ABN-F_CTL-S-00019073.0005001 / 12 JUL 18

L12

STATUS

A/THR....DO NOT USE
SPD BRK....DO NOT USE
MAX SPEED.... 305/.80
MANEUVER WITH CARE

APPR PROC

GPWS FLAP MODE.... OFF
FOR LDG.... USE FLAP 2

This line is replaced by “FOR LDG: USE FLAP 2” when CONF 2 is selected, as a reminder.
Do not select CONF FULL so as not to degrade handling qualities.

APPR SPD....VLS + 10 KT

MAN PITCH TRIM.... USE

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**
    T TANK MODE.... FWD
- **If the trim tank pump is inoperative or not installed:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**
    T TANK MODE.... FWD

LDG DIST PROC.... APPLY

PITCH MECH BACK UP
ROLL DIRECT LAW

INOP SYS

L + R ELEV
F/CTL PROT
AP 1 + 2
CAT 2

F/CTL L+R ELEV FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

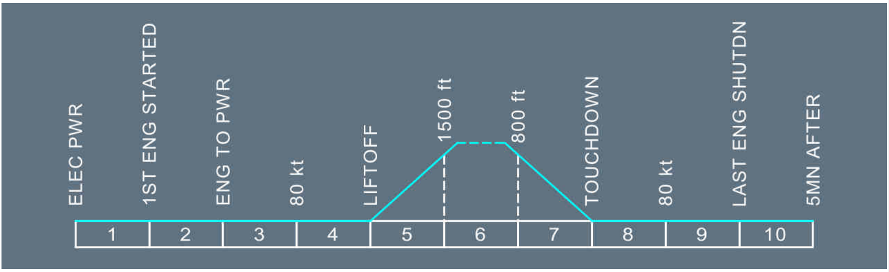
Ident.: PRO-ABN-F_CTL-S-00017622.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both elevators are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL L+R ELEV FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-S-00019072.0001001 / 21 MAR 16

PITCH MECH BACK UP

SPD BRK...DO NOT USE

L2 *Do not use speed brakes, because it is difficult to control the induced pitch moment with manual pitch trim only.*

L1 MAX SPEED...305/.80

L2 *Due to loss of high speed protections.*

L1 MAN PITCH TRIM...USE

L2 *Only manual trim is available for pitch control. To improve the longitudinal control of the aircraft it is recommended to disconnect the autothrust.*

L1 MANEUVER WITH CARE

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE...FWD

L2 *Note: Fuel consumption is increased by approximately 1 %.*

L1
- **If the trim tank pump is inoperative or not installed:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**

    T TANK MODE...FWD

L2 *Note: Fuel consumption is increased by approximately 1 %.*

Continued on the following page

F/CTL L+R ELEV FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-S-00019073.0003001 / 21 MAR 16

2

L12

STATUS

SPD BRK....................DO NOT USE
MAX SPEED....................305/.80
MANEUVER WITH CARE

APPR PROC

GPWS FLAP MODE....................OFF
FOR LDG....................USE FLAP 2

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.
Do not select CONF FULL so as not to degrade handling qualities.

APPR SPD....................VLS + 10 KT

MAN PITCH TRIM....................USE

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**
    T TANK MODE....................FWD
- **If the trim tank pump is inoperative or not installed:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**
    T TANK MODE....................FWD

LDG DIST PROC....................APPLY

PITCH MECH BACK UP
ROLL DIRECT LAW

INOP SYS

L + R ELEV
F/CTL PROT
AP 1 + 2
CAT 2

F/CTL L(R) INR(OUTR) AIL FAULT

Applicable to: ALL

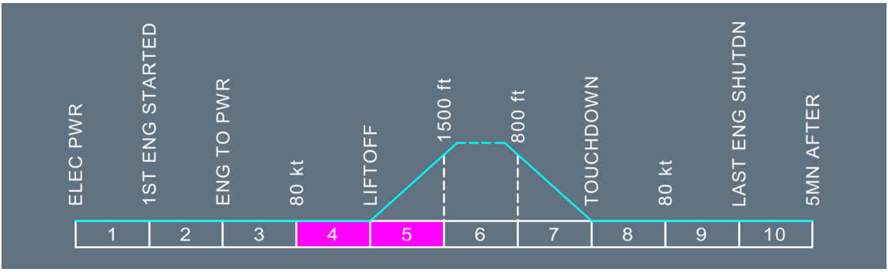
Ident.: PRO-ABN-F_CTL-V-00017623.0001001 / 02 MAY 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is loss of both servojacks on one aileron.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
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Ident.: PRO-ABN-F_CTL-V-00010397.0002001 / 22 AUG 13

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

F/CTL L(R) INR(OUTR) AIL FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-V-00019074.0002001 / 22 MAR 17

L12

STATUS

	INOP SYS
FUEL CONSUMPT INCRSD See (1) FMS PRED UNRELIABLE See (2)	L(R) OUTR (INR) AIL

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL L(R) SIDESTICK FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AS-00017624.0001001 / 21 MAR 16

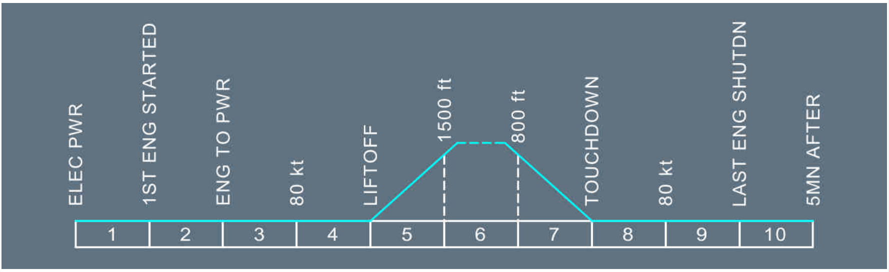
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the transducers on pitch or roll axis are failed on one sidestick.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

F/CTL L(R) SIDESTICK FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AS-00010349.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-AS-00019864.0001001 / 11 JUL 16

STATUS

INOP SYS

L(R) SIDESTICK

F/CTL FLAPS LEVER OUT OF DETENT

Applicable to: ALL

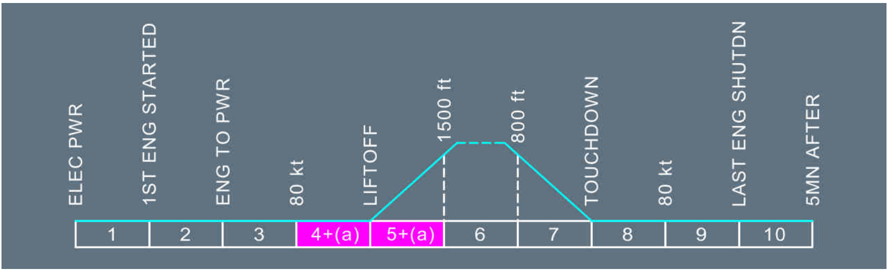
Ident.: PRO-ABN-F_CTL-AT-00017543.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the flap/slat lever is between two detents.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
8
9
10

Note: *(a) Inhibited between V1 and lift-off + 15 s.*

Continued on the following page

F/CTL FLAPS LEVER OUT OF DETENT (Cont'd)

Ident.: PRO-ABN-F_CTL-AT-00019075.0002001 / 21 MAR 16

Crew awareness.

F/CTL PEDAL SENSOR FAULT

Applicable to: ALL

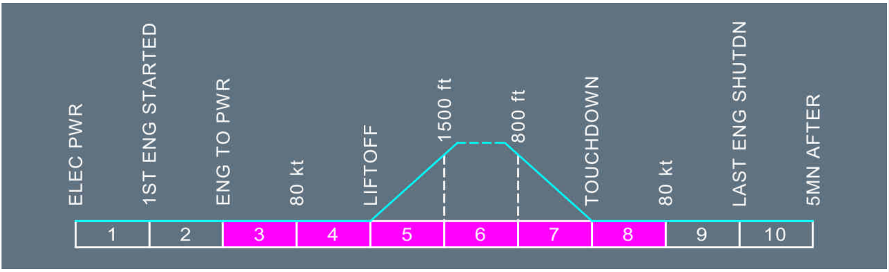
Ident.: PRO-ABN-F_CTL-AU-00017625.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alerts triggers when a failure affecting a pedal sensor is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
10

Ident.: PRO-ABN-F_CTL-AU-00019077.0001001 / 21 MAR 16

Crew awareness.

F/CTL PITCH TRIM/MCDU/CG DISAGREE

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AV-00017626.0004001 / 28 MAY 20

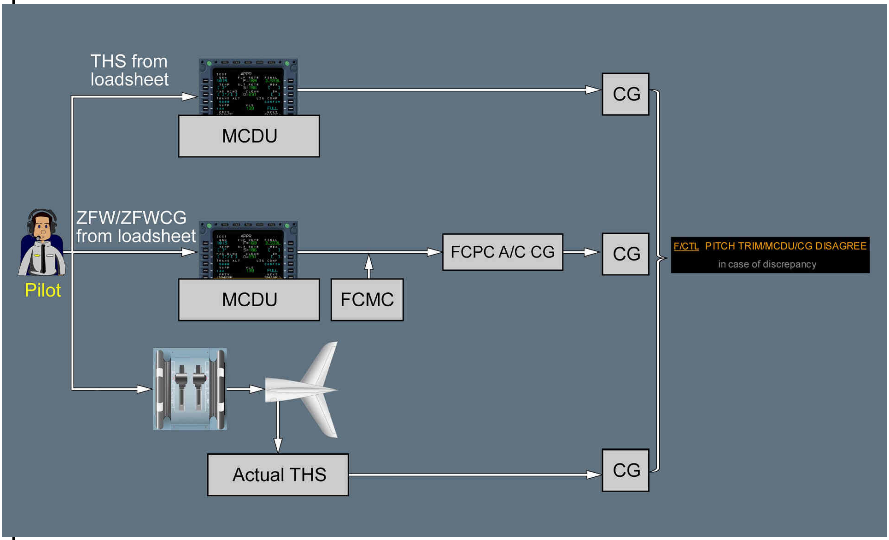
ANNUNCIATIONS

Triggering Conditions:

L2 When the TO CONFIG pb on the ECP is pressed, or when the thrust levers are set to FLEX or TOGA, there is a discrepancy between:

- The actual pitch trim value, and
- The pitch trim value entered by crew in the MCDU, and
- The pitch trim value calculated by the FCPC, based on the CG.

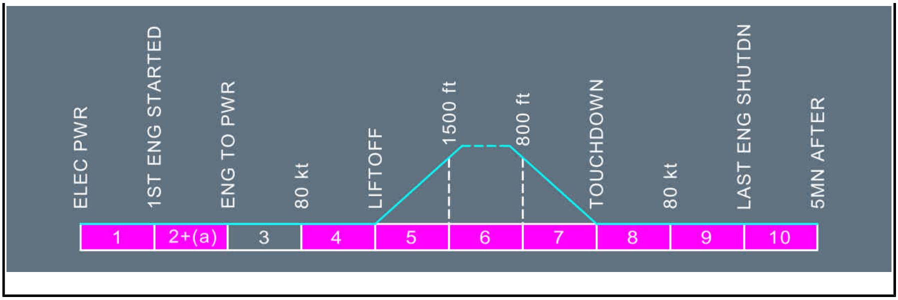
Pitch Trim / MCDU / CG Disagree


THS from loadsheet
MCDU
CG
ZFW/ZFWCG from loadsheet
Pilot
MCDU
FCMC
FCPC A/C CG
CG
F/CTL PITCH TRIM/MCDU/CG DISAGREE
in case of discrepancy
Actual THS
CG

Flight Phase Inhibition:

Continued on the following page

F/CTL PITCH TRIM/MCDU/CG DISAGREE (Cont'd)


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2+(a)
3
4
5
6
7
8
9
10

Note: *(a) Inhibited in flight phase 2 as long as T.O CONFIG pb is not depressed.*

Ident.: PRO-ABN-F_CTL-AV-00019078.0001001 / 03 AUG 18

Crew awareness.

L2 *Note:* *The flight crew checks the LOADSHEET data, the FMS entries and the trim setting.*

F/CTL PRIM 1(2)(3) FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

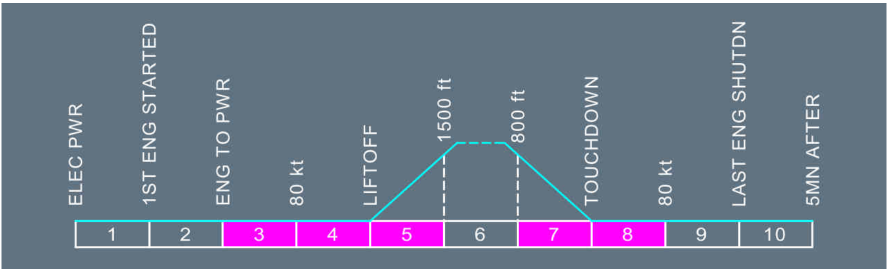
Ident.: PRO-ABN-F_CTL-F-00017628.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of one primary computer.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL PRIM 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-F-00019080.0013001 / 03 NOV 23

PRIM (AFFECTED).. OFF THEN ON

L2 *For additional information Refer to PRO-ABN-ABN-RST System Reset Table - F/CTL.*

L1 ● **IF UNSUCCESSFUL:**

PRIM (AFFECTED).. OFF

L2 *In the case of all PRIM failure, the steering handwheel remains available to steer the aircraft during taxi.*

L1 ● **In the case of dual PRIM failure:**

SPD BRK.. DO NOT USE

L2 *In the case of a third PRIM failure: If the speed brakes are out, they immediately retract, inducing a strong pitch down effect.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE.. FWD

    Note: *Fuel consumption is increased by approximately 1 %.*
- **If the trim tank pump is inoperative:**
  - **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**

    T TANK MODE.. FWD

    Note: *Fuel consumption is increased by approximately 1 %.*

Continued on the following page

F/CTL PRIM 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-F-00019081.0017001 / 03 NOV 23

L12

STATUS

- **In the case of an all PRIM failure:**

  RUD WITH CARE ABV 160 KT

  The rudder travel limit value is frozen at the value it had at the moment the failure occurred. Therefore, rudder inputs must be limited at the speed above 160 kt, so as not to damage the structure. At slats extension, full rudder travel authority is recovered.

- **In the case of a dual or an all PRIM failure:**

  SPD BRK...DO NOT USE

  - **If the trim tank pump is operative:**
    - **IF CG AFT 32%:**

      T TANK MODE..FWD

  - **If the trim tank pump is inoperative, or not installed:**
    - **IF CG AFT 32% AND WHEN SPD > 270KT AND NOT IN CLIMB:**

      T TANK MODE..FWD

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (5)

FMS PRED UNRELIABLE

See (6)

CAT 3 SINGLE ONLY

(If PRIM 1 failure)

INOP SYS

PRIM 1(2)(3)
PART (HALF, MOST) SPLRS
CAT 3 DUAL (1)
REVERSERS (2)
SPD BRK (3)
GND SPLRS (3)
AP 1+2 (3)
RUD TRV LIM (3)
AUTO BRK (4)

Other INOP SYS

NWS control via rudder pedals (all PRIM failure)

(1) *(if PRIM 1 failure)*
(2) *(if PRIM 1+3 failure)*
(3) *(all PRIM failure)*
(4) *(if dual PRIM failure)*

Continued on the following page

F/CTL PRIM 1(2)(3) FAULT (Cont'd)

(5) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(6) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL PRIM 1(2)(3) FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

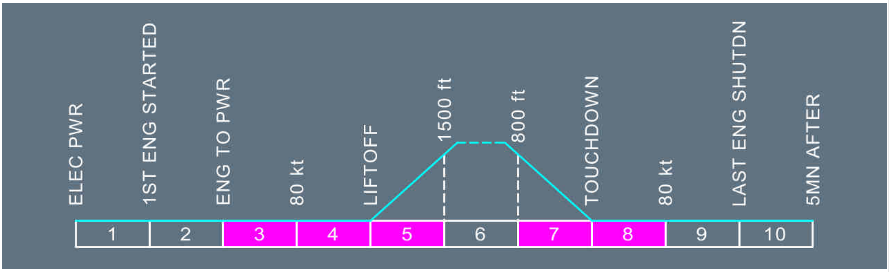
Ident.: PRO-ABN-F_CTL-F-00017628.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of one primary computer.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL PRIM 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-F-00019080.0002001 / 05 MAY 22

PRIM (AFFECTED).. OFF THEN ON

L2 *For additional information Refer to PRO-ABN-ABN-RST System Reset Table - F/CTL.*

L1 ● **IF UNSUCCESSFUL:**

PRIM (AFFECTED)..OFF

L2 *In the case of all PRIM failure, the steering handwheel remains available to steer the aircraft during taxi.*

L1 ● **In the case of dual PRIM failure:**

SPD BRK.. DO NOT USE

L2 *In the case of a third PRIM failure: If the speed brakes are out, they immediately retract, inducing a strong pitch down effect.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE..FWD

    Note: Fuel consumption is increased by approximately 1 %.
- **If the trim tank pump is inoperative:**
  - **IF CG AFT 32 % AND WHEN SPEED > 270 KT AND NOT IN CLIMB:**

    T TANK MODE..FWD

    Note: Fuel consumption is increased by approximately 1 %.

Continued on the following page

F/CTL PRIM 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-F-00019081.0015001 / 04 NOV 20

L12

STATUS

- **In case of an all PRIM failure:**

  RUD WITH CARE ABV 160 KT

  The rudder travel limit value is frozen at the value it had at the moment when the failure occurred. Therefore, rudder inputs must be limited at speeds above 160 kt, so as not to damage structure. At slats' extension, full rudder travel authority is recovered.

- **In case of a dual or an all PRIM failure:**

  SPD BRK..DO NOT USE

  - **If the trim tank pump is operative:**
    - **IF CG AFT 32%:**

      T TANK MODE..FWD
  - **If the trim tank pump is inoperative, or not installed:**
    - **IF CG AFT 32% AND WHEN SPEED > 270KT AND NOT IN CLIMB:**

      T TANK MODE..FWD

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (5)

FMS PRED UNRELIABLE

See (6)

CAT 3 SINGLE ONLY

(if PRIM 1 failure)

INOP SYS

PRIM 1(2)(3)
PART (HALF, MOST) SPLRS
CAT 3 DUAL (1)
REVERSERS (2)
SPD BRK (3)
GND SPLRS (3)
AP 1+2 (3)
RUD TRV LIM (3)
AUTO BRK (4)

Other INOP SYS

NWS control via rudder pedals (all PRIM failure)

---

(1) *(if PRIM 1 failure)*
(2) *(if PRIM 1+3 failure)*
(3) *(all PRIM failure)*
(4) *(if dual PRIM failure)*

Continued on the following page

F/CTL PRIM 1(2)(3) FAULT (Cont'd)

(5) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(6) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

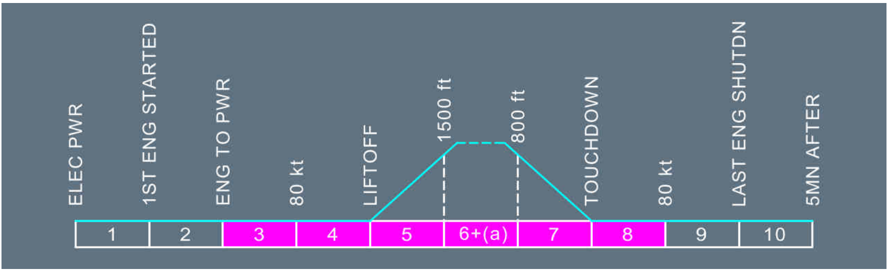
F/CTL RUD PRIM (SEC) 1 FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AZ-00017633.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6+(a)
7
8
9
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L2 Note: *(a) Only for RUD SEC 1 FAULT alert.*

Ident.: PRO-ABN-F_CTL-AZ-00019091.0001001 / 21 MAR 16

Crew awareness.

F/CTL PRIM 1(2)(3) (SEC1)(2) PITCH FAULT

Applicable to: ALL

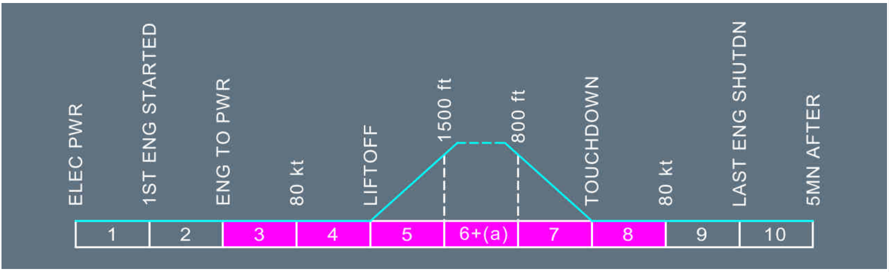
Ident.: PRO-ABN-F_CTL-AC-00017627.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure of the pitch channel in the associated computer.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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6+(a)
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Note: (a) Only for SEC 1(2) PITCH FAULT alert.

Ident.: PRO-ABN-F_CTL-AC-00019079.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-F_CTL-AC-00010417.0001001 / 21 NOV 11

STATUS

	INOP SYS
● **IF F/CTL PRIM1 PITCH FAULT** CAT 3 SINGLE ONLY	CAT 3 DUAL [(1)]

(1) *(IF F/CTL PRIM1 PITCH FAULT)*

F/CTL RUD B(Y)(G) SERVO FAULT

Applicable to: ALL

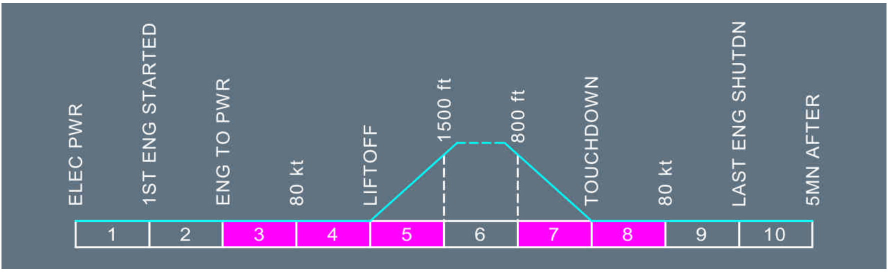
Ident.: PRO-ABN-F_CTL-AW-00017629.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the blue, green, or yellow rudder servojack is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-AW-00019083.0001001 / 21 MAR 16

Crew awareness.

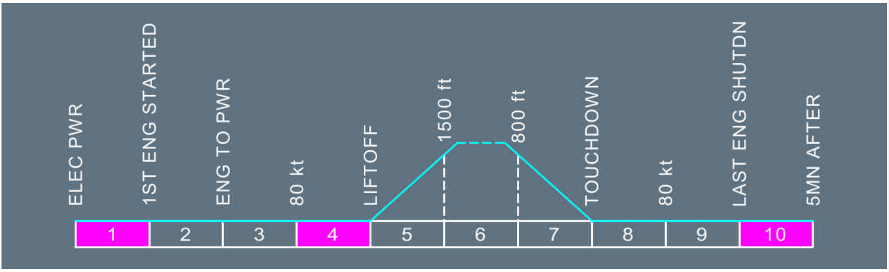
F/CTL RUD NORM CTL FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AG-00017631.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-AG-00019086.0007001 / 21 MAR 16

USE RUD FOR TURN COORD
RUD WITH CARE ABV 160 KT

L2 *The backup control module takes over the rudder control but cannot ensure the rudder travel limit function. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. However, aerodynamic limitations ensure that excessive load cannot be reached on the rudder.*

Ident.: PRO-ABN-F_CTL-AG-00019088.0007001 / 21 MAR 16

L12

STATUS

	INOP SYS
RUD WITH CARE ABV 160 KT	GLS AUTOLAND ⊲✱
USE RUD FOR TURN COORD	
RUD BACKUP CTL *See* (1)	

(1) *Rudder via the rudder backup module.*

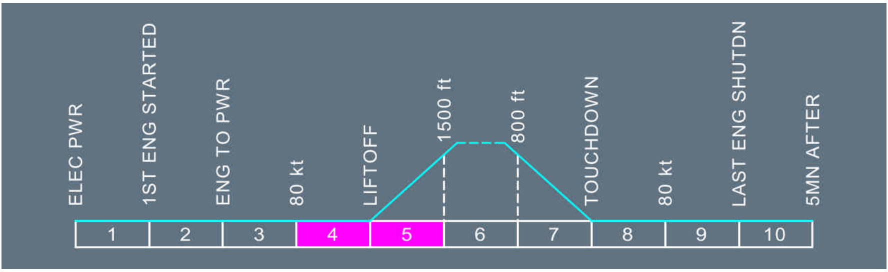
F/CTL RUD PEDAL FAULT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-AF-00017632.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-AF-00019089.0001001 / 21 MAR 16

MAX X WIND FOR LDG: 15 KT

- **AT LDG ROLL:**
  DIFF BRAKING.. AS RQRD

Continued on the following page

F/CTL RUD PEDAL FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AF-00019090.0006001 / 21 MAR 16

L12

STATUS

MAX X WIND FOR LDG: 15 KT

APPR PROC

- **BEFORE AUTOLAND:**
  RUD TRIM (AP OFF).. RESET
  Manual landing is preferred, however autoland can be performed.
  The autopilot normally adjusts the rudder trim by comparing the rudder trim command with the feedback on the rudder pedal. As the rudder pedal is faulty, the autopilot cannot apply rudder trim on the rudder surface, but it still internally computes rudder trim up to its maximum value. During the flight, the AP maintains the correct flight path, necessary by a permanent rudder deflection (as the AP' trim order would have done).
  However, just before landing, during the align mode, the computed maximum rudder trim is added to the rudder demand and could cause lateral deviation. To prevent this, the rudder trim must be reset to its zero position, before the align mode, at around 1 000 ft.
  To perform this reset, the autopilot must be disconnected and then reconnected to perform the autoland.
- **AT LDG ROLL:**
  DIFF BRAKING..AS RQRD

INOP SYS

RUD PEDAL
RUD TRIM

Loss of nosewheel steering via the pedals ; however, it remains available using the handwheel.
The rudder may be deflected by the yaw damper.

F/CTL RUD TRIM 1(2) FAULT

Applicable to: ALL

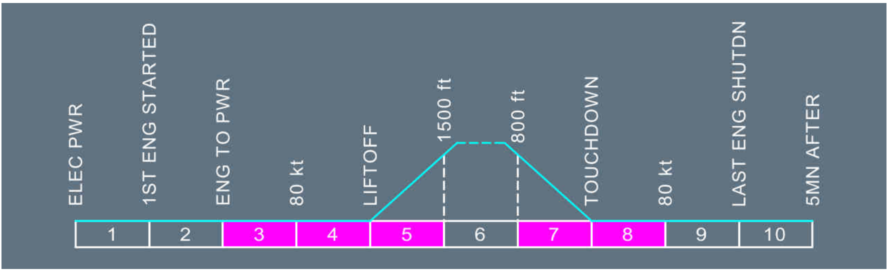
Ident.: PRO-ABN-F_CTL-Y-00017634.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure of the rudder trim 1(2).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-Y-00010404.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-Y-00019123.0001001 / 21 MAR 16

STATUS

CAT 3 SINGLE ONLY

INOP SYS

RUD TRIM 1(2)
CAT 3 DUAL

F/CTL RUD TRIM FAULT

Applicable to: ALL

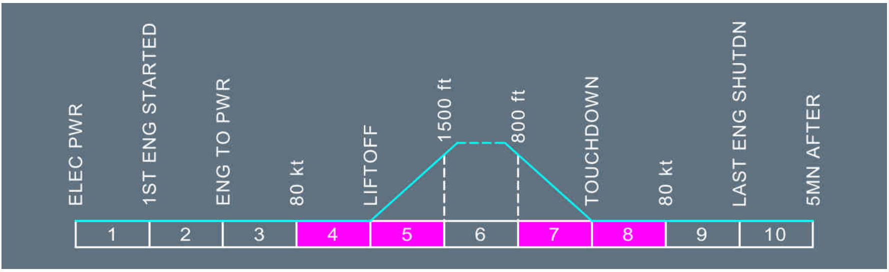
Ident.: PRO-ABN-F_CTL-Z-00017635.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a failure of the rudder trim 1 and 2.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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5
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Ident.: PRO-ABN-F_CTL-Z-00010406.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-Z-00019124.0001001 / 21 MAR 16

STATUS

INOP SYS

RUD TRIM
AP 1 + 2
CAT 2

F/CTL RUDDER FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

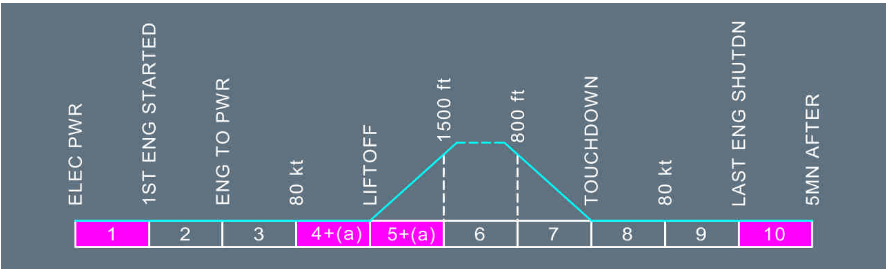
Ident.: PRO-ABN-F_CTL-AE-00017638.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the rudder is detected to be faulty, or jammed, in the 0 ° position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
8
9
10

Note: *(a) Inhibited between V1 and lift-off + 15 s.*

Ident.: PRO-ABN-F_CTL-AE-00019135.0002001 / 13 DEC 17

MANEUVER WITH CARE
MAX X WIND FOR LDG: 15 KT

- **If rudder is not jammed in position zero:**
  - **AT LDG ROLL:**
    DIFF BRAKING....AS RQRD
- **If rudder is jammed in position zero:**
  - **AT LDG ROLL:**
    DIFF BRAKING....USE ASAP

Continued on the following page

F/CTL RUDDER FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AE-00019136.0009001 / 13 DEC 17

L12

STATUS

MANEUVER WITH CARE
MAX X WIND FOR LDG: 15 KT

APPR PROC (ALL ENGINES OPERATIVE)

GPWS FLAP MODE...OFF
FOR LDG...USE FLAP 2

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

APPR SPD...VLS + 15 KT
SPD&TRAJ...STABILIZE ASAP

- **If rudder is not jammed in position zero:**
  - **AT LDG ROLL:**
    DIFF BRAKING.. AS RQRD
- **If rudder is jammed in position zero:**
  - **AT LDG ROLL:**
    DIFF BRAKING.......................................USE ASAP

LDG DIST PROC.. APPLY

APPR PROC (IF ONE ENGINE SHUT DOWN)

GPWS FLAP MODE...OFF
AP...OFF
A/THR..OFF
FOR LDG...USE FLAP 2

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

APPR SPD...170 KT
SPD&TRAJ...STABILIZE ASAP

- **IN CASE OF GO AROUND:**
  SPD... SELECT 170 KT

INOP SYS

RUDDER
AP 1 + 2
RUD TRIM
CAT 2
GLS AUTOLAND ◁

Continued on the following page

F/CTL RUDDER FAULT (Cont'd)

- **If rudder is not jammed in position zero:**
  - **AT LDG ROLL:**
    DIFF BRAKING.. AS RQRD
- **If rudder is jammed in position zero:**
  - **AT LDG ROLL:**
    DIFF BRAKING..USE ASAP

LDG DIST PROC.. APPLY

F/CTL RUDDER FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

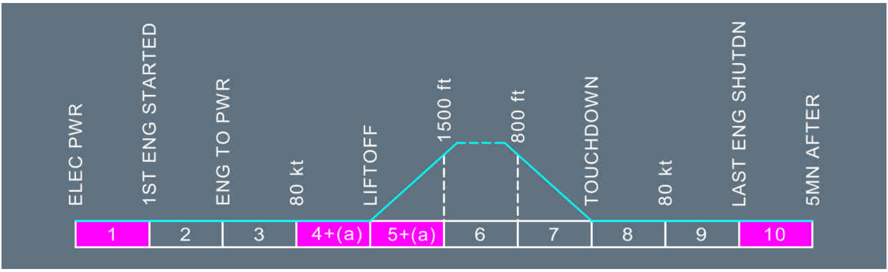
Ident.: PRO-ABN-F_CTL-AE-00017638.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the rudder is detected to be faulty, or jammed, in the 0 ° position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4+(a)
5+(a)
6
7
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Note: (a) Inhibited between V1 and lift-off + 15 s.

Continued on the following page

F/CTL RUDDER FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AE-00019135.0001001 / 21 MAR 16

MAX X WIND FOR LDG: 15 KT

- **AT LDG ROLL:**
  DIFF BRAKING.. AS RQRD

Ident.: PRO-ABN-F_CTL-AE-00019136.0008001 / 21 MAR 16

L12

STATUS

MAX X WIND FOR LDG: 15 KT

APPR PROC (ALL ENGINES OPERATIVE)

GPWS FLAP MODE.. OFF
FOR LDG.. USE FLAP 2

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

LDG DIST PROC.. APPLY

- **AT LDG ROLL:**
  DIFF BRAKING.. AS RQRD

APPR PROC (IF ONE ENGINE SHUTDOWN)

GPWS FLAP MODE.. OFF
A/THR.. OFF
FOR LDG.. USE FLAP 2

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

APPR SPD.. 170 KT

- **IN CASE OF GO AROUND:**
  SPD.. 170 KT

LDG DIST PROC.. APPLY

- **AT LDG ROLL:**
  DIFF BRAKING.. AS RQRD

INOP SYS

RUDDER
AP 1 + 2
RUD TRIM
CAT 2
GLS AUTOLAND ⋞

F/CTL SEC 1(2) FAULT

Applicable to: ALL

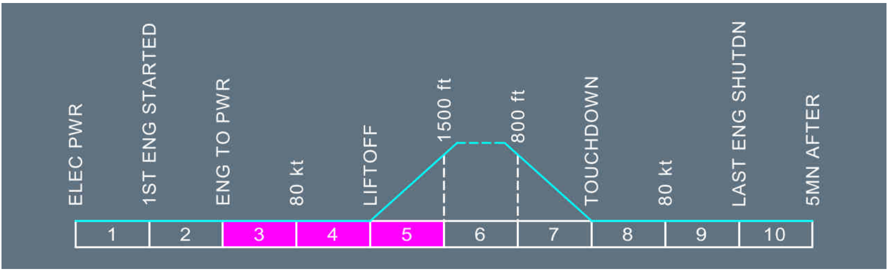
Ident.: PRO-ABN-F_CTL-G-00017639.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of one secondary computer.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-G-00019138.0008001 / 21 MAR 16

SEC (AFFECTED)...OFF THEN ON

- **IF UNSUCCESSFUL:**

  SEC (AFFECTED)...OFF

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

Ident.: PRO-ABN-F_CTL-G-00019152.0012001 / 17 MAR 17

L12

STATUS

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (3)

FMS PRED UNRELIABLE

See (4)

CAT 3 SINGLE ONLY

INOP SYS

PART SPLRS
SEC 1 (2)
CAT 3 DUAL
AP 1+2 (1)
RUD TRIM 1 (2) (2)
CAT 2 (1)
GLS AUTOLAND ◁✱ (1)
RUD TRIM (1)

(1) *(In case of a dual SEC failure)*

(2) *(In case of a single SEC failure)*

(3) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(4) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL SENSOR FAULT

Applicable to: ALL

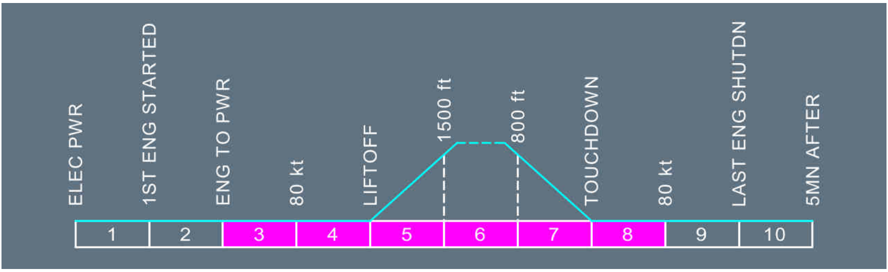
Ident.: PRO-ABN-F_CTL-BA-00017640.0002001 / 11 JUL 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of any sensor of flight control system.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-BA-00019161.0001001 / 21 MAR 16

Crew awareness.

F/CTL SLAT (FLAP) TIP BRK FAULT

Applicable to: ALL

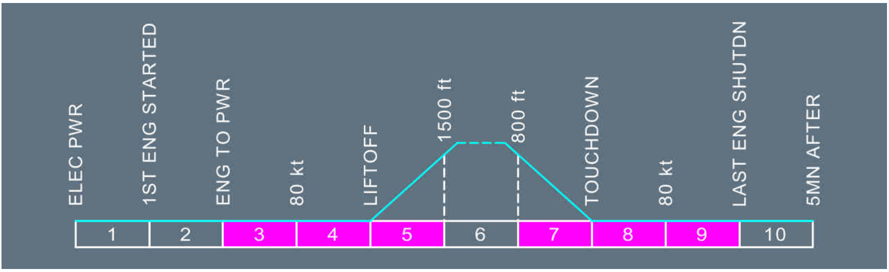
Ident.: PRO-ABN-F_CTL-C-00017546.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of one wing tip brake on the slats or flaps.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-C-00019163.0001001 / 21 MAR 16

Crew awareness.

L2 Note: *The SLAT (FLAP) TIP BRK FAULT warning is also triggered when the automatic test has not been performed during the last 10 days. If the clock is readjusted for a value above 10 days, maintenance must perform the Wing Tip Brake engagement test.*
This warning being classified as a NO GO item in the MMEL it will have to be cleared before the next flight. This can be done on the ground by manually launching the WTB engagement test accessing the CMS through the MCDU.

Ident.: PRO-ABN-F_CTL-C-00010348.0001001 / 05 AUG 10

STATUS

SLATS (FLAPS) SLOW

F/CTL SLAT SYS 1(2) FAULT

Applicable to: ALL

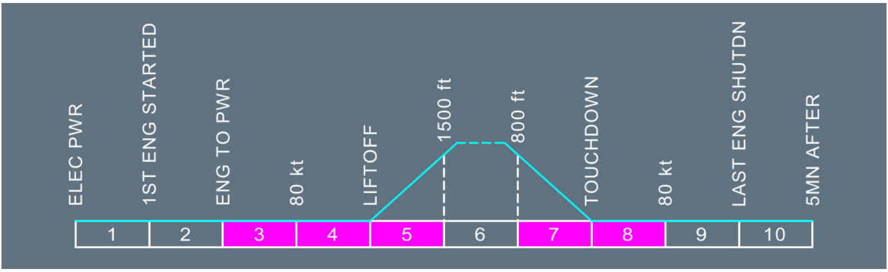
Ident.: PRO-ABN-F_CTL-A-00017544.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is failure of slat channel in one SFCC.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-A-00010343.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-F_CTL-A-00010344.0001001 / 05 AUG 10

STATUS

SLATS SLOW

F/CTL SLATS FAULT/LOCKED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

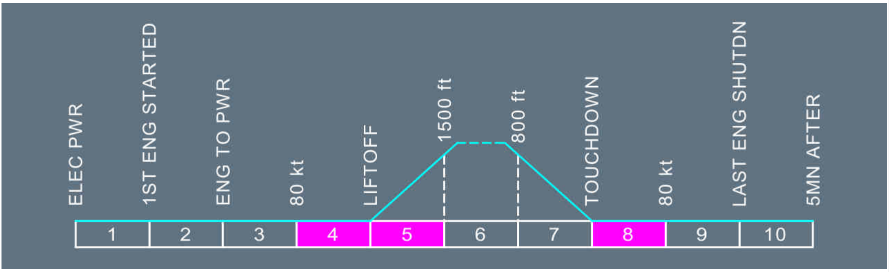
Ident.: PRO-ABN-F_CTL-D-00017541.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The SLATS FAULT alert triggers when there is a failure of both slats channels.
The SLATS LOCKED alert triggers when the slats wing tip brakes are activated.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-D-00010351.0002001 / 03 NOV 22

L2 For landing with slats jammed, see OPERATING TECHNIQUES (*Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed*).

L1
L2 The autopilot may be used down to 500 ft AGL. As it is not tuned for the abnormal configurations, its behavior can be less than optimum and must be monitored.

L1 MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited to the VFE corresponding to the next slat position.*

L1 ● **WHEN SPEED BELOW VFE:**

FLAPS LEVER (IF SLATS NOT LOCKED)..RECYCLE

L2 *Return to the previous selection, then back to the desired position.*

L1 *Note:* *If there is a F/CTL SLATS FAULT after a dual SFCC failure, ALTN law becomes active (Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST)). Speed limits are lost on PFD.*

● **If slats extended:**

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED..330/0.82

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

L12

STATUS

MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

APPR PROC

- **If SLATS < 2:**

  GPWS FLAP MODE..OFF

- **If slats and flaps are jammed in CONF 0:**

  NO S/F LDG PROC...APPLY

  Refer to PRO-ABN-F_CTL [QRH] No Flaps no Slats Landing.

  FOR LDG..USE FLAP 1

  This line is displayed if both SFCCs are lost and F/CTL SLATS FAULT is displayed. This line is replaced by "FOR LDG: USE FLAP 1" when CONF 1 is selected, as a reminder. Selecting FLAP 1 will not result in flaps/slats extension but will enable the engagement of the SRS guidance mode in the case of go-around.

- **If slats and flaps are not jammed in CONF 0:**

  S/F JAMMED PROC...APPLY

  Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.

Note: *The ECAM procedure (below) just provides the final flap lever selection for landing, depending on the failed slats position.*

- **If SLATS < 2:**

  FOR LDG..USE FLAP 2

  This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

INOP SYS

SLATS
CAT 2

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

■ **If SLATS ≥ 2:**

FOR LDG..USE FLAP 3

This line is replaced by “FOR LDG: USE FLAP 3” when CONF 3 is selected, as a reminder. Do not select CONF FULL as it will degrade handling qualities.

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL SLATS FAULT/LOCKED

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

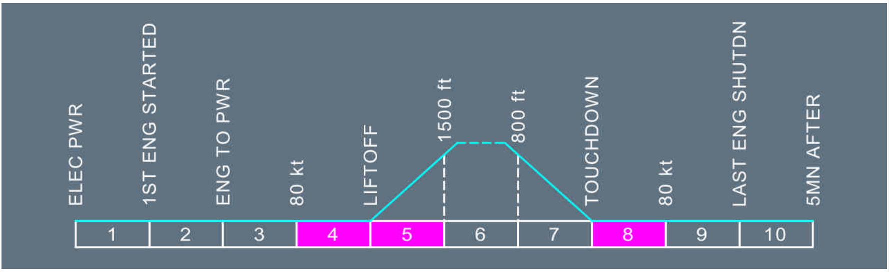
Ident.: PRO-ABN-F_CTL-D-00017541.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The SLATS FAULT alert triggers when there is a failure of both slats channels.
The SLATS LOCKED alert triggers when the slats wing tip brakes are activated.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

Ident.: PRO-ABN-F_CTL-D-00010351.0002001 / 03 NOV 22

L2 For landing with slats jammed, see OPERATING TECHNIQUES (*Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed*).

L1 L2 The autopilot may be used down to 500 ft AGL. As it is not tuned for the abnormal configurations, its behavior can be less than optimum and must be monitored.

L1 MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited to the VFE corresponding to the next slat position.*

L1
- **WHEN SPEED BELOW VFE:**

  FLAPS LEVER (IF SLATS NOT LOCKED)..RECYCLE

L2 *Return to the previous selection, then back to the desired position.*

L1 *Note:* *If there is a F/CTL SLATS FAULT after a dual SFCC failure, ALTN law becomes active (Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST)). Speed limits are lost on PFD.*

- **If slats extended:**

  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED..330/0.82

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

L12

STATUS

MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

APPR PROC

- **If SLATS < 2:**
  GPWS FLAP MODE..OFF

S/F JAMMED PROC.. APPLY

Refer to QRH/ABN-18 Landing with Slats or Flaps Jammed or Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed for managing the approach, and be prepared for a go-around.

Note: *The ECAM procedure (below) just provides the final flap lever selection for landing, depending on the failed slats position.*

- **If SLATS < 2:**
  FOR LDG...USE FLAP 2
  This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.
- **If SLATS ≥ 2:**
  FOR LDG...USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
  Do not select CONF FULL so as not to degrade handling qualities.

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See [(1)]

FMS PRED UNRELIABLE

INOP SYS

SLATS

Continued on the following page

F/CTL SLATS FAULT/LOCKED (Cont'd)

See (2)

(1) This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.

(2) Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.

F/CTL SPD BRK DISAGREE

Applicable to: ALL

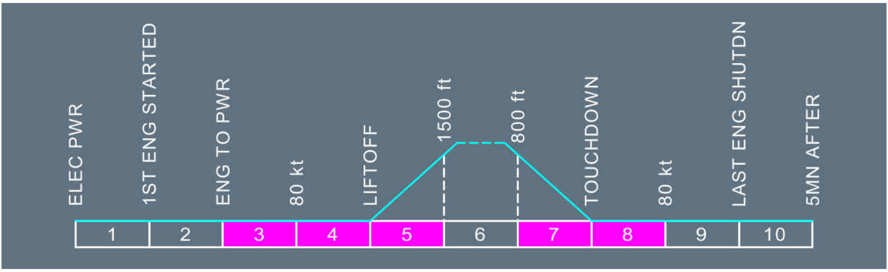
Ident.: PRO-ABN-F_CTL-P-00017641.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the position disagrees between surfaces and handle position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-P-00019165.0001001 / 21 MAR 16

SPD BRK LEVER....................RETRACT
SPD BRK....................DO NOT USE

Continued on the following page

F/CTL SPD BRK DISAGREE (Cont'd)

Ident.: PRO-ABN-F_CTL-P-00010383.0001001 / 05 AUG 10

STATUS

SPD BRK..DO NOT USE

F/CTL SPD BRK FAULT

Applicable to: ALL

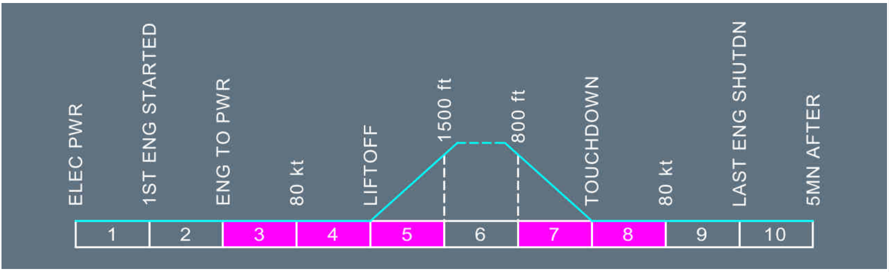
Ident.: PRO-ABN-F_CTL-O-00017642.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the speedbrakes lever transducers to all PRIM failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-O-00010380.0001001 / 25 FEB 14

L2 Loss of speed brake surfaces, due to failure of speed brake lever transducer. In addition, associated ground spoilers are only available through reverse selection.

L1 Crew awareness.

Continued on the following page

F/CTL SPD BRK FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-O-00010381.0001001 / 05 AUG 10

STATUS

INOP SYS

SPD BRK

F/CTL SPD BRK STILL OUT

Applicable to: ALL

Ident.: PRO-ABN-F_CTL-BB-00017643.0002001 / 12 MAY 23

ANNUNCIATIONS

Triggering Conditions:

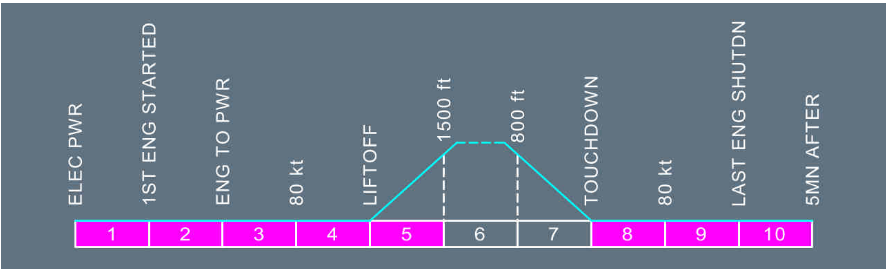
L2

This alert triggers when:

- In flight phase 6:
  - The SPEED BRK memo is displayed for more than 30 s, or
  - The SPEED BRK memo is displayed, and the AP/FD TCAS mode orders a nose-up TCAS RA maneuver, or
- In flight phase 7, the SPEED BRK memo is displayed.

For more information about the SPEED BRK memo display, *Refer to DSC-27-20-30 SPEED BRK*.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL SPD BRK STILL OUT (Cont'd)

Ident.: PRO-ABN-F_CTL-BB-00019174.0001001 / 21 MAR 16

Crew awareness.

F/CTL SPLR FAULT

Applicable to: ALL

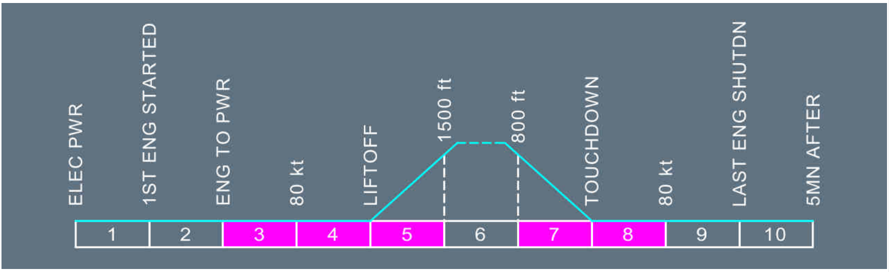
Ident.: PRO-ABN-F_CTL-M-00017644.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of one or more spoiler.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-M-00019176.0002001 / 21 MAR 16

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

F/CTL SPLR FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-M-00019182.0005001 / 21 MAR 16

L12

STATUS

APPR PROC	INOP SYS
APPR SPD....................VLS +10 KT LDG DIST PROC....................APPLY FUEL CONSUMPT INCRSD *See* (1) FMS PRED UNRELIABLE *See* (2)	PART (HALF, MOST, ALL) SPLRS

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

F/CTL STAB CTL FAULT

Applicable to: ALL

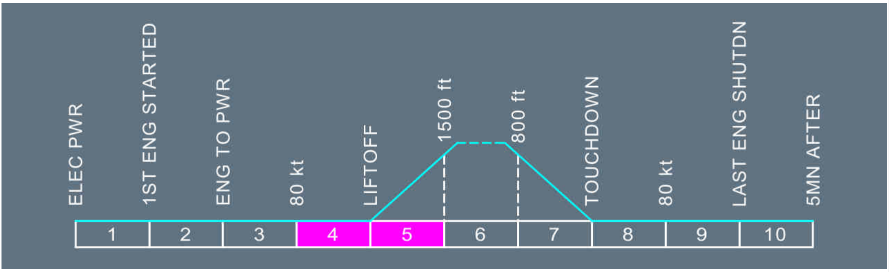
Ident.: PRO-ABN-F_CTL-L-00017645.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of the electrical control of the stabilizer.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

F/CTL STAB CTL FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-L-00019184.0002001 / 22 MAR 17

The PFD displays "USE MAN PITCH TRIM" in amber.

MAN PITCH TRIM.. CHECK

L2 *The force needed on the pitch trim wheel may be higher than usual (pre-takeoff manual setting).*

L1
- **IF MAN TRIM AVAIL:**

  TRIM FOR NEUTRAL ELEV

  L2 *If man pitch trim is available, trim to maintain elevator at zero position (indications on F/CTL SD page). To improve the longitudinal control of the aircraft, it is recommended to disconnect the autothrust.*

L1
- **IF TRIM LOCKED > 8 UP:**

  MAX SPEED.. 180 KT

  L2 *If trim is locked above 8 ° up, pitch down authority may not be sufficient for speed above 180 kt. Select configuration as appropriate - Fuel consumption is increased.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

MAX SPEED..330/.82

Continued on the following page

F/CTL STAB CTL FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-L-00019186.0002001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/.82

- **IF TRIM LOCKED > 8 UP:**

  MAX SPEED.. 180 KT

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- **IF MAN TRIM NOT AVAIL:**

  PITCH AUTHORITY REDUCED

  Start the flare slightly earlier. More stick deflection may be needed to achieve the flare

  GPWS FLAP MODE...OFF

  FOR LDG...USE FLAP 2

  This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

  Do not select CONF FULL or CONF 3 so as not to degrade handling qualities.

  APPR SPD.. VLS + 10 KT

LDG DIST PROC... APPLY

ALTN LAW: PROT LOST

INOP SYS

F/CTL PROT
AP 1 + 2
CAT 2

F/CTL TURB DAMP FAULT

Applicable to: ALL

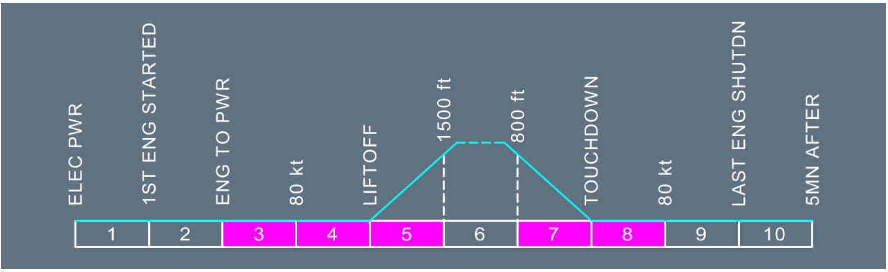
Ident.: PRO-ABN-F_CTL-AD-00017647.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the longitudinal or lateral turbulence damping is lost due to the accelerometer failure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-F_CTL-AD-00019188.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

F/CTL TURB DAMP FAULT (Cont'd)

Ident.: PRO-ABN-F_CTL-AD-00019191.0001001 / 21 MAR 16

L12

STATUS

INOP SYS

TURB DAMPER

Note: *When no alarm is given, but abnormal vibrations are present in non-turbulent conditions, this function may be disconnected via the TURB DAMP pb. Note the effect and report.*

[QRH] FUEL IMBALANCE

Ident.: PRO-ABN-FUEL-00011329.0001001 / 17 MAR 17
Applicable to: ALL

FOB.. CHECK

Compare the FOB + FU, with the FOB at departure.
If the difference is significant, or if the FOB + FU decreases, suspect a fuel leak.

CAUTION	1. A fuel imbalance may indicate a fuel leak. Do not apply this procedure, if a fuel leak is suspected. *Refer to PRO-ABN-FUEL [QRH] FUEL LEAK*. 2. In case of FUEL ENG FEEDLINE BURST alert followed by an engine shutdown, if fuel of the tank associated to the affected engine is required, DO NOT set the WING X FEED to ON.

WING X FEED... ON

- **If WING X FEED valve open:**
  - **On lighter side:**
    FUEL STBY PUMP.. OFF
    FUEL MAIN PUMP 1... OFF
    FUEL MAIN PUMP 2... OFF

    Note: *While pumps are OFF, disregard the corresponding FUEL WING PUMPS LO PR ECAM caution.*

  - **When fuel balanced:**
    FUEL MAIN PUMP 1... ON
    FUEL MAIN PUMP 2... ON
    FUEL STBY PUMP.. ON
    WING X FEED... AUTO

- **If WING X FEED valve failed closed or in case of FUEL ENG FEEDLINE BURST:**
  OUTR TK XFR.. ON
  This will connect the inner fuel tanks via the refuelling gallery.
  STRAIGHT FLIGHT.. MAINTAIN
  AP.. OFF
  Disconnect the Auto Pilot to reach the targeted bank angle and the appropriate rudder position during the maneuver.
  BANK ANGLE...3 DEG WING DOWN ON LIGHTER SIDE
  Fuel transfer only occurs if the bank angle is at, or above, 2 ° to 3 °.
  USE RUDDER TO KEEP HDG AND NEUTRAL STICK

Continued on the following page

[QRH] FUEL IMBALANCE (Cont'd)

Adjust rudder position to keep heading and neutral stick.

USE RUDDER TRIM

- **When transfer completed:**

  OUTR TK XFR.................... AUTO

  RESUME NORM BANK ANGLE

  RESUME NORM RUDDER TRIM

  AP.................... AS RQRD

[QRH] FUEL JETTISON

Applicable to: LV-KAN, LV-KAO

Ident.: PRO-ABN-FUEL-10-00025092.0003001 / 08 NOV 21

Fuel jettison is provided for quick reduction of aircraft weight in order to:

- Comply with the approach and landing climb requirements (not required, if the configuration is FLAP 3 for landing)
- Obtain the normal maximum landing weight (if time permits)
- Obtain the planned flight profile in the case of engine failure en route.

It is possible to jettison in any convenient configuration and at any speed. When feasible, the height should be sufficient to avoid contamination on the ground (5 000 ft AGL is considered as adequate).
Do not jettison in a thunderstorm.
When jettison is performed, avoid flying into the jettisoned flow (which is descending at about 500 ft/min).
Average weight reduction (by jettison only) is 1 000 kg/min (2 200 lb/min).

For the inhibition conditions of Jettison operation, please *Refer to DSC-28-10-120 General*.

Continued on the following page

[QRH] FUEL JETTISON (Cont'd)

Ident.: PRO-ABN-FUEL-10-00025093.0003001 / 08 NOV 21

AUTOMATIC MODE

ON MCDU:

FUEL PRED key....SELECT
JET GW....ENTER THE FINAL GW

ON OVERHEAD PANEL:

T TANK MODE....CHECK AUTO
JETTISON ARM....ON
JETTISON ACTIVE....ON

Note: *If FUEL T TANK XFR FAULT alert is triggered, disregard the ECAM procedure.*

CAUTION	*During jettison operation, monitor the CG.* *If either the forward or aft takeoff and landing limit is reached, stop jettison.*

L2 *In the case of jettison with landing gear down, there is no automatic trim tank transfer. Therefore, the flight crew may use manual trim tank transfer in order to maintain aircraft CG within limits.*

L1
- **When jettison is completed, or to manually stop jettison operation:**

  JETTISON ACTIVE....OFF
  JETTISON ARM....OFF

  Note:
  1. *Jettison operation is automatically stopped when actual GW reaches the value inserted in the MCDU.*
  2. *Automatic jettison can be restarted by re-entering JET GW.*

Continued on the following page

[QRH] FUEL JETTISON (Cont'd)

Ident.: PRO-ABN-FUEL-10-00025095.0003001 / 08 NOV 21

MANUAL MODE

ON MCDU IF NECESSARY:

FUEL PRED key....SELECT
JET GW....CLEAR

ON OVERHEAD PANEL:

T TANK MODE....CHECK AUTO
JETTISON ARM....ON
JETTISON ACTIVE....ON

Note: If FUEL T TANK XFR FAULT alert is triggered, disregard the ECAM procedure.

CAUTION	*During jettison operation, monitor the CG. If either the forward or aft takeoff and landing limit is reached, stop jettison.*

L2 *In the case of jettison with landing gear down, there is no automatic trim tank transfer. Therefore, the flight crew may use manual trim tank transfer in order to maintain aircraft CG within limits.*

L1
- **To stop jettison operation:**
  JETTISON ACTIVE....OFF
  JETTISON ARM....OFF

[QRH] FUEL LEAK

Ident.: PRO-ABN-FUEL-00011327.0002001 / 28 MAY 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

A fuel leak may be detected by:
- The sum of FOB and FU is significantly less than FOB at engine start, or is decreasing, or
- A passenger observes a fuel spray from an engine/pylon, or a wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity of a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel Flow is excessive, N1 is low (leak from engine), or
- Fuel is smelt in the cabin.

If visibility permits, leak source may be identified by a visual check from the cabin.

WHEN A LEAK IS CONFIRMED

LAND ASAP

■ **Leak from engine/pylon confirmed by excessive fuel flow, low N1 or visual check:**

THR LEVER (affected engine)........................IDLE
ENG MASTER (affected engine)........................OFF
WING X FEED........................AS RQRD

DO NOT RESTART AFFECTED ENGINE

■ **Leak from engine/pylon not confirmed or leak not located:**

Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing, or from the Center tank, the Trim tank, or the APU/Trim feeding line.

WING X FEED........................MAINTAIN CLOSED

The crossfeed valve must remain closed to prevent the leak from affecting both sides.

L CTR PUMP........................OFF
R CTR PUMP........................OFF
T TANK FEED........................ISOL
INNER TANKS FUEL QUANTITIES........................MONITOR

Monitor the depletion rate of each inner tank.

Continued on the following page

[QRH] FUEL LEAK (Cont'd)

- **If one inner tank depletes faster than other by at least 500 kg (1 100 lb) in less than 30 min:**

  An engine leak may still be suspected. Therefore:

  THR LEVER (engine on leaking side)........................ IDLE
  ENG MASTER (engine on leaking side)........................ OFF
  FUEL LEAK........................ MONITOR

  - **If leak stops:**

    ENGINE LEAK CONFIRMED

    L CTR PUMP........................ ON
    R CTR PUMP........................ ON
    T TANK FEED........................ AUTO
    WING X FEED........................ AS RQRD

    DO NOT RESTART AFFECTED ENGINE

  - **If leak continues (after engine shutdown):**

    WING LEAK SUSPECTED

    ENGINE RESTART........................ CONSIDER
    FUEL LOSS REDUCTION........................ CONSIDER

    Refer to PRO-ABN-FUEL [QRH] FUEL LOSS REDUCTION.

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.

- **If both inner tanks deplete at a similar rate:**

  LEAK FROM CENTER TANK, TRIM TANK OR APU/TRIM FEEDING LINE SUSPECTED

  L CTR PUMP........................ ON
  R CTR PUMP........................ ON

  - **If fuel smell in cabin:**

    APU........................ OFF
    T TANK FEED........................ MAINTAIN ISOL

    This prevents additional fuel loss through the APU/Trim feeding line.

  - **If no fuel smell in cabin:**

    LEAK FROM CENTER TANK OR TRIM TANK SUSPECTED

Continued on the following page

[QRH] FUEL LEAK (Cont'd)

FUEL LOSS REDUCTION...CONSIDER

Refer to PRO-ABN-FUEL [QRH] FUEL LOSS REDUCTION.

- **For landing:** DO NOT USE REVERSERS

[QRH] FUEL LEAK

Ident.: PRO-ABN-FUEL-00011327.0016001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU

A fuel leak may be detected by:
- The sum of FOB and FU is significantly less than FOB at engine start, or is decreasing, or
- A passenger observes a fuel spray from an engine/pylon, or a wing tip, or
- The total fuel quantity is decreasing at an abnormal rate, or
- A fuel imbalance is developing, or
- Fuel quantity of a tank is decreasing too fast (leak from engine/pylon, or hole in a tank), or
- A tank is overflowing (due to pipe rupture in a tank), or
- The Fuel Flow is excessive, N1 is low (leak from engine), or
- Fuel is smelt in the cabin, or
- The destination EFOB turns to amber on the F-PLN (or on the FUEL PRED page), or
- "DEST EFOB BELOW MIN" appears on the MCDU scratchpad.

If visibility permits, leak source may be identified by a visual check from the cabin.

WHEN A LEAK IS CONFIRMED

LAND ASAP

- **Leak from engine/pylon confirmed by excessive fuel flow, low N1 or visual check:**

  THR LEVER (affected engine)....................IDLE
  ENG MASTER (affected engine)....................OFF
  WING X FEED.................... AS RQRD

  DO NOT RESTART AFFECTED ENGINE

- **Leak from engine/pylon not confirmed or leak not located:**

  Stop any fuel transfer, and then monitor the depletion rate of each inner tank, to determine if the leak is from an engine or a wing, or from the Center tank, the Trim tank, or the APU/Trim feeding line.

  WING X FEED....................MAINTAIN CLOSED

  The crossfeed valve must remain closed to prevent the leak from affecting both sides.

  L CTR PUMP....................OFF
  R CTR PUMP.................... OFF
  T TANK FEED.................... ISOL
  INNER TANKS FUEL QUANTITIES....................MONITOR

  Monitor the depletion rate of each inner tank.

Continued on the following page

[QRH] FUEL LEAK (Cont'd)

- **If one inner tank depletes faster than other by at least 500 kg (1 100 lb) in less than 30 min:**

  An engine leak may still be suspected. Therefore:

  THR LEVER (engine on leaking side)... IDLE
  ENG MASTER (engine on leaking side)..OFF
  FUEL LEAK.. MONITOR

  - **If leak stops:**

    ENGINE LEAK CONFIRMED

    L CTR PUMP...ON
    R CTR PUMP...ON
    T TANK FEED.. AUTO
    WING X FEED.. AS RQRD

    DO NOT RESTART AFFECTED ENGINE

  - **If leak continues (after engine shutdown):**

    WING LEAK SUSPECTED

    ENGINE RESTART...CONSIDER
    FUEL LOSS REDUCTION...CONSIDER

    Refer to PRO-ABN-FUEL [QRH] FUEL LOSS REDUCTION.

CAUTION	Do not apply the FUEL IMBALANCE procedure. Approach and landing can be done, even with one full wing/one empty wing.

- **If both inner tanks deplete at a similar rate:**

  LEAK FROM CENTER TANK, TRIM TANK OR APU/TRIM FEEDING LINE SUSPECTED

  L CTR PUMP.. ON
  R CTR PUMP...ON

  - **If fuel smell in cabin:**
    APU...OFF
    T TANK FEED...MAINTAIN ISOL
    This prevents additional fuel loss through the APU/Trim feeding line.

  - **If no fuel smell in cabin:**

    LEAK FROM CENTER TANK OR TRIM TANK SUSPECTED

Continued on the following page

[QRH] FUEL LEAK (Cont'd)

FUEL LOSS REDUCTION....................CONSIDER

Refer to PRO-ABN-FUEL [QRH] FUEL LOSS REDUCTION.

- **For landing:** DO NOT USE REVERSERS

[QRH] FUEL LOSS REDUCTION

Ident.: PRO-ABN-FUEL-00019480.0002001 / 17 MAR 17
Applicable to: ALL

Apply this procedure only if suggested by the FUEL LEAK procedure, and if the flight crew needs to minimize the fuel loss. It covers two types of leak:

- A leak from wing: a manual Trim tank transfer (via the Center tank) and/or manual Center tank transfer can be done, to symmetrically transfer fuel to both inner tanks, and avoid automatic transfer to only the least full inner tank, or
- A leak from the Center tank, or the Trim tank: a manual Trim and/or Center tank transfer to both inner tanks can be done to save some Trim or Center tank fuel.

- **If Center Tank or Trim Tank not empty:**

  L CTR PUMP....................ON
  R CTR PUMP....................ON
  CTR TK XFR....................MAN
  T TANK FEED (if not empty)....................AUTO
  T TANK MODE (if not empty)....................FWD

  - **When Trim Tank empty:**

    T TANK MODE....................AUTO
    T TANK FEED....................ISOL

  - **When Center Tank empty:**

    CTR TK XFR....................AUTO

[QRH] FUEL OVERREAD

Ident.: PRO-ABN-FUEL-00024381.0001001 / 30 JUN 20
Applicable to: ALL

FOB / F. USED....................CHECK

- **If discrepancy confirmed:**
  FUEL QTY UNRELIABLE

  L2 *FOB must be considered unreliable even if the indication is not displayed with two dashes across the two last digits on the FUEL SD page.*

  L1 DISREGARD FMS FUEL PREDICTIONS
  COMPUTE FOB FROM INITIAL FOB - F.USED

FUEL LO LVL ALERTS REMAIN RELIABLE

L2 *Fuel low level alerts remain reliable as they are computed using independent sensors.*

L1 Maintenance action is due before next flight.

[QRH] GRAVITY FUEL FEEDING

Ident.: PRO-ABN-FUEL-00011241.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ENG START selector....................IGN
AVOID NEGATIVE G FACTOR
MAX ALTITUDE: GRAVITY FEED CEILING

- *20 000 ft if flight time from takeoff > 30 min*
- *15 000 ft if flight time from takeoff < 30 min*
- *10 000 ft for JP4 or JET B if flight time from takeoff < 30 min*

- **When reaching gravity feed ceiling:**
  WING X FEED....................CLOSE

  Crossfeed valve closes, except in EMER ELEC configuration.

INR UNUSABLE IF < 2 000 kg (4 400 lb)

2 000 kg (4 400 lb) of fuel per affected tank cannot be used by gravity.

[QRH] GRAVITY FUEL FEEDING

Ident.: PRO-ABN-FUEL-00011241.0006001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

ENG START selector.......................................IGN
AVOID NEGATIVE G FACTOR
MAX ALTITUDE: GRAVITY FEED CEILING

- *20 000 ft if flight time from takeoff > 30 min*
- *15 000 ft if flight time from takeoff < 30 min*
- *7 000 ft for JP4 or JET B if flight time from takeoff < 30 min*

● **When reaching gravity feed ceiling:**

WING X FEED.......................................CLOSE

Crossfeed valve closes, except in EMER ELEC configuration.

INR UNUSABLE IF < 2 000 kg (4 400 lb)

2 000 kg (4 400 lb) of fuel per affected tank cannot be used by gravity.

[QRH] TRIM TANK FUEL UNUSABLE

Ident.: PRO-ABN-FUEL-00011326.0004001 / 17 MAR 17
Applicable to: ALL

T TANK MODE..........FWD
T TANK FEED..........OPEN

- **If TRIM TANK FUEL unusable:**

  OUTR TK XFR.......... ON

  The CG moves forward

  L CTR TK PUMP..........OFF
  R CTR TK PUMP.......... OFF

  If the center tank is not yet empty, maintain fuel in the aircraft's center tank by switching off the pumps. This will reduce the effect of unusable trim tank fuel on the aircraft's center of gravity.

  MAXIMUM FLIGHT TIME: 4 HOURS

  After 4 h, depending on the fuel distribution, the aft CG limit may be reached.

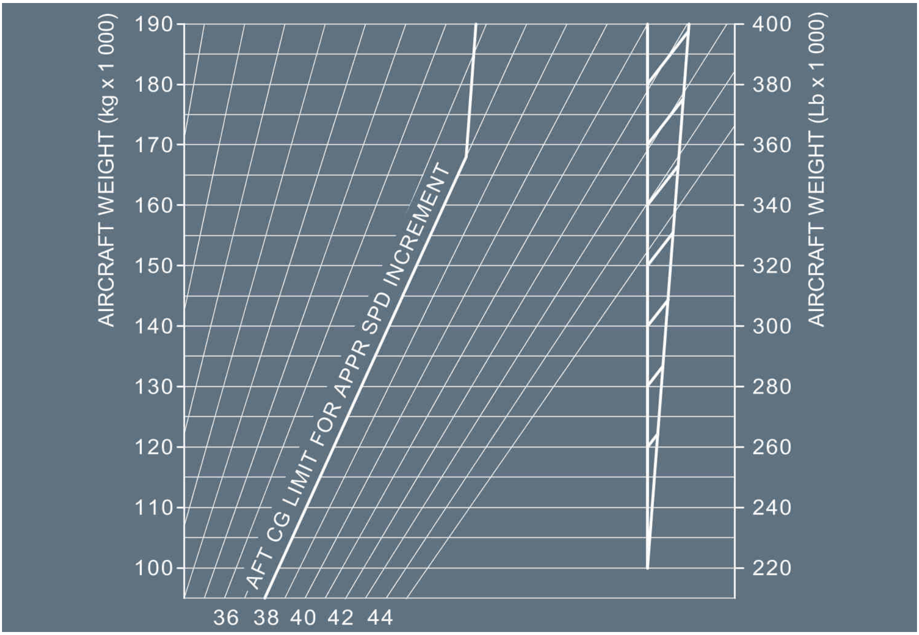
- **If CG > aft CG limit shown below, at landing:**

  APPR SPD: VLS +10 kt
  LDG DIST PROC.......... APPLY

  FOR ROLLOUT: APPLY CONTINUOUS MANUAL BRAKING

Continued on the following page

[QRH] TRIM TANK FUEL UNUSABLE (Cont'd)



FUEL AFT XFR FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

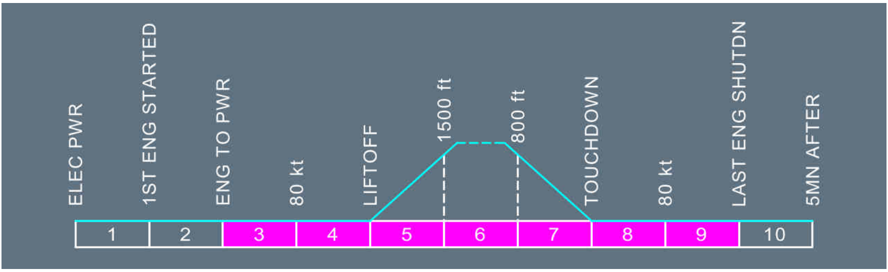
Ident.: PRO-ABN-FUEL-BE1-00021010.0001001 / 28 FEB 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the AFT XFR is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BE1-00025777.0001001 / 05 MAY 22

Crew awareness.

Ident.: PRO-ABN-FUEL-BE1-00021011.0001001 / 28 FEB 17

STATUS

INOP SYS

FUEL AFT XFR

FUEL ABNORM MAN FWD XFR

Applicable to: ALL

Ident.: PRO-ABN-FUEL-AO-00017774.0001001 / 21 MAR 16

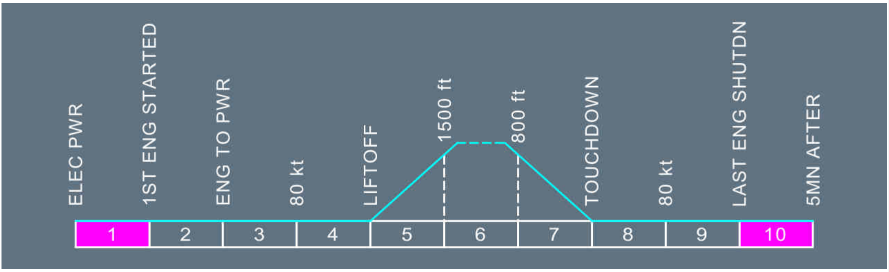
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the T TANK MODE pb is selected FWD, or when the TRIM TANK FEED selector is set to OPEN, if:

- The trim tank pump is failed or not installed, and
- The aircraft pitch attitude is above 3.4 ° for longer than 30 s.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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L1 *Note:* *This alert does not trigger in case of inner tank low level, or in case of AFT CG warning.*

Ident.: PRO-ABN-FUEL-AO-00017954.0001001 / 21 MAR 16

- **FOR SPD < 270 KT OR IN CLIMB:**
  T TANK MODE........ AUTO
  T TANK FEED........ AUTO
- **WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE........ FWD
  T TANK FEED........ OPEN

FUEL APU AFT PUMP FAULT

Applicable to: ALL

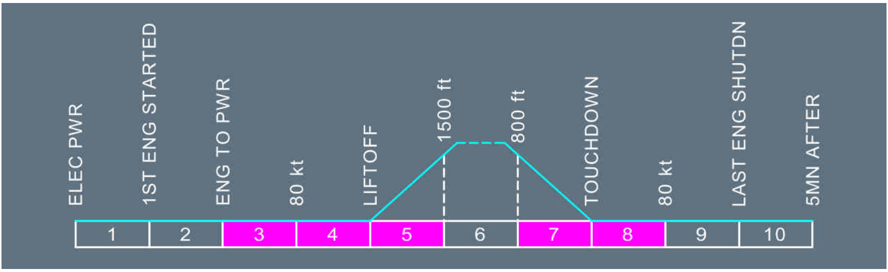
Ident.: PRO-ABN-FUEL-AN-00017779.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the APU AFT pump is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-AN-00019446.0001001 / 21 MAR 16

- **IF APU RQRD:**

  MAX FL.. 250

L2 *These lines are displayed on the ECAM, if the trim tank is not empty.*

Ident.: PRO-ABN-FUEL-AN-00019447.0001001 / 21 MAR 16

STATUS

- **IF T TANK NOT EMPTY:**

  APU AVAIL BELOW FL 250

FUEL APU LP VALVE FAULT

Applicable to: ALL

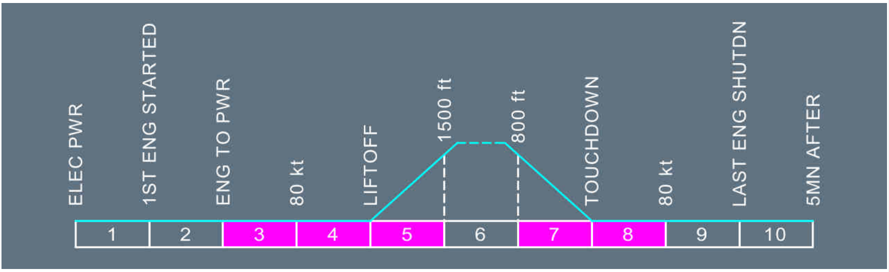
Ident.: PRO-ABN-FUEL-BF-00017781.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the valve position disagrees with the selected position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BF-00018001.0001001 / 21 MAR 16

Crew awareness.

FUEL CELL NOT FULL

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BA-00017790.0002001 / 24 AUG 17

ANNUNCIATIONS

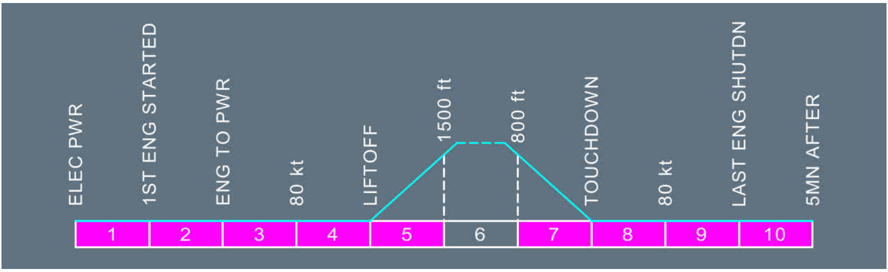
Triggering Conditions:

L2

This alert triggers when:

- The fuel quantity in one or in all collector cell(s) is less than 500 kg (1 102 lb), and
- One or more fuel pumps on the corresponding side is (are) running.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BA-00019573.0001001 / 21 MAR 16

JETTISON (IF INSTALLED AND IF IN OPERATION)...OFF

- **IF NO FUEL LEAK**

  WING X FEED..ON

- **If one collector is depleting, and the Xfeed valve is not fully open, or if both collector cells are depleting:**

  AVOID NEGATIVE G FACTOR

Continued on the following page

FUEL CELL NOT FULL (Cont'd)

Ident.: PRO-ABN-FUEL-BA-00013341.0004001 / 18 MAR 11

STATUS

- **If one collector cell is depleting and the Xfeed valve is not fully open, or if both collector cells are depleting:**
  AVOID NEGATIVE G FACTOR

FUEL CTR TK XFR FAULT

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BK-00017805.0006001 / 21 MAR 16

ANNUNCIATIONS

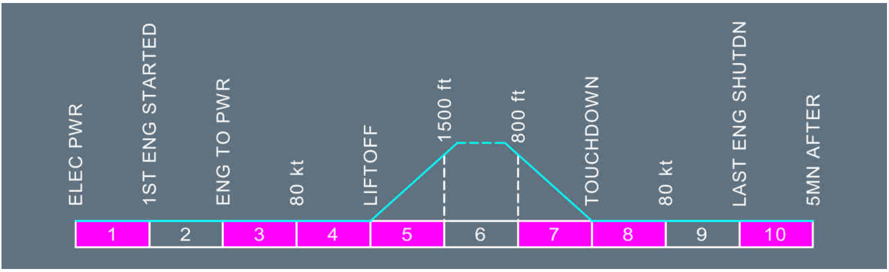
Triggering Conditions:

L2

This alert triggers when:

- The center tank is empty, and
- One of the center tank fuel pumps is still running.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL CTR TK XFR FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-BK-00019105.0001001 / 21 MAR 17

L CTR PUMP..OFF
R CTR PUMP..OFF

- ■ **IF TRIM TANK IS EMPTY:**
  T TANK FEED..ISOL
  T TANK MODE..AUTO
- ■ **IF TRIM TANK IS NOT EMPTY:**
  T TANK MODE..FWD
  - ● **WHEN TRIM TANK IS EMPTY:**
    T TANK FEED..ISOL
    T TANK MODE..AUTO
    L CTR PUMP..ON
    R CTR PUMP..ON

L2 *Note: The alert will be recalled when the center tank is empty.*

FUEL CTR TO INNER FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Ident.: PRO-ABN-FUEL-V-00017808.0001001 / 21 MAR 16

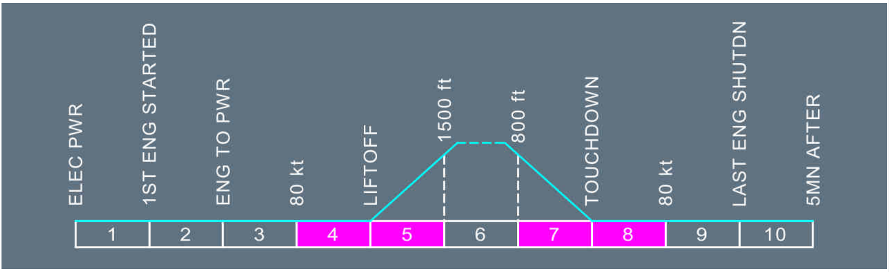
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- An anomaly is detected during the center to inner transfer, or
- The left (right) outer inlet valve is failed in open position, or
- The left (right) inner inlet valve is failed in open position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-V-00018027.0001001 / 21 MAR 16

L + R CTR PUMPS....................OFF

- **WHEN EITHER INR < 17 T:**

  OUTR TK XFR (IF OUTR INLET VALVE OPEN)....................ON
  CTR TANK XFR (IF LOW LEVEL SENSOR FAILED).................... MAN
  L + R CTR PUMPS....................ON

  - **For A330 only:**

    - **WHEN CTR TK EMPTY:**

      CTR TANK XFR....................AUTO

Continued on the following page

FUEL CTR TO INNER FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-V-00011280.0004001 / 28 FEB 17

STATUS

	INOP SYS
CTR TO INR: MAN ONLY	FUEL AFT XFR

FUEL CTR TO INNER FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Ident.: PRO-ABN-FUEL-V-00017808.0001001 / 21 MAR 16

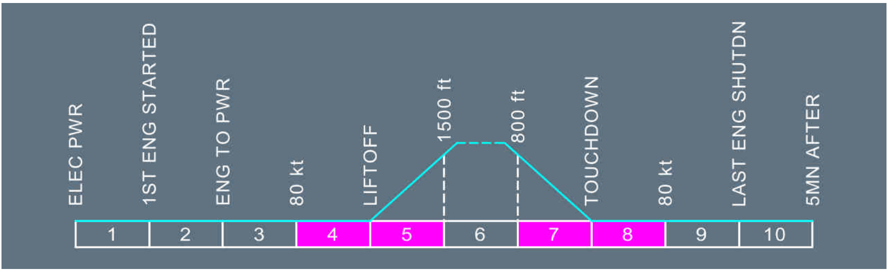
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- An anomaly is detected during the center to inner transfer, or
- The left (right) outer inlet valve is failed in open position, or
- The left (right) inner inlet valve is failed in open position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL CTR TO INNER FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-V-00018027.0001001 / 21 MAR 16

L + R CTR PUMPS....................OFF

- **WHEN EITHER INR < 17 T:**
  OUTR TK XFR (IF OUTR INLET VALVE OPEN)....................ON
  CTR TANK XFR (IF LOW LEVEL SENSOR FAILED).................... MAN
  L + R CTR PUMPS....................ON
  - **For A330 only:**
    - **WHEN CTR TK EMPTY:**
      CTR TANK XFR....................AUTO

Ident.: PRO-ABN-FUEL-V-00011280.0001001 / 13 AUG 10

STATUS

CTR TO INR: MAN ONLY

FUEL ENG 1(2) FEEDLINE BURST

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

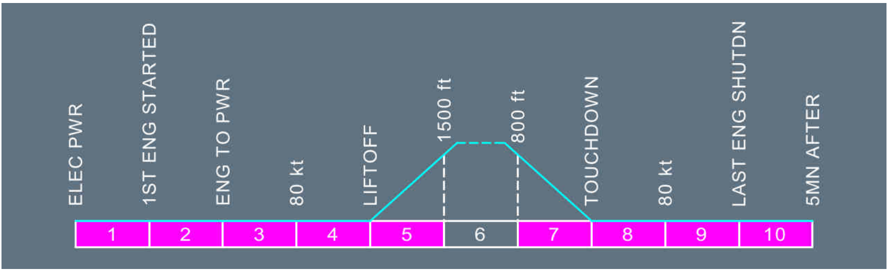
Ident.: PRO-ABN-FUEL-I-00017812.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when an engine feedline burst is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL ENG 1(2) FEEDLINE BURST (Cont'd)

Ident.: PRO-ABN-FUEL-I-00018033.0004001 / 21 MAR 17

LAND ASAP

ENG 1(2) FAIL

WING X FEED.....DO NOT OPEN

- **If flight time from takeoff more than 30 min:**
  GRVTY FEED CEILING : FL200
- **If flight time from takeoff less than 30 min:**
  GRVTY FEED CEILING : FL150
  - **For aircraft equipped with GE engines:**
    IF JP4/JET B FUEL : FL100
  - **For aircraft equipped with RR engines:**
    IF JP4/JET B FUEL : FL70

ENG START SEL.....IGN
THR LEVER (AFFECTED ENGINE).....IDLE
PUMPS (AFFECTED).....OFF
STBY PUMP (AFFECTED SIDE).....OFF

- **IF NO RELIGHT AFTER 30 s:**
  ENG MASTER (AFFECTED ENGINE).....OFF
- **AT GRVTY FEED CEILING:**
  ENG (AFFECTED) RELIGHT.....CONSIDER

L2 *Apply the ENG RELIGHT (in flight) procedure Refer to PRO-ABN-ENG [QRH] ENG RELIGHT IN FLIGHT.*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG SHUTDOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN) if engine relight is not successful.

Continued on the following page

FUEL ENG 1(2) FEEDLINE BURST (Cont'd)

Ident.: PRO-ABN-FUEL-I-00011235.0031001 / 24 MAR 11

STATUS

DO NOT OPEN WING X FEED

- ● **FOR GRVTY FEED:**
  - ■ **If flight time from takeoff more than 30 min:**
    MAX FL.. 200/MEA
  - ■ **If flight time from takeoff less than 30 min:**
    MAX FL.. 150/MEA
    - ● **IF JP4/JET B FUEL:**
      MAX FL..100/MEA
- ● **AT GRVTY FEED CEILING:**
  ENG 1(2) RELIGHT.......................................CONSIDER

L(R) FUEL GRVTY FEED ONLY
L(R) INR TK PARTLY UNUSABLE

INOP SYS

FUEL AFT XFR (1)
L(R) FUEL PUMPS

(1) *(only if center tank empty)*

FUEL ENG 1(2) FEEDLINE BURST

Applicable to: LV-KHT, LV-KHU

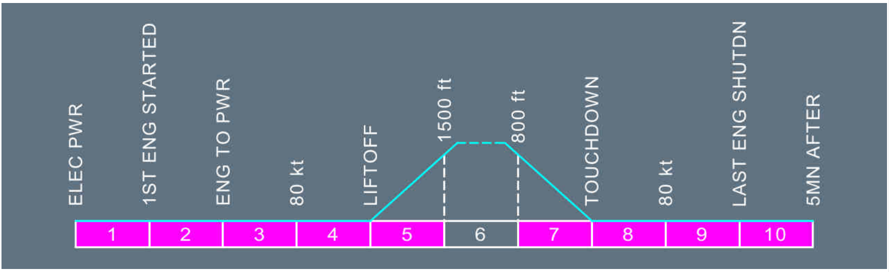
Ident.: PRO-ABN-FUEL-I-00017812.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when an engine feedline burst is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL ENG 1(2) FEEDLINE BURST (Cont'd)

Ident.: PRO-ABN-FUEL-I-00018033.0004001 / 21 MAR 17

LAND ASAP

ENG 1(2) FAIL

WING X FEED....................DO NOT OPEN

- **If flight time from takeoff more than 30 min:**
  GRVTY FEED CEILING : FL200
- **If flight time from takeoff less than 30 min:**
  GRVTY FEED CEILING : FL150
  - **For aircraft equipped with GE engines:**
    IF JP4/JET B FUEL : FL100
  - **For aircraft equipped with RR engines:**
    IF JP4/JET B FUEL : FL70

ENG START SEL....................IGN

THR LEVER (AFFECTED ENGINE)....................IDLE

PUMPS (AFFECTED)....................OFF

STBY PUMP (AFFECTED SIDE)....................OFF

- **IF NO RELIGHT AFTER 30 s:**
  ENG MASTER (AFFECTED ENGINE)....................OFF
- **AT GRVTY FEED CEILING:**
  ENG (AFFECTED) RELIGHT....................CONSIDER

L2 *Apply the ENG RELIGHT (in flight) procedure Refer to PRO-ABN-ENG [QRH] ENG RELIGHT IN FLIGHT.*

L12

ASSOCIATED PROCEDURES

ENG 1(2) SHUT DOWN

Apply the ENG SHUTDOWN procedure (Refer to PRO-ABN-ENG ENG 1(2) SHUT DOWN) if engine relight is not successful.

Continued on the following page

FUEL ENG 1(2) FEEDLINE BURST (Cont'd)

Ident.: PRO-ABN-FUEL-I-00011235.0028001 / 24 MAR 11

STATUS

DO NOT OPEN WING X FEED

- **FOR GRVTY FEED:**
  - **If flight time from takeoff more than 30 min:**
    MAX FL.. 200/MEA
  - **If flight time from takeoff less than 30 min:**
    MAX FL.. 150/MEA
    - **IF JP4/JET B FUEL:**
      MAX FL..70/MEA
- **AT GRVTY FEED CEILING:**
  ENG 1(2) RELIGHT.......................................CONSIDER

L(R) FUEL GRVTY FEED ONLY
L(R) INR TK PARTLY UNUSABLE

INOP SYS

FUEL AFT XFR (1)
L(R) FUEL PUMPS

(1) *(only if center tank empty)*

FUEL ENG 1(2) LP VALVE FAULT

Applicable to: ALL

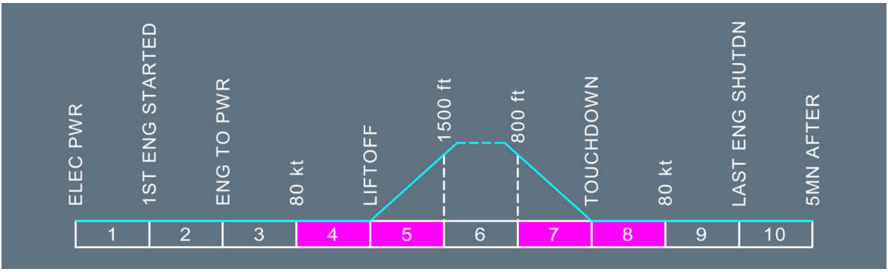
Ident.: PRO-ABN-FUEL-BL-00017813.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the valve position disagrees with the selected position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BL-00019109.0001001 / 21 MAR 16

Crew awareness.

FUEL EXCESS AFT CG

Applicable to: ALL

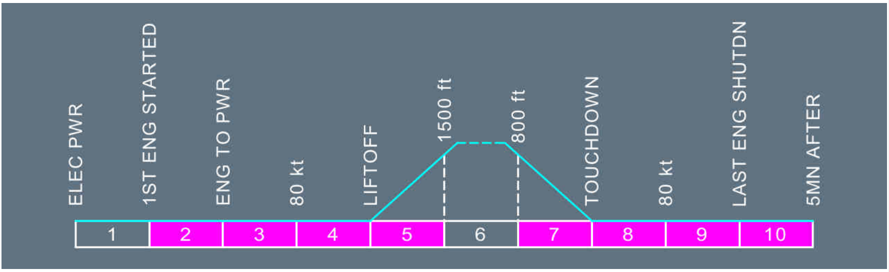
Ident.: PRO-ABN-FUEL-X-00017816.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fuel center of gravity exceeds the aft limit.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-X-00019501.0001001 / 21 MAR 16

PITCH ATT..BELOW 3 DEG

L2 *This line is only displayed if the trim tank pump is failed. Decrease pitch attitude below 3 ° before initiating the forward transfer.*

L1 T TANK MODE...FWD

L2 *Fuel consumption increases by approximately 1 %.*

Ident.: PRO-ABN-FUEL-X-00019502.0001001 / 21 MAR 16

L12

STATUS

LVL OFF FOR MAN FWD XFR

Displayed if the trim tank pump is failed.

FUEL FCMC 1(2) FAULT

Applicable to: ALL

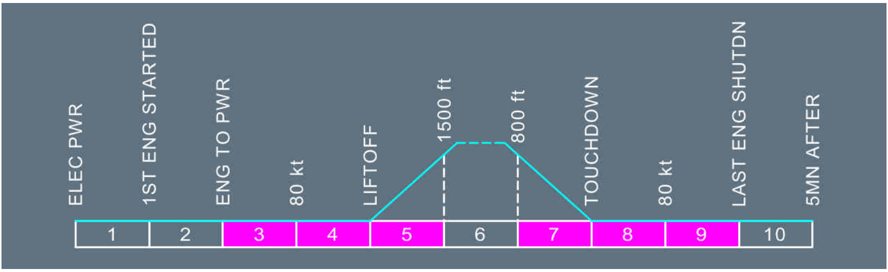
Ident.: PRO-ABN-FUEL-AH-00017817.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one FCMC is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-AH-00011305.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-FUEL-AH-00011306.0001001 / 13 AUG 10

STATUS

INOP SYS

FCMC 1(2)

FUEL FCMC 1+2 FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

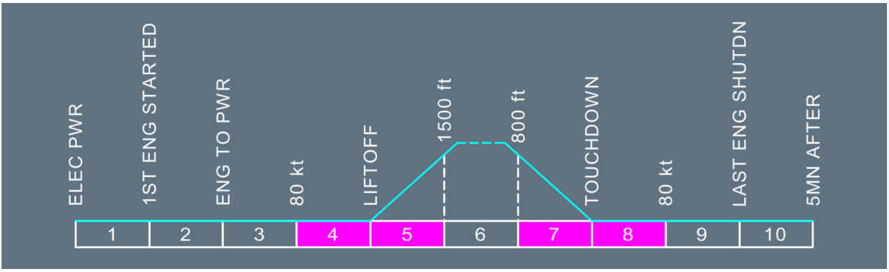
Ident.: PRO-ABN-FUEL-AJ-00017818.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both FCMCs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL FCMC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-AJ-00018069.0005001 / 21 MAR 16

L2 Transfers are controlled using the T TANK MODE pb-sw, and the OUTR XFR pb-sw.

L1 FCMC 1+2.. RESET
WEIGHT/CG..INTIALIZE

L2 *In flight, if the dual FCMC reset is successful, the FCMC 1+2 ECAM caution will be replaced by the NO WEIGHT/CG DATA ECAM caution. Refer to PRO-ABN-FUEL FUEL NO WEIGHT/CG DATA.*

L1 FUEL TK XFR: MAN ONLY

- **IF CG AFT 32 %:**

L2 Read the CG on the MCDU FUEL PRED page.

L1 T TANK MODE... FWD

L2 *Fuel consumption increases by approximately 1 %.*

Note: *If the trim tank pump is failed, this part of the procedure is replaced by:*

- ***IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:***

  T TANK MODE..FWD

L1
- **WHEN FOB BELOW 60 T:**

  CTR TANK XFR...MAN
  OUTR TK XFR... ON

- **WHEN FL < 250 IN DESCENT:**

  T TANK MODE.. FWD

L2 *Note:* *If the trim tank pump is failed, this part of the procedure is replaced by:*

- ***WHEN FL < 250 IN DESCENT AND SPD > 270 KT:***

  T TANK MODE..FWD

Continued on the following page

FUEL FCMC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-AJ-00011311.0003001 / 12 JUL 18

STATUS

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY
- **WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE..FWD

FUEL TK XFR: MAN ONLY

INOP SYS

FCMC 1+2
GA SOFT ◁

FUEL FCMC 1+2 FAULT

Applicable to: LV-KAN, LV-KAO

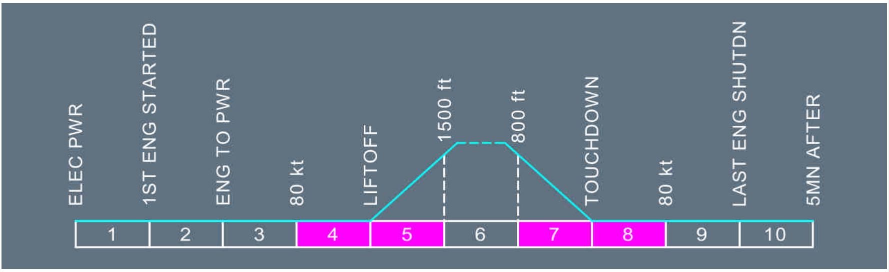
Ident.: PRO-ABN-FUEL-AJ-00017818.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both FCMCs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL FCMC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-AJ-00018069.0005001 / 21 MAR 16

L2 Transfers are controlled using the T TANK MODE pb-sw, and the OUTR XFR pb-sw.

L1 FCMC 1+2.. RESET
WEIGHT/CG..INTIALIZE

L2 *In flight, if the dual FCMC reset is successful, the FCMC 1+2 ECAM caution will be replaced by the NO WEIGHT/CG DATA ECAM caution. Refer to PRO-ABN-FUEL FUEL NO WEIGHT/CG DATA.*

L1 FUEL TK XFR: MAN ONLY

- **IF CG AFT 32 %:**

L2 Read the CG on the MCDU FUEL PRED page.

L1 T TANK MODE.. FWD

L2 *Fuel consumption increases by approximately 1 %.*

Note: *If the trim tank pump is failed, this part of the procedure is replaced by:*

- ***IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:***
  T TANK MODE..FWD

L1
- **WHEN FOB BELOW 60 T:**
  CTR TANK XFR..MAN
  OUTR TK XFR.. ON

- **WHEN FL < 250 IN DESCENT:**
  T TANK MODE.. FWD

L2 *Note:* *If the trim tank pump is failed, this part of the procedure is replaced by:*

- ***WHEN FL < 250 IN DESCENT AND SPD > 270 KT:***
  T TANK MODE..FWD

Continued on the following page

FUEL FCMC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-AJ-00011311.0006001 / 12 JUL 18

STATUS

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY
- **WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE..FWD

FUEL TK XFR: MAN ONLY

INOP SYS

FCMC 1+2
JETTISON
GA SOFT ◁

FUEL F.USED/FOB DISAGREE

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

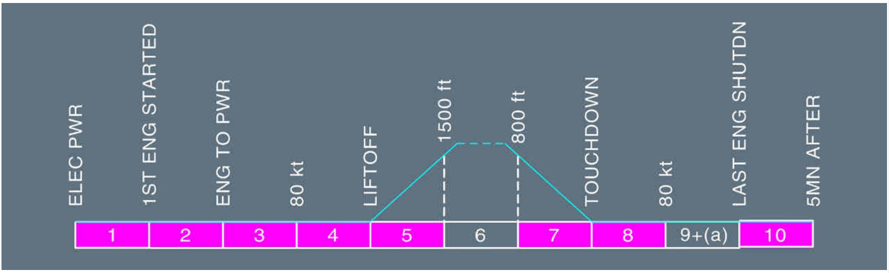
Ident.: PRO-ABN-FUEL-BP-00018041.0006001 / 30 JUN 20

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the difference between initial FOB and current FOB plus fuel used data is more than 3 500 kg (7 716 lb).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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9+(a)
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Note: (a) Alert is recalled 60 seconds after the beginning of the flight phase 9.

Continued on the following page

FUEL F.USED/FOB DISAGREE (Cont'd)

Ident.: PRO-ABN-FUEL-BP-00019116.0002001 / 30 JUN 20

- **If fuel leak detected:**
  FUEL LEAK PROC...APPLY
- **On ground, if a FQI overread is detected:**
  OVERREAD PROC..APPLY

FUEL F.USED/FOB DISAGREE

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

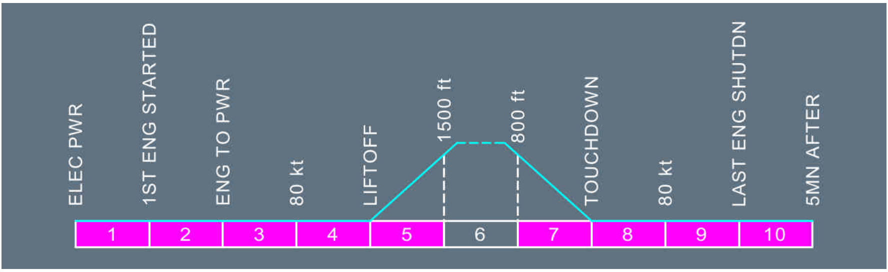
Ident.: PRO-ABN-FUEL-BP-00018041.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the difference between initial FOB and current FOB plus fuel used data is more than 3 500 kg (7 716 lb).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BP-00019116.0001001 / 21 MAR 16

FUEL LEAK PROC...APPLY

FUEL FUEL LO TEMP

Applicable to: ALL

Ident.: PRO-ABN-FUEL-AI-00018043.0001001 / 21 MAR 16

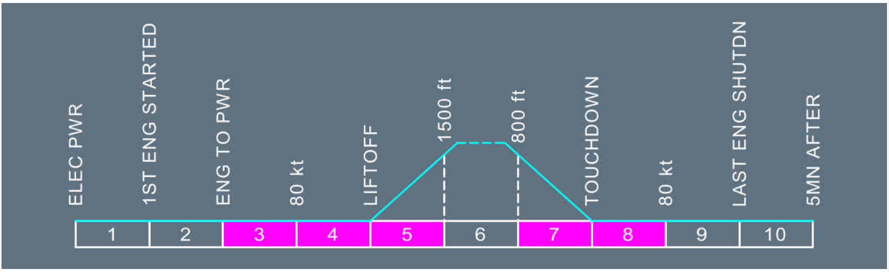
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- The inner tank fuel temperature is below -37 °C, or
- Outer tank fuel temperature is below -40 °C, or
- Trim tank fuel temperature is below -40 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL FUEL LO TEMP (Cont'd)

Ident.: PRO-ABN-FUEL-AI-00019076.0001001 / 21 MAR 17

L2 Regardless of the fuel type, the flight crew may consider delaying application of the rest of procedure, until reaching the minimum fuel temperature specific to their fuel type (*Refer to LIM-FUEL Fuel Temperature*).

L1 FUEL FREEZE PT...CHECK

- ■ **On ground, before takeoff:**
  - ● **IF JET A FUEL (not displayed at -44 °C (inner tank temp), or -47 °C (outer or trim tank temp)):**

    DELAY T.O.

    L2 *Do not takeoff until the temperature is within limits.*

- L1 ■ **In flight:**
  - ● **If inner tank temperature is less than -37 °C (auto recall at -44 °C):**
    - ● **IF JET A FUEL (not displayed at -44 °C):**

      CTR TANK XFR...MAN
  - ● **If outer tank temperature is less than -40 °C (auto recall at -47 °C):**
    - ● **IF JET A FUEL (not displayed at -47 °C):**

      OUTR TK XFR.. ON

      L2 *If the center tank is not empty, the center tank pumps must be selected OFF to avoid inadvertent fuel transfer from center to outer tanks*
  - L1 ● **If trim tank temperature is less than -40 °C (auto recall at -47 °C):**
    - ● **IF JET A FUEL (not displayed at -47 °C):**

      T TANK MODE..FWD

      L2 *Note: If trim tank pump fails, or is not installed, this part of the procedure is replaced by:*

      - ● ***WHEN SPD > 270 KT AND NOT IN CLIMB:***

        T TANK MODE...FWD

      If the CG is forward 26 % MAC, the CG should be monitored during the forward transfer, to ensure that forward CG limits are not exceeded.

      Fuel consumption increases by approximately 1 %.

Continued on the following page

FUEL FUEL LO TEMP (Cont'd)

L1

- **IF NECESSARY:**

  TAT...INCREASE

L2

Consider descending to a lower altitude and/or increasing Mach to increase TAT.

Ident.: PRO-ABN-FUEL-AI-00011309.0001001 / 22 MAR 16

L12

STATUS

- **WHEN SPD > 270 KT AND NOT IN CLIMB:**

  T TANK MODE...FWD

  Only appears, if the trim tank pump fails

FUEL INERTING SYS FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

Ident.: PRO-ABN-FUEL-AZ-00017962.0004001 / 21 MAR 16

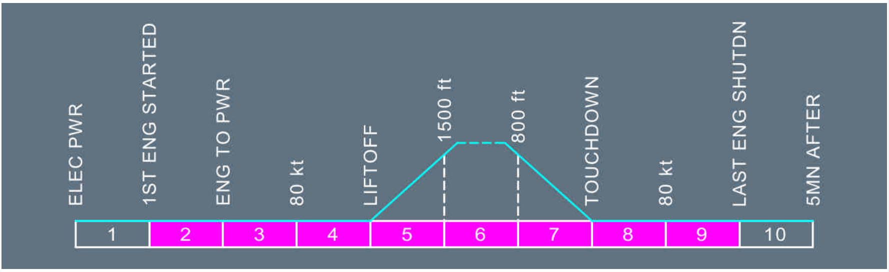
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the fuel inerting system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL INERTING SYS FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-AZ-00019472.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-FUEL-AZ-00019475.0001001 / 21 MAR 16

STATUS

INOP SYS

FUEL INERT

FUEL JETTISON FAULT

Applicable to: LV-KAN, LV-KAO

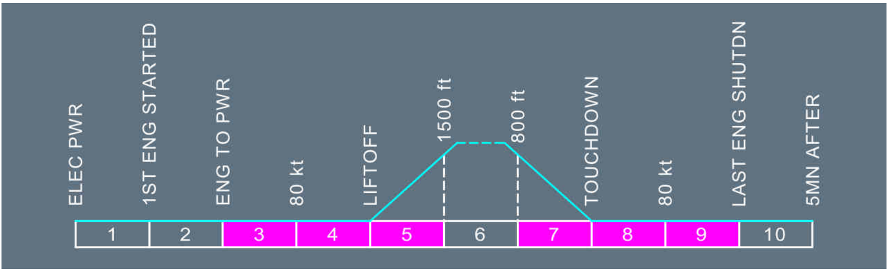
Ident.: PRO-ABN-FUEL-S-00017970.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the jettison system is inhibited (because the defuel valve is failed in open position).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-S-00019130.0001001 / 22 MAR 17

JETTISON NOT AVAIL

Continued on the following page

FUEL JETTISON FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-S-00019500.0001001 / 21 MAR 16

STATUS

INOP SYS

JETTISON

FUEL JETTISON NOT CLOSED

Applicable to: LV-KAN, LV-KAO

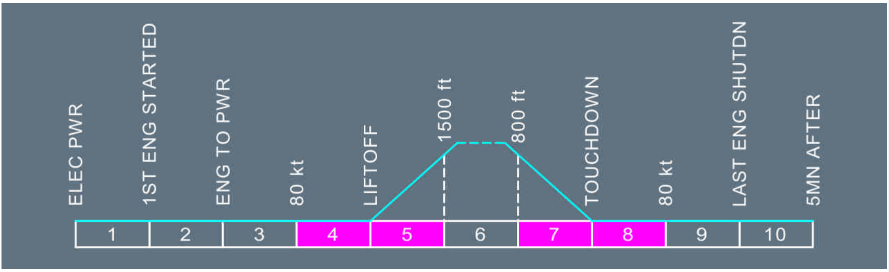
Ident.: PRO-ABN-FUEL-Q-00017971.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when either jettison valve is not closed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL JETTISON NOT CLOSED (Cont'd)

Ident.: PRO-ABN-FUEL-Q-00019499.0001001 / 21 MAR 16

JETTISON.....OFF

- **IF JETTISON CONFIRMED :**

L2 Jettison is confirmed, if the quantity still decreases at an abnormally high rate, or if fuel can be seen coming from the jettison outlet.

L1 L + R CTR PUMPS.....OFF

L2 *Selecting the center tank pumps off stops jettison.*

L1
- **WHEN EITHER INR < 17 T :**

CTR TANK XFR.....MAN

L2 *Allows some center tank fuel to be recovered.*

L1 CTR TK XFR BY GRVTY
CTR TK UNUSABLE IF < 15 T

Ident.: PRO-ABN-FUEL-Q-00019497.0001001 / 21 MAR 16

STATUS

	INOP SYS
CTR TK UNUSABLE IF < 15 T	FUEL CTR PUMPS FUEL AFT XFR

FUEL L(R) CTR PUMP LO PR

Applicable to: ALL

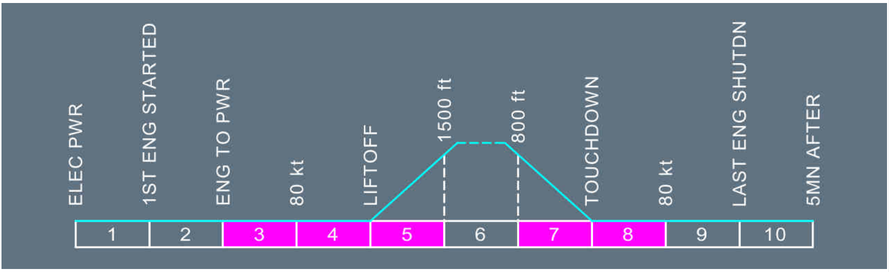
Ident.: PRO-ABN-FUEL-E-00017972.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pressure of the center pump is low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-E-00019496.0001001 / 21 MAR 16

CTR PUMP (AFFECTED)..OFF

Ident.: PRO-ABN-FUEL-E-00019495.0001001 / 21 MAR 16

STATUS

INOP SYS

L(R) CTR PUMP

FUEL L + R CTR PUMPS LO PR

Applicable to: ALL

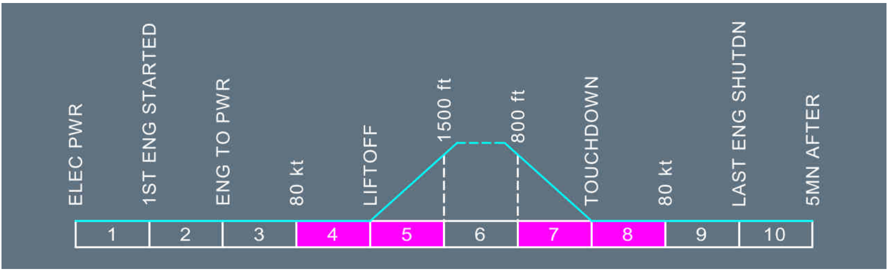
Ident.: PRO-ABN-FUEL-K-00017973.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pressure of the center pumps is low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-K-00019494.0002001 / 21 MAR 16

L + R CTR PUMPS..OFF

- **WHEN EITHER INR < 17 T:**

  CTR TANK XFR..MAN

CTR TK XFR BY GRVTY
CTR TK UNUSABLE IF < 15 T

L2 Note: *The trim tank fuel is directly transferred to the inner tanks.*

Continued on the following page

FUEL L + R CTR PUMPS LO PR (Cont'd)

Ident.: PRO-ABN-FUEL-K-00019493.0007001 / 21 MAR 16

STATUS

	INOP SYS
CTR TK UNUSABLE IF < 15 T	FUEL AFT XFR (1) F CTR PUMPS

(1) *(only if CTR TK not empty)*

FUEL L(R) INNER TK HI TEMP

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BR-00017975.0001001 / 26 NOV 19

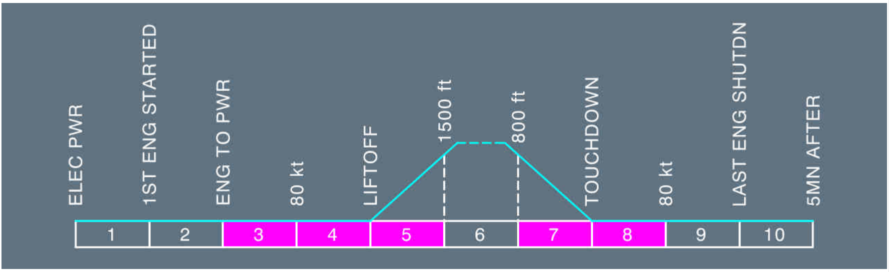
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Inner tank fuel temperature exceeds 49 °C in flight, or
- Inner tank fuel temperature exceeds 45 °C on ground.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL L(R) INNER TK HI TEMP (Cont'd)

Ident.: PRO-ABN-FUEL-BR-00019490.0001001 / 21 MAR 17

- **On ground:**

L2

This caution will automatically reappear if inner tank temperature reaches 49 °C:

However, at this threshold, crew action is required for certified JET B and JP4 FUEL only (*Refer to LIM-FUEL Fuel Temperature*), and no crew action is required for all other fuel types. To cover all other certified fuel types, this caution will automatically reappear, if the temperature reaches 55 °C.

L1

- **IF JET B FUEL:**

  DELAY T.O
  ENG MASTER (AFFECTED SIDE)... OFF
  APU...AS RQRD

- **In flight:**

Crew awareness.

FUEL L(R) STBY PUMP LO PR

Applicable to: ALL

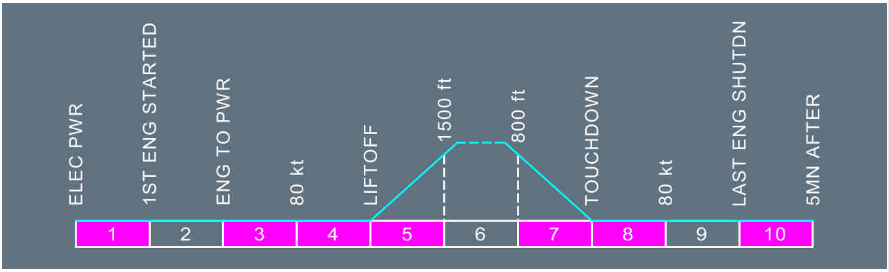
Ident.: PRO-ABN-FUEL-D-00017977.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the pressure of the standby pump is low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-D-00011214.0001001 / 13 AUG 10

STBY PUMP (AFFECTED)..OFF

Ident.: PRO-ABN-FUEL-D-00011216.0001001 / 13 AUG 10

STATUS

INOP SYS

FUEL AFT XFR
L (R) FUEL STBY

FUEL L(R) WING PUMPS LO PR
(THE FAILURE IS DUE TO AN ENGINE FEED LINE RUPTURE)

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

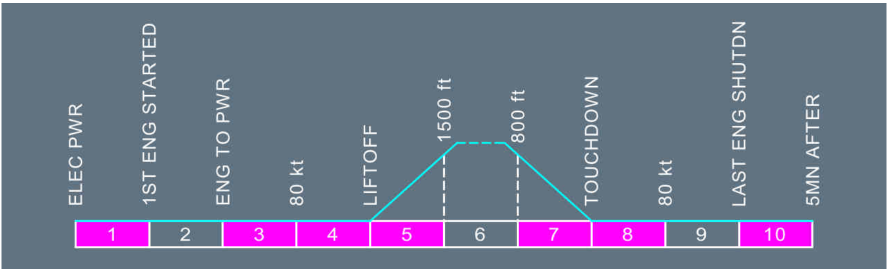
Ident.: PRO-ABN-FUEL-H-00017982.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when L(R) wing pump is operating at low pressure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL L(R) WING PUMPS LO PR (Cont'd)
(THE FAILURE IS DUE TO AN ENGINE FEED LINE RUPTURE)

Ident.: PRO-ABN-FUEL-H-00018107.0001001 / 21 MAR 16

WING X FEED..DO NOT OPEN

- ■ **If flight time from takeoff more than 30 min:**
  GRVTY FEED CEILING: FL 200
- ■ **If flight time from takeoff less than 30 min:**
  GRVTY FEED CEILING: FL 150
  - ● **For aircraft equipped with GE engines:**
    IF JP4/JET B FUEL: FL 100
  - ● **For aircraft equipped with RR engines:**
    IF JP4/JET B FUEL: FL 70

  ENG START SEL..IGN
  PUMPS (AFFECTED)..OFF
  STBY PUMP (AFFECTED SIDE)..OFF

L (R) FUEL GRVTY FEED ONLY

Ident.: PRO-ABN-FUEL-H-00011233.0033001 / 18 MAR 11

STATUS

DO NOT OPEN WING X FEED

- ● **FOR GRVTY FEED:**
  - ■ **If flight time from takeoff more than 30 min:**
    MAX FL........................ 200/MEA
  - ■ **If flight time from takeoff less than 30 min:**
    MAX FL........................ 150/MEA
    - ● **IF JP4/JET B FUEL:**
      MAX FL........................100/MEA

L(R) FUEL GRVTY FEED ONLY
L(R) INR TK PARTLY UNUSABLE

INOP SYS

FUEL AFT XFR (1)
L(R) FUEL PUMPS

---

(1) *(only if centre tank empty)*

FUEL L(R) WING PUMPS LO PR
(THE FAILURE IS DUE TO AN ENGINE FEED LINE RUPTURE)

Applicable to: LV-KHT, LV-KHU

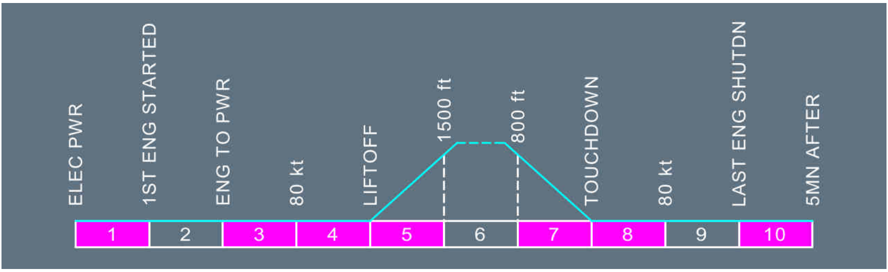
Ident.: PRO-ABN-FUEL-H-00017982.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when L(R) wing pump is operating at low pressure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL L(R) WING PUMPS LO PR (Cont'd)
(THE FAILURE IS DUE TO AN ENGINE FEED LINE RUPTURE)

Ident.: PRO-ABN-FUEL-H-00018107.0001001 / 21 MAR 16

WING X FEED....................DO NOT OPEN

- ■ **If flight time from takeoff more than 30 min:**
  GRVTY FEED CEILING: FL 200
- ■ **If flight time from takeoff less than 30 min:**
  GRVTY FEED CEILING: FL 150
  - ● **For aircraft equipped with GE engines:**
    IF JP4/JET B FUEL: FL 100
  - ● **For aircraft equipped with RR engines:**
    IF JP4/JET B FUEL: FL 70

  ENG START SEL....................IGN
  PUMPS (AFFECTED)....................OFF
  STBY PUMP (AFFECTED SIDE)....................OFF

L (R) FUEL GRVTY FEED ONLY

Ident.: PRO-ABN-FUEL-H-00011233.0032001 / 18 MAR 11

STATUS

DO NOT OPEN WING X FEED

- ● **FOR GRVTY FEED:**
  - ■ **If flight time from takeoff more than 30 min:**
    MAX FL.................... 200/MEA
  - ■ **If flight time from takeoff less than 30 min:**
    MAX FL.................... 150/MEA
    - ● **IF JP4/JET B FUEL:**
      MAX FL....................70/MEA

L(R) FUEL GRVTY FEED ONLY
L(R) INR TK PARTLY UNUSABLE

INOP SYS

FUEL AFT XFR (1)
L(R) FUEL PUMPS

(1) *(only if center tank empty)*

FUEL L(R) WING PUMPS LO PR
(THE FAILURE IS NOT DUE TO AN ENGINE FEED LINE RUPTURE)

Applicable to: ALL

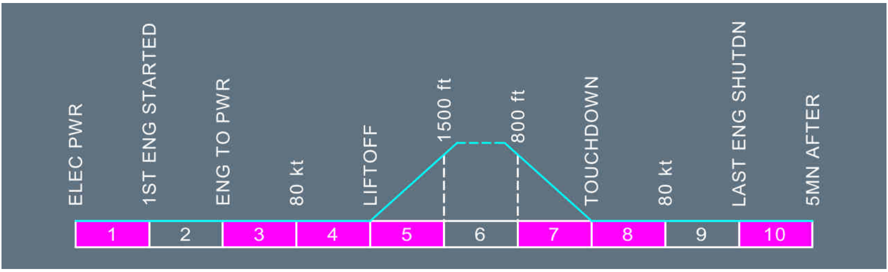
Ident.: PRO-ABN-FUEL-G-00017984.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when L(R) wing pump is operating at low pressure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-G-00011229.0004001 / 01 OCT 19

- **IF NO FUEL LEAK:**
  WING X FEED..ON

PUMPS (AFFECTED SIDE)..OFF
STBY PUMP (AFFECTED SIDE)..OFF
L (R) FUEL GRVTY FEED ONLY
GRVTY FEED PROC..APPLY

Continued on the following page

FUEL L(R) WING PUMPS LO PR (Cont'd)
(THE FAILURE IS NOT DUE TO AN ENGINE FEED LINE RUPTURE)

Ident.: PRO-ABN-FUEL-G-00011230.0009001 / 26 AUG 13

STATUS

GRVTY FEED PROC...APPLY

L (R) FUEL GRVTY FEED ONLY
L(R) INR TK : 2T UNUSABLE

INOP SYS

FUEL AFT XFR (1)
L (R) FUEL PUMPS

(1) *(only if center tank empty)*

FUEL L(R) WING TK LO LVL

Applicable to: ALL

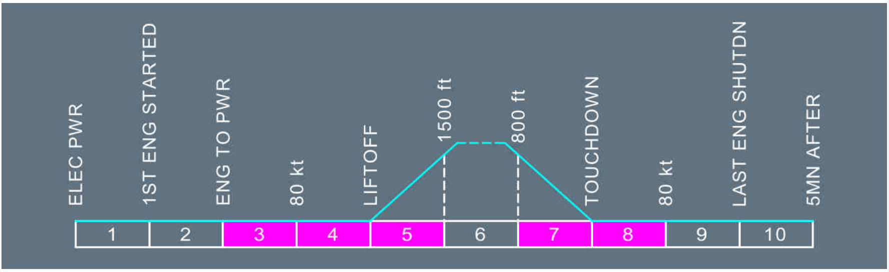
Ident.: PRO-ABN-FUEL-T-00017985.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both level sensors of one inner tank have dried-up for more than 60 s. Depending on the pitch attitude and fuel density, the alert may be triggered when fuel in one of the inner tank is between 1 100 kg (2 425 lb) and 2 520 kg (5 556 lb).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL L(R) WING TK LO LVL (Cont'd)

Ident.: PRO-ABN-FUEL-T-00018111.0006001 / 21 MAR 16

- **If the center tank is not empty:**
  CTR TANK XFR..MAN

OUTR TK XFR..ON

- **If the TRIM TK not empty:**
  T TANK MODE..FWD

L2 *Fuel consumption is increased by approximately 1 %.*

L1
- **IF NO FUEL LEAK AND IF FUEL IMBALANCE:**
  WING X FEED..ON
  L(R) STBY PUMP (SIDE WITH LO LVL)..OFF
  LEFT (RIGHT) PUMPS 1 + 2 (SIDE WITH LO LVL)..OFF

L2 *The ECAM does not request to switch OFF the STBY and both MAIN fuel pumps if both opposite MAIN fuel pumps are inoperative.*

Ident.: PRO-ABN-FUEL-T-00019487.0001001 / 21 MAR 16

L12

STATUS

LVL OFF FOR MAN FWD XFR

Displayed, if the trim tank pump is failed.

FUEL L + R WING TK LO LVL

Applicable to: ALL

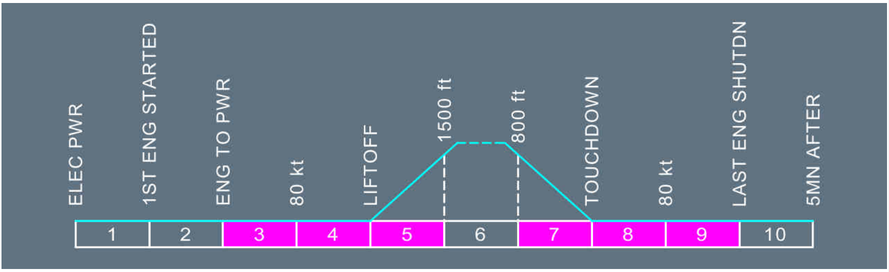
Ident.: PRO-ABN-FUEL-U-00017986.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when all of the four level sensors in the inner tanks have dried-up for more than 60 s.
Depending on the pitch attitude and fuel density, the alert may be triggered when fuel in one of the inner tank is between 1 100 kg (2 425 lb) and 2 520 kg (5 556 lb).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-U-00018115.0008001 / 21 MAR 16

LAND ASAP

- **If the center tank is not empty:**
  CTR TANK XFR....................MAN

OUTR TK XFR....................ON

- **If the TRIM TK not empty:**
  T TANK MODE....................FWD

L2 *Fuel consumption is increased by approximately 1 %.*

L1 WING PUMPS....................ON

- **IF NO FUEL LEAK:**
  WING X FEED....................ON

Continued on the following page

FUEL L + R WING TK LO LVL (Cont'd)

Ident.: PRO-ABN-FUEL-U-00019483.0001001 / 21 MAR 16

L12

STATUS

LVL OFF FOR MAN FWD XFR

Displayed, if the trim tank pump is failed.

FUEL LEFT (RIGHT) PUMP 1(2) LO PR

Applicable to: ALL

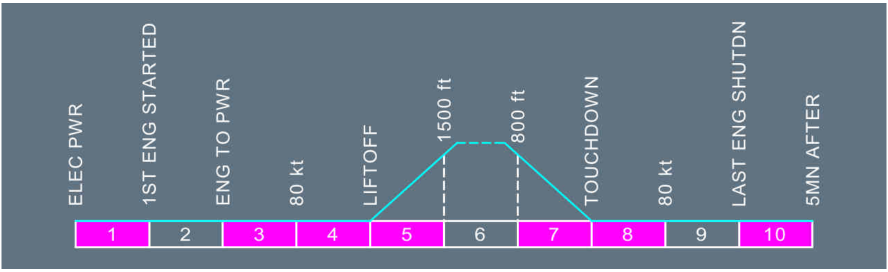
Ident.: PRO-ABN-FUEL-B-00017987.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the left (right) main pump is operating at low pressure.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-B-00011210.0001001 / 13 AUG 10

L2 The corresponding standby pump automatically replaces the faulty main pump.

L1 PUMP (AFFECTED)..OFF

Continued on the following page

FUEL LEFT (RIGHT) PUMP 1(2) LO PR (Cont'd)

Ident.: PRO-ABN-FUEL-B-00011211.0003001 / 18 MAR 11

STATUS

	INOP SYS
● **If the two main pumps of the same side are inoperative:** L(R) INR TK : 2T UNUSABLE	FUEL AFT XFR L (R) FUEL PUMP 1(2)

FUEL MAN XFR COMPLETED

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BS-00017990.0001001 / 21 MAR 16

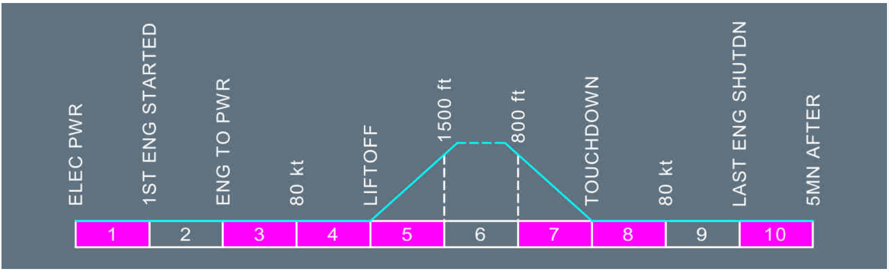
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Manual XFR selected ON, and
- Center or outer tank is empty.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BS-00018116.0006001 / 21 MAR 16

CTR TANK XFR.. AUTO
OUTR TK XFR.. AUTO

FUEL NO WEIGHT/CG DATA

Applicable to: ALL

Ident.: PRO-ABN-FUEL-BU-00018045.0001001 / 21 MAR 16

ANNUNCIATIONS

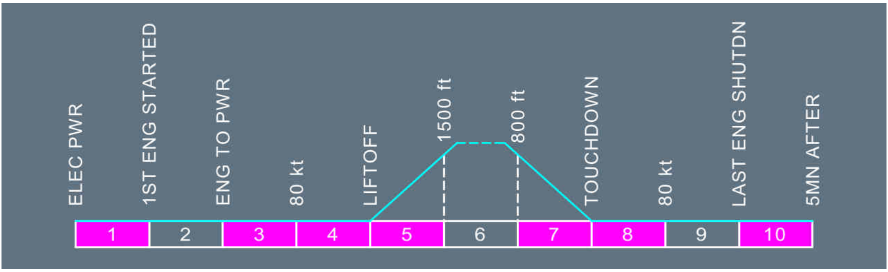
Triggering Conditions:

L2

This alert triggers:

- At engine start, if no WEIGHT/CG has been entered by the crew, or
- Following a successful reset of both FCMCs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BU-00019141.0001001 / 21 MAR 16

WEIGHT/CG...INITIALIZE

FUEL OUTR TO INR FAULT

Applicable to: ALL

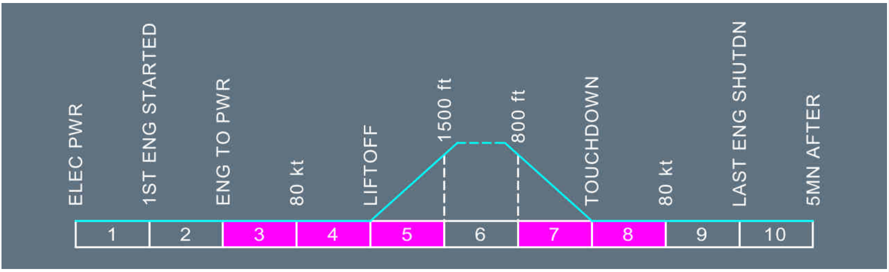
Ident.: PRO-ABN-FUEL-BV-00018047.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fuel transfer from outer to inner is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-BV-00018117.0001001 / 21 MAR 16

- **For Aircraft equipped with CTR TK ◁ only:**

  L + R CTR PUMPS .... OFF

  If center tank not empty

OUTR TK XFR .... ON

- **WHEN BOTH OUTR EMPTY:**

  OUTR TK XFR .... AUTO

  - **For Aircraft equipped with CTR TK ◁ only:**

    L + R CTR PUMPS .... ON

    If center tank not empty

L2 *Note:* *This caution is recalled when the center tanks become empty.*

FUEL T TANK XFR FAULT

Applicable to: ALL

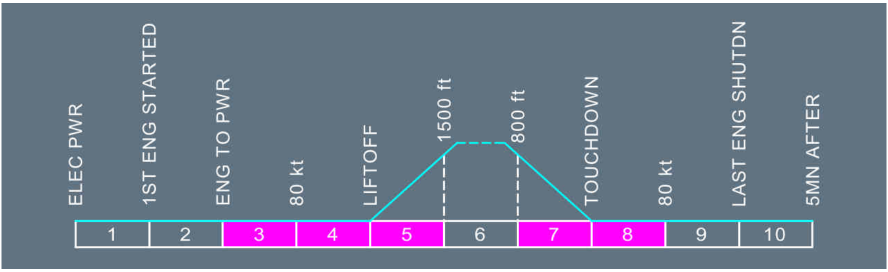
Ident.: PRO-ABN-FUEL-Y-00018053.0001001 / 26 NOV 19

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when fuel transfer to the trim tank (AFT transfer) or from the trim tank (FWD transfer) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL T TANK XFR FAULT (Cont'd)

Ident.: PRO-ABN-FUEL-Y-00019158.0003001 / 21 MAR 16

T TANK MODE.....FWD

L2 *Displayed in all other cases.*

L1 T TANK FEED.....OPEN

L2 *Fuel consumption is increased by approximately 1 %.*
Displayed if the trim tank isolation valve is failed closed or if the trim tank low level sensor is failed.

Note:
1. *If the trim tank pump is failed or not installed, the above procedure is preceded by: WHEN SPD > 270 kt AND NOT IN CLIMB:*
2. *If forward transfer is initiated by T TANK FEED sw, do not completely empty the trim tank (below around 200 kg). This avoids drainage of the trim line and so ensures APU supply.*

L1 ● **If either aft transfer valve is failed open:**

FUEL IMBALANCE.....MONITOR

● **IF TRIM TK QUANTITY NOT DECREASING:**

T TANK MODE.....AUTO
T TANK FEED.....ISOL
T TK FUEL UNUSABLE

L2 *These steps prevent unwanted aft transfer via a failed aft transfer valve.*

L1 ● **If CG is forward of 32 %:**

L2 Trim tank transfer has to be done in two steps.

L1 ● **WHEN T TANK < 2.4 T:**

T TANK MODE.....AUTO

L2 *Displayed in all other cases.*

L1 T TANK FEED.....AUTO

L2 *Displayed if the trim tank isolation valve is failed closed or if the trim tank low level sensor is failed.*
This stops the transfer after the first step.

L1 ● **WHEN CTR TANK EMPTY:**

T TANK MODE.....FWD

L2 *Displayed in all other cases.*

L1 T TANK FEED.....OPEN

Continued on the following page

FUEL T TANK XFR FAULT (Cont'd)

L2 *Displayed if the trim tank isolation valve is failed closed or if the trim tank low level sensor is failed.*
If the trim tank pump is failed or not installed, the above step is preceded by:
When CTR TANK EMPTY AND WHEN SPD > 270 kt AND NOT IN CLIMB:

L1 ● **WHEN T TANK EMPTY:**
T TANK MODE.. AUTO

L2 *Displayed in all other cases.*

L1 T TANK FEED.. AUTO

L2 *Displayed if the trim tank isolation valve is failed closed or if the trim tank low level sensor is failed.*

L1 ● **If either aft transfer valve failed open:**
T TANK FEED..ISOL

● **IF T TK FUEL UNUSABLE:**
T TK UNUSBL PROC... APPLY

Ident.: PRO-ABN-FUEL-Y-00019469.0001001 / 21 MAR 16

L12

STATUS

● **WHEN SPD > 270 KT AND NOT IN CLIMB:**
T TANK MODE..FWD
T TANK FEED..OPEN
Displayed if the trim tank pump is failed.

FUEL TRIM LINE FAULT
(TRIM LINE ISOLATION VALVE FAILED OPEN AND CENTER TANK NOT EMPTY)

Applicable to: ALL

Ident.: PRO-ABN-FUEL-AE-00018057.0002001 / 21 MAR 16

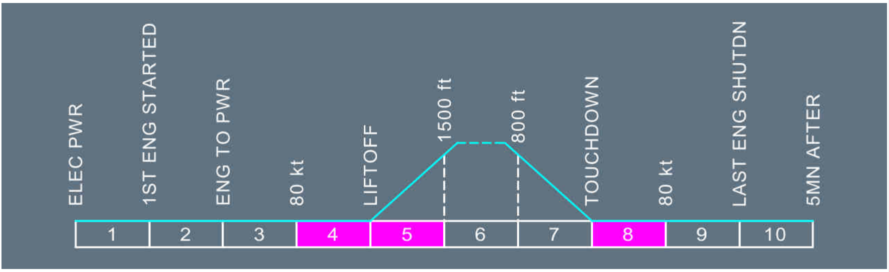
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- The trim line isolation valve is failed in open position, and
- Center tank is not empty.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL TRIM LINE FAULT (Cont'd)

(TRIM LINE ISOLATION VALVE FAILED OPEN AND CENTER TANK NOT EMPTY)

Ident.: PRO-ABN-FUEL-AE-00019167.0001001 / 21 MAR 16

JETTISON ◁ .... OFF
L + R CTR PUMPS.......... OFF
T TANK MODE.......... FWD

L2 *Note:* *If the trim tank pump is failed, this part of the procedure is replaced by:*

- ***WHEN SPD > 270 KT AND NOT IN CLIMB:***
  T TANK MODE.......... FWD

L1
- **If CG forward 32 %:**

L2 Trim tank transfer has to initiated in two steps.

L1
  - **WHEN T TANK < 2.4 T:**
    T TANK FEED.......... ISOL
    L + R CTR PUMPS.......... ON
  - **WHEN CTR TANK EMPTY:**
    L + R CTR PUMPS.......... OFF
    T TANK FEED.......... AUTO
- **WHEN T TANK EMPTY:**
  T TANK MODE.......... AUTO
  L + R CTR PUMPS.......... ON
  JETTISON ◁ .... AS RQRD

L2 *Note:* *1. The caution is recalled at each step of the procedure or when the tank becomes empty.*
2. If unsuccessful and if fuel is trapped in the trim tank Refer to PRO-ABN-FUEL [QRH] TRIM TANK FUEL UNUSABLE

Ident.: PRO-ABN-FUEL-AE-00019463.0003001 / 21 MAR 16

STATUS

INOP SYS

FUEL AFT XFR
APU (When T TK isol)

FUEL TRIM LINE FAULT
(TRIM TANK ISOLATION FAULT)

Applicable to: ALL

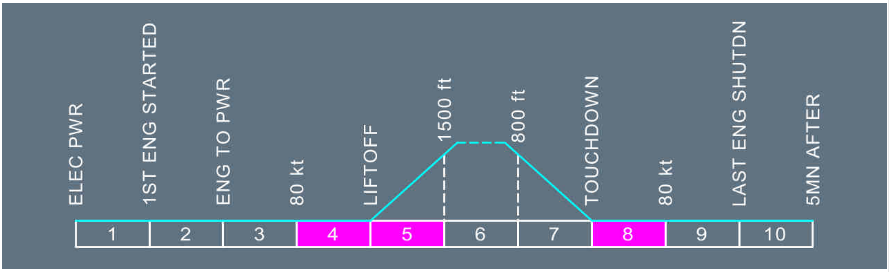
Ident.: PRO-ABN-FUEL-AC-00018058.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the trim tank isolation is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-AC-00019183.0001001 / 21 MAR 16

TRIM TANK FEED.. ISOL
APU MASTER SW.. OFF

- **IF T TK ISOL AFTER T.O.:**
  TRIM TANK FEED.. AUTO

  L2 Trim tank may be recovered after takeoff, if manual isolation was selected on ground.

Continued on the following page

FUEL TRIM LINE FAULT (Cont'd)
(TRIM TANK ISOLATION FAULT)

Ident.: PRO-ABN-FUEL-AC-00019460.0001001 / 21 MAR 16

STATUS

APPR PROC

- **IF T TANK NOT EMPTY:**
  T TANK FEED..ISOL

INOP SYS

FUEL AFT XFR
APU (When TTK isol)

FUEL TRIM TANK PUMP LO PR

Applicable to: ALL

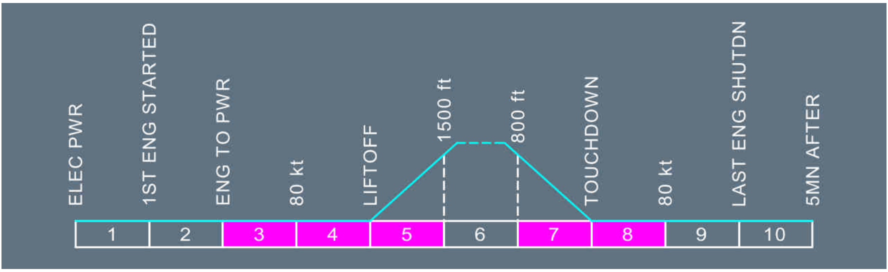
Ident.: PRO-ABN-FUEL-W-00018059.0001001 / 31 JAN 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when trim tank pump is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-W-00018147.0001001 / 21 MAR 16

T TANK MODE...AUTO
FWD XFR BY GRVTY ONLY

Continued on the following page

FUEL TRIM TANK PUMP LO PR ⊲ (Cont'd)

Ident.: PRO-ABN-FUEL-W-00019459.0001001 / 21 MAR 16

L12

STATUS

LVL OFF FOR MAN FWD XFR

The pitch attitude must be less than 3 ° to permit a fuel forward transfer by gravity.

INOP SYS

F T.TK PUMP

FUEL WING TK OVERFLOW

Applicable to: ALL

Ident.: PRO-ABN-FUEL-R-00018064.0001001 / 21 MAR 16

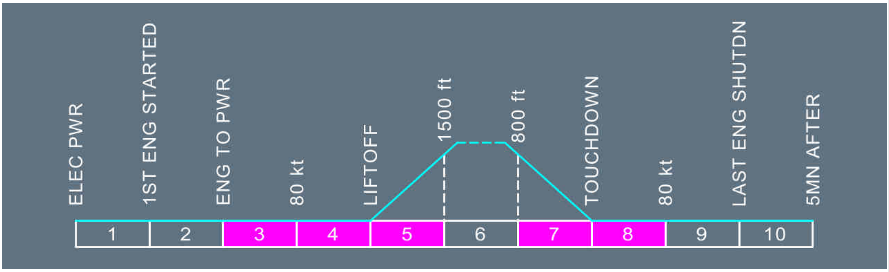
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one of the wing surge-tank overflow sensors has been wet for more than 25 s.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FUEL WING TK OVERFLOW (Cont'd)

Ident.: PRO-ABN-FUEL-R-00019452.0003001 / 21 MAR 16

L + R CTR PUMPS.....OFF

L2 *To stop the center to inner transfer.*

L1 T TANK MODE (ONLY IF CTR TANK EMPTY).....FWD

To force transfer into the center tank and prevent forward transfer into the inner tanks.

L2 *Note: If the trim tank pump is failed, this part of the procedure is replaced by:*

- ***WHEN SPD > 270 KT AND NOT IN CLIMB:***
  T TANK MODE.....FWD

L1
- **WHEN EITHER INR < 17 T:**
  L + R CTR PUMPS.....ON

Ident.: PRO-ABN-FUEL-R-00019449.0001001 / 21 MAR 16

L12

STATUS

- **WHEN SPD > 270 KT AND NOT IN CLIMB:**
  T TANK MODE.....FWD
  Displayed if the trim tank pump is failed.

FUEL WING X FEED FAULT

Applicable to: ALL

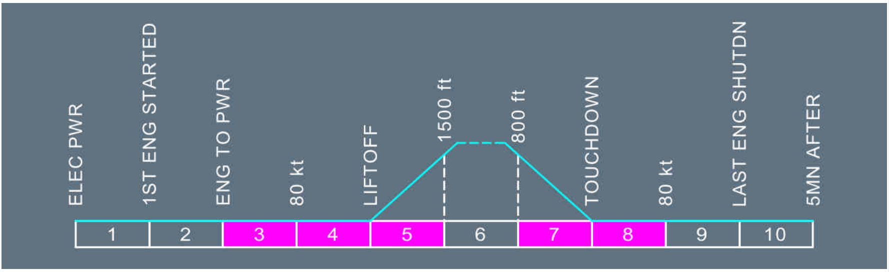
Ident.: PRO-ABN-FUEL-N-00018066.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the valve position disagrees with the selected position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-N-00019198.0001001 / 21 MAR 16

- **If the WING X FEED is failed open:**
  FUEL IMBALANCE.......... MONITOR
- **If the WING X FEED is failed closed:**
  FUEL IMBALANCE PROC.......... APPLY
  L2 *Refer to PRO-ABN-FUEL [QRH] FUEL IMBALANCE(WING X FEED failed closed case).*

Ident.: PRO-ABN-FUEL-N-00011254.0001001 / 13 AUG 10

STATUS

INOP SYS

F WING XFEED

FUEL ZFW ZFCG DISAGREE

Applicable to: ALL

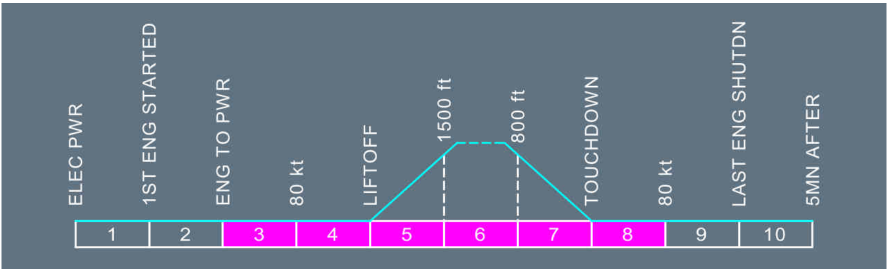
Ident.: PRO-ABN-FUEL-CA-00018068.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a discrepancy is detected between data (ZFW, ZFCG) of FMGEC 1 and data of FMGEC 2.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FUEL-CA-00019201.0004001 / 21 MAR 16

FMGEC VALUES..CONFIRM

L2 *Confirm that the ZFW and ZFCG from each FMGEC, the ECAM GW, and the ECAM CG are the same as the loadsheet values.*
If the difference between the ECAM CG and the loadsheet CG is less than 2 %, clear the ECAM caution.
If the difference is more than 2 %, Refer to PRO-ABN-ABN-RST System Reset Table - FUEL.

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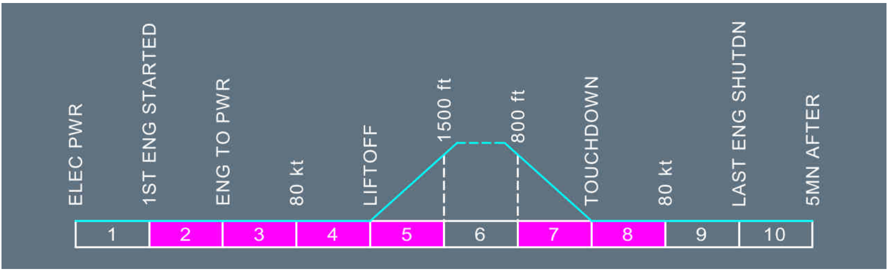
FWS ECP FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-M-00017512.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FWS-M-00010011.0001001 / 10 AUG 10

ECP KEYS AVAIL:
CLR, RCL, STS, ALL,
EMER CANC

L2 *CLR, STS, RECALL, EMERGENCY CANCEL, ALL keys are directly wired to the EIS computers.*

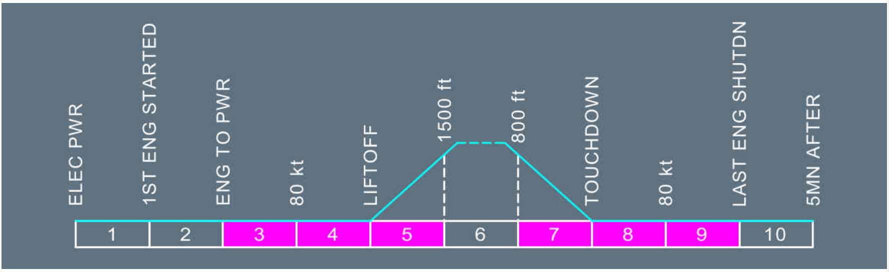
FWS FWC 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-C-00017513.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FWS-C-00010012.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-FWS-C-00010013.0001001 / 21 NOV 11

STATUS

	INOP SYS
CAT 3 SINGLE ONLY	FWC 1(2) CAT 3 DUAL

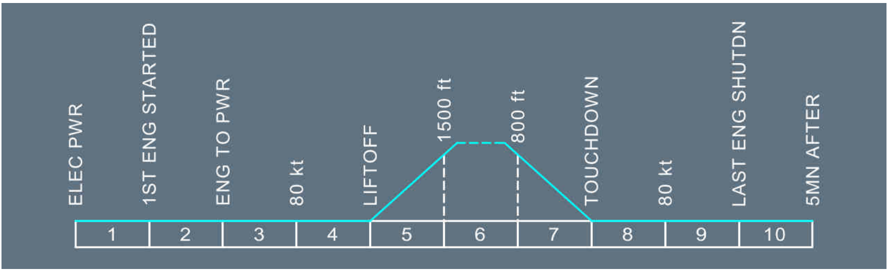
FWS FWC 1+2 FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-D-00017514.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FWS-D-00010014.0001001 / 14 FEB 13

MONITOR SYS
MONITOR OVERHEAD PANEL

NOT AVAIL

ECAM WARN
ALTI ALERT
STATUS
A/CALL OUT
MEMO

Continued on the following page

FWS FWC 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-FWS-D-00010015.0001001 / 14 FEB 13

Other INOP SYS

CAT2

ECAM Cautions and Warnings, aural warnings, master caution and warning lights are lost.
ECAM system pages are still available. Therefore check regularly (more often than usual) cockpit panels for local warnings and ECAM system pages for system checks.
Check the general status of the systems for the DES/APPR preparation.

FWS OEB/FWC DISCREPANCY

Applicable to: ALL

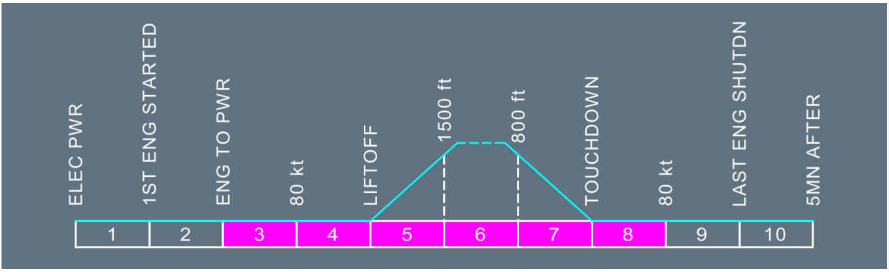
Ident.: PRO-ABN-FWS-N-00017515.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FWC1 and FWC2 do not have the same OEBs listed in their OEB reminder database.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

FWS OEB/FWC DISCREPANCY (Cont'd)

Ident.: PRO-ABN-FWS-N-00010031.0001001 / 17 MAR 11

OEB DATABASE.....X CHECK

L2 *This action is normally performed by maintenance*

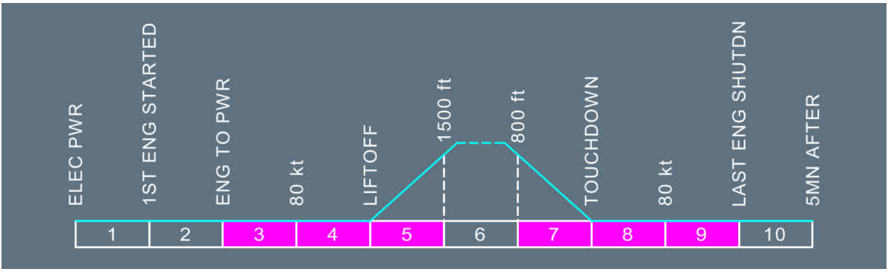
FWS SDAC 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-E-00017518.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FWS-E-00010016.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-FWS-E-00010017.0001001 / 10 AUG 10

L12

STATUS

	INOP SYS
	SDAC 1(2)

Note: *Although the ECAM may display some symbols and/or parameters in amber, this does not always signify that additional systems are failed.*

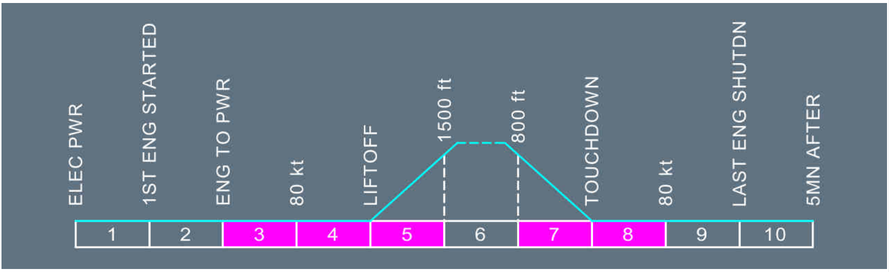
FWS SDAC 1+2 FAULT

Applicable to: ALL

Ident.: PRO-ABN-FWS-F-00017520.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-FWS-F-00010018.0001001 / 10 AUG 10

MONITOR OVERHEAD PANEL

L2 *Part of amber cautions is lost.*
All red warnings, engine and fuel parameters are available on ECAM upper DU.

L1 ECAM SYS PAGES AVAIL:
ENG, F/CTL, FUEL, WHEEL,
PRESS, C/B

Ident.: PRO-ABN-FWS-F-00010019.0001001 / 10 AUG 10

STATUS

INOP SYS

SDAC 1 + 2

HYD B ENG 1 PUMP LO PR

Applicable to: ALL

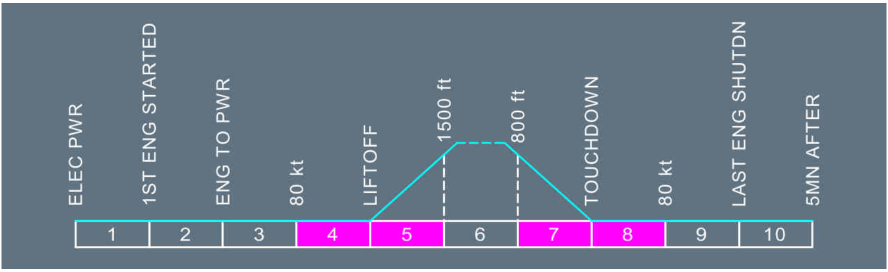
Ident.: PRO-ABN-HYD-O-00017401.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine pump pressure ≤ 1 450 PSI.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B ENG 1 PUMP LO PR (Cont'd)

Ident.: PRO-ABN-HYD-O-00011392.0004001 / 21 MAR 16

LAND ASAP

L2 “LAND ASAP” is only triggered, if the green hydraulic system is supplied by the RAT.

L1 BLUE ENG 1 PUMP.. OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by the RAT:**
  A/SKID NWS...OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR...1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B ENG 1 PUMP LO PR (Cont'd)

Ident.: PRO-ABN-HYD-O-00011393.0005001 / 21 MAR 16

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

- **If green HYD SYS is supplied by RAT:**

  MAX BRK PR.. 1000 PSI

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (2)

- **If green HYD SYS is supplied by RAT:**

  BRK B ACCU PR ONLY

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

See (4)

INOP SYS

BLUE HYD
PART SPLRS
REV 1 (PW or RR engines)
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)
B ENG 1 PUMP

(1) *(If green HYD SYS is supplied by RAT)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

(4) *Note: Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

HYD B RSVR LO AIR PR

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

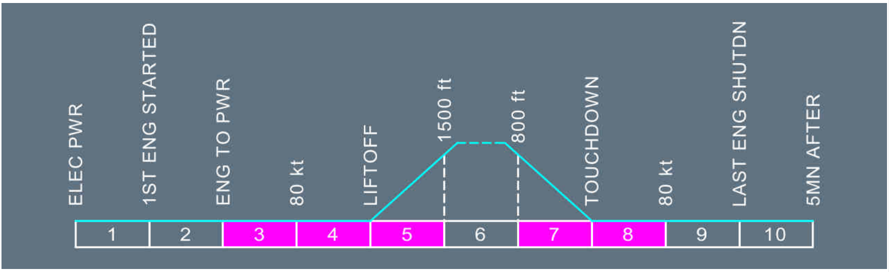
Ident.: PRO-ABN-HYD-D-00017403.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if pressure ≥ 25 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-D-00018950.0003001 / 03 NOV 22

LAND ASAP

L2 *LAND ASAP is only triggered, if the green hydraulic system is supplied by the RAT.*

L1
- **IF PRESS FLUCTUATES:**

  BLUE ENG 1 PUMP............OFF
  BLUE ELEC PUMP............OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by RAT:**

  A/SKID NWS............OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR............1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD B RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-D-00018951.0021001 / 22 MAR 17

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.
- **If G HYD SYS is supplied by RAT:**
  MAX BRK PR.. 1 000 PSI

APPR PROC

The possibility of cavitation increases with altitude. So, it may possible to restore the system after descending to a lower altitude.

BLUE ENG 1 PUMP..ON

- **IF HYD NOT RECOVERED:**
  LDG DIST PROC..APPLY

- **If G HYD SYS is supplied by RAT:**
  BRK B ACCU PR ONLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
PART SPLRS
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

(1) *(If G HYD SYS is supplied by RAT)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

Continued on the following page

HYD B RSVR LO AIR PR (Cont'd)

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B RSVR LO AIR PR

Applicable to: LV-KHT, LV-KHU

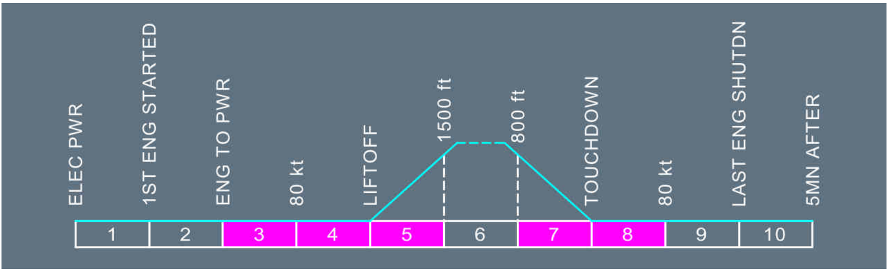
Ident.: PRO-ABN-HYD-D-00017403.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if pressure ≥ 25 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-D-00018950.0003001 / 03 NOV 22

LAND ASAP

L2 *LAND ASAP is only triggered, if the green hydraulic system is supplied by the RAT.*

L1
- **IF PRESS FLUCTUATES:**

  BLUE ENG 1 PUMP.....OFF
  BLUE ELEC PUMP.....OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**

  MAX SPEED..... *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by RAT:**

  A/SKID NWS.....OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR.....1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD B RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-D-00018951.0004001 / 22 MAR 17

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.
- **If G HYD SYS is supplied by RAT:**
  MAX BRK PR.. 1 000 PSI

APPR PROC

The possibility of cavitation increases with altitude. So, it may possible to restore the system after descending to a lower altitude.

BLUE ENG 1 PUMP.. ON

- **IF HYD NOT RECOVERED:**
  LDG DIST PROC.. APPLY

- **If G HYD SYS is supplied by RAT:**
  BRK B ACCU PR ONLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
PART SPLRS
REV 1
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

(1) *(If G HYD SYS is supplied by RAT)*
(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

Continued on the following page

HYD B RSVR LO AIR PR (Cont'd)

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B RSVR LO LVL

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

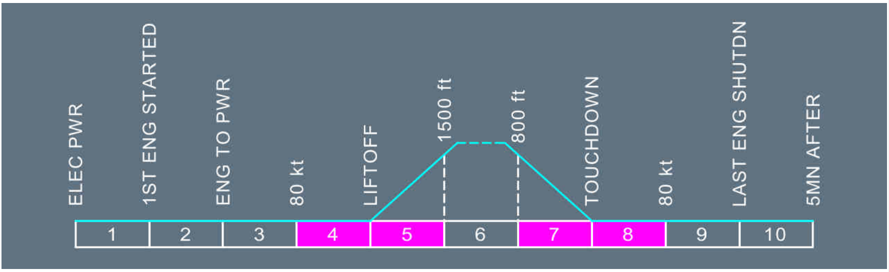
Ident.: PRO-ABN-HYD-F-00017404.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 5 l (1.32 US Gal).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-F-00018970.0003001 / 03 NOV 22

LAND ASAP

L2 *LAND ASAP is only triggered, if the green hydraulic system is supplied by the RAT.*

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:

- *A failed temperature transmitter of the reservoir, or*
- *A wiring fault between the HSMU and the temperature transmitter.*

L1 BLUE ENG 1 PUMP....................OFF
BLUE ELEC PUMP....................OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by RAT:**

  A/SKID NWS....................OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR....................1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD B RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-F-00018971.0004001 / 22 MAR 17

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

LDG DIST PROC.. APPLY

- **If G HYD SYS is supplied by RAT:**
  BRK B ACCU PR ONLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
PART SPLRS
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

(1) *(If G HYD SYS is supplied by RAT)*
(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B RSVR LO LVL

Applicable to: LV-KHT, LV-KHU

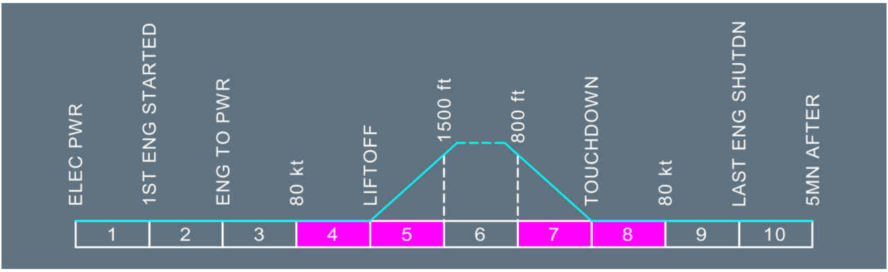
Ident.: PRO-ABN-HYD-F-00017404.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 5 l (1.32 US Gal).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-F-00018970.0003001 / 03 NOV 22

LAND ASAP

L2 *LAND ASAP is only triggered, if the green hydraulic system is supplied by the RAT.*

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:
- *A failed temperature transmitter of the reservoir, or*
- *A wiring fault between the HSMU and the temperature transmitter.*

L1 BLUE ENG 1 PUMP.. OFF
BLUE ELEC PUMP.. OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by RAT:**

  A/SKID NWS.. OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR.. 1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD B RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-F-00018971.0017001 / 22 MAR 17

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

LDG DIST PROC.. APPLY

- **If G HYD SYS is supplied by RAT:**

  BRK B ACCU PR ONLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
PART SPLRS
REV 1
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

(1) *(If G HYD SYS is supplied by RAT)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B RSVR OVHT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

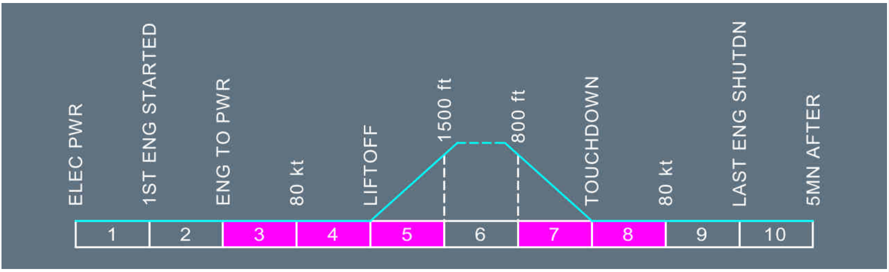
Ident.: PRO-ABN-HYD-E-00017405.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature ≥ 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-E-00018972.0003001 / 03 NOV 22

LAND ASAP

L2 *LAND ASAP is only triggered, if the green hydraulic system is supplied by the RAT.*
The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:

- *A failed temperature transmitter of the reservoir, or*
- *A wiring fault between the HSMU and the temperature transmitter.*

L1 BLUE ENG 1 PUMP...OFF
BLUE ELEC PUMP...OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by RAT:**
  A/SKID NWS...OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR...1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD B RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-E-00018973.0020001 / 22 MAR 17

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.
- **If G HYD SYS is supplied by RAT:**
  MAX BRK PR.. 1000 PSI

APPR PROC

- **IF BLUE OVHT OUT:**
  BLUE ENG 1 PUMP.. ON
- **IF HYD NOT RECOVERED:**
  LDG DIST PROC.. APPLY
- **If G HYD SYS is supplied by RAT:**
  BRK B ACCU PR ONLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
PART SPLRS
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

---

(1) *(If G HYD SYS is supplied by RAT)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B RSVR OVHT

Applicable to: LV-KHT, LV-KHU

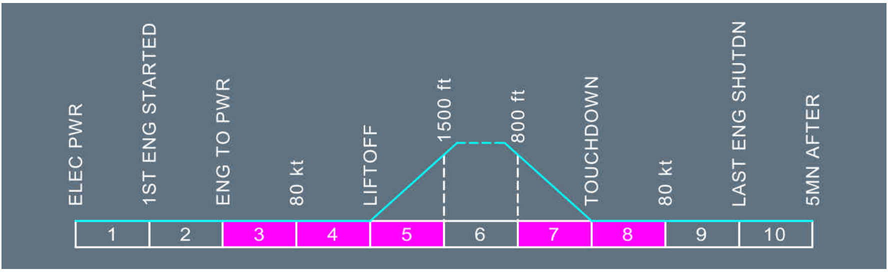
Ident.: PRO-ABN-HYD-E-00017405.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature ≥ 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-E-00018972.0003001 / 03 NOV 22

LAND ASAP

L2 *LAND ASAP is only triggered, if the green hydraulic system is supplied by the RAT.*
The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:

- *A failed temperature transmitter of the reservoir, or*
- *A wiring fault between the HSMU and the temperature transmitter.*

L1 BLUE ENG 1 PUMP.......... OFF
BLUE ELEC PUMP.......... OFF

ASSOCIATED PROCEDURES

B SYS LO PR

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.......... *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1
- **If G HYD SYS is supplied by RAT:**
  A/SKID NWS.......... OFF
  FUEL CONSUMPT INCRSD
  FMS PRED UNRELIABLE
  MAX BRK PR.......... 1000 PSI
  BRK B ACCU PR ONLY

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

Ident.: PRO-ABN-HYD-E-00018973.0019001 / 22 MAR 17

L12

STATUS

- **If F/CTL SLAT SYS 1 FAULT is triggered:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.
- **If G HYD SYS is supplied by RAT:**
  MAX BRK PR.. 1000 PSI

APPR PROC

- **IF BLUE OVHT OUT:**
  BLUE ENG 1 PUMP.. ON
- **IF HYD NOT RECOVERED:**
  LDG DIST PROC..APPLY
- **If G HYD SYS is supplied by RAT:**
  BRK B ACCU PR ONLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

SLATS SLOW

CAT 3 SINGLE ONLY

INOP SYS

BLUE HYD
PART SPLRS
REV 1
CAT 3 DUAL
ALTN BRK
AUTO BRK (1)
ANTI SKID (1)
NORM BRK (1)
N/W STRG (1)

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to a blue accumulator low pressure.*

(1) *(If G HYD SYS is supplied by RAT)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD G ENG 1 (2) PUMP LO PR

Applicable to: ALL

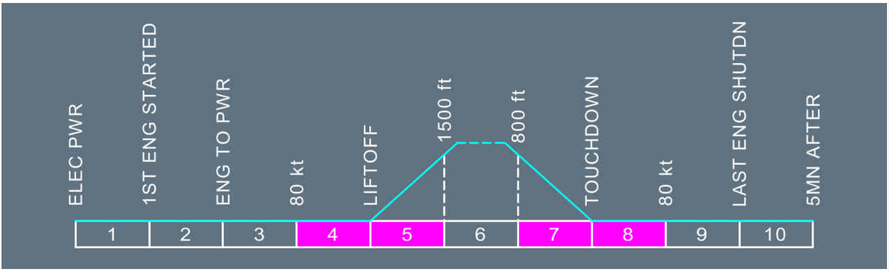
Ident.: PRO-ABN-HYD-W-00017406.0001001 / 01 DEC 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine pump pressure ≤ 1 450 PSI.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-HYD-W-00011384.0001001 / 18 AUG 10

GREEN ENG PUMP (AFFECTED)..OFF

Ident.: PRO-ABN-HYD-W-00011385.0001001 / 18 AUG 10

L12

STATUS

INOP SYS

G ENG 1(2)
PUMP

Note: *On ground, avoid retracting the FLAPS when the aircraft is moving, to prevent a loss of normal braking.*

HYD G ENG 1 + 2 PUMP LO PR

Applicable to: ALL

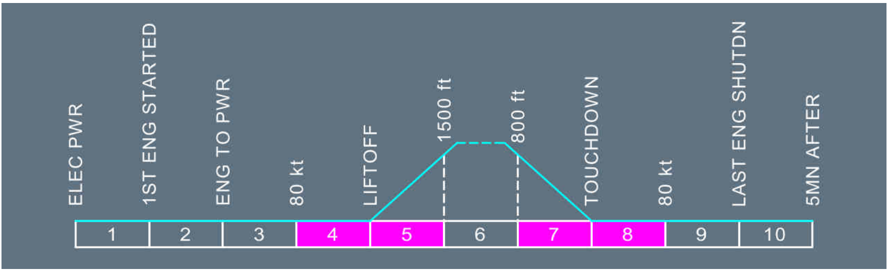
Ident.: PRO-ABN-HYD-M-00017407.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the green engines 1 and 2 pump pressure ≤ 1 450 PSI.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G ENG 1 + 2 PUMP LO PR (Cont'd)

Ident.: PRO-ABN-HYD-M-00019264.0003001 / 03 NOV 22

GREEN ENG 1 PUMP..OFF
GREEN ENG 2 PUMP..OFF

ASSOCIATED PROCEDURES

G SYS LO PR

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FUALT is triggered:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **WHEN AT TAXI SPEED:**

  ALTN N/W STRG ❄ ....ON

L2 *The flight crew may feel a slight jerk when system activates.*
This action supplies the nosewheel steering with the yellow hydraulic pressure.

L1 *Note: AUTO BRK system is not displayed as INOP SYS but remains inoperative.*

SECONDARY FAILURES

*F/CTL
*WHEEL

Continued on the following page

HYD G ENG 1 + 2 PUMP LO PR (Cont'd)

Ident.: PRO-ABN-HYD-M-00018974.0006001 / 21 MAR 16

L12

STATUS

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FAULT is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

- **FOR L/G GRAVITY EXTN:**

  MAX SPEED..200 KT
  L/G GRVTY EXTN.. DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G (lever)... DOWN
  LDG DIST PROC..APPLY

- **WHEN AT TAXI SPEED:**

  ALTN N/W STRG ✱ ....ON

  The flight crew may feel a slight jerk when system activates.
  This action supplies the Nosewheel Steering with the Yellow hydraulic pressure.

  Note: *AUTO BRK sys is not displayed as inop sys but remains inoperative.*

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

GREEN HYD
L/G RETRACT
PART SPLRS
CAT 3 DUAL
N/W STRG
AUTO BRK
NORM BRK
G ENG 1 PUMP
G ENG 2 PUMP

Continued on the following page

HYD G ENG 1 + 2 PUMP LO PR (Cont'd)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD G RSVR LO AIR PR

Applicable to: ALL

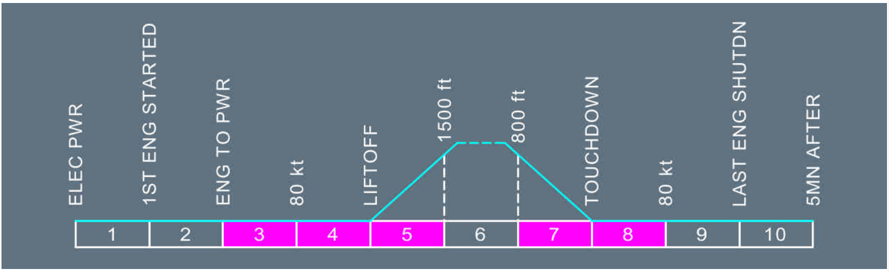
Ident.: PRO-ABN-HYD-A-00017411.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if pressure ≥ 25 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-A-00018977.0003001 / 03 NOV 22

- **IF PRESS FLUCTUATES:**
  GREEN ENG 1 PUMP.......................................OFF
  GREEN ENG 2 PUMP.......................................OFF
  GREEN ELEC PUMP.......................................OFF

ASSOCIATED PROCEDURES

G SYS LO PR

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FAULT is triggered:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **WHEN AT TAXI SPEED:**
  ALTN N/W STRG ....ON

L2 *The flight crew may feel a slight jerk when system activates.*
This action supplies the nosewheel steering with the yellow hydraulic pressure.

L1 *Note: AUTO BRK system is not displayed as INOP SYS but remains inoperative.*

SECONDARY FAILURES

*WHEEL
*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.
On ground, avoid retract the flaps when the aircraft is moving, to prevent a loss of alternate braking efficiency.

Continued on the following page

HYD G RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-A-00018978.0007001 / 03 NOV 22

L12

STATUS

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FAULT is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

The probability of cavitation increases with altitude. Therefore, it may be possible to restore the system after descending to a lower altitude.

GREEN ENG 1 PUMP.. ON
GREEN ENG 2 PUMP.. ON

- **IF HYD NOT RECOVERED:**
  - **FOR L/G GRVTY EXTN:**

    MAX SPEED.. 200 KT
    LDG GRVTY EXTN... DOWN

  - **WHEN L/G DOWNLOCKED:**

    L/G (LEVER)..DOWN
    LDG DIST PROC.. APPLY

  - **WHEN AT TAXI SPEED:**

    ALTN N/W STRG ◁ .... ON

    The flight crew may feel a slight jerk when system activates.
    This action supplies the nosewheel steering with the yellow hydraulic pressure.

    Note: *AUTO BRK system is not displayed as INOP SYS but remains inoperative.*

FUEL CONSUMPT INCRSD

INOP SYS

GREEN HYD
L/G RETRACT
PART SPLRS
CAT 3 DUAL
N/W STRG
AUTO BRK
NORM BRK

Continued on the following page

HYD G RSVR LO AIR PR (Cont'd)

See (1)

FMS PRED UNRELIABLE

See (2)

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD G RSVR LO LVL

Applicable to: ALL

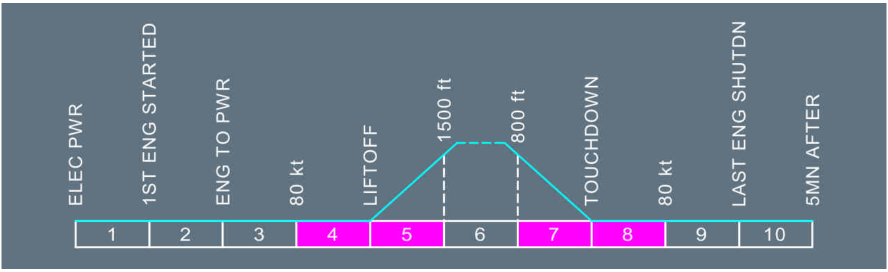
Ident.: PRO-ABN-HYD-C-00017412.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 8 l (2.11 US Gal).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-C-00018980.0003001 / 03 NOV 22

L2 The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:

- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 GREEN ENG 1 PUMP....................OFF
GREEN ENG 2 PUMP....................OFF
GREEN ELEC PUMP....................OFF

ASSOCIATED PROCEDURES

G SYS LO PR

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FUALT is triggered:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **WHEN AT TAXI SPEED:**

  ALTN N/W STRG ◁ ....ON

L2 *The flight crew may feel a slight jerk when system activates.*
This action supplies the nosewheel steering with the yellow hydraulic pressure.

L1 Note: *AUTO BRK system is not displayed as INOP SYS but remains inoperative.*

SECONDARY FAILURES

*WHEEL
*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.
On ground, avoid to retract the flaps when the aircraft is moving, to prevent a loss of alternate braking efficiency.

Continued on the following page

HYD G RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-C-00018981.0007001 / 21 MAR 16

L12

STATUS

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FAULT is triggered:**
  MAX SPEED.. REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

- **FOR L/G GRVTY EXTN:**
  MAX SPEED..200 KT
  LDG GRVTY EXTN..DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G (LEVER).. DOWN
  LDG DIST PROC...APPLY
- **WHEN AT TAXI SPEED:**
  ALTN N/W STRG ....ON
  The flight crew may feel a slight jerk when system activates.
  This action supplies the Nosewheel Steering with the Yellow hydraulic pressure.

  Note: *AUTO BRK sys is not displayed as inop sys but remains inoperative.*

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

SLATS/FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

GREEN HYD
L/G RETRACT
PART SPLRS
CAT 3 DUAL
N/W STRG
AUTO BRK
NORM BRK

Continued on the following page

HYD G RSVR LO LVL (Cont'd)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD G RSVR OVHT

Applicable to: ALL

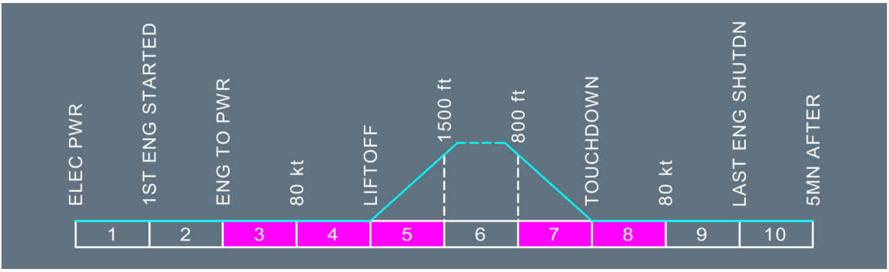
Ident.: PRO-ABN-HYD-B-00017413.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid temperature ≥ 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-B-00018983.0003001 / 03 NOV 22

L2 The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:

- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 GREEN ENG 1 PUMP..OFF
GREEN ENG 2 PUMP..OFF
GREEN ELEC PUMP..OFF

ASSOCIATED PROCEDURES

G SYS LO PR

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FAULT is triggered:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

- **WHEN AT TAXI SPEED:**

  ALTN N/W STRG ....ON

L2 *The flight crew may feel a slight jerk when system activates.*
This action supplies the nosewheel steering with the yellow hydraulic pressure.

L1 *Note:* *AUTO BRK system is not displayed as INOP SYS but remains inoperative.*

SECONDARY FAILURES

*WHEEL
*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.
On ground, avoid to retract the flaps when the aircraft is moving, to prevent a loss of alternate braking efficiency.

Continued on the following page

HYD G RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-B-00018984.0007001 / 03 NOV 22

L12

STATUS

- **If DC BUS 2 is lost or F/CTL FLAP SYS 1 FAULT is triggered:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

- **IF GREEN OVHT OUT:**

  GREEN ENG 1 PUMP..ON
  GREEN ENG 2 PUMP..ON

- **IF HYD NOT RECOVERED:**
  - **FOR L/G GRVTY EXTN:**

    MAX SPEED.. 200 KT
    LDG GRVTY EXTN....................................... DOWN

  - **WHEN L/G DOWNLOCKED:**

    L/G (LEVER)...DOWN
    LDG DIST PROC... APPLY

  - **WHEN AT TAXI SPEED:**

    ALTN N/W STRG ◁ .... ON

    The flight crew may feel a slight jerk when system activates.
    This action supplies the nosewheel steering with the yellow hydraulic pressure.

    Note: *AUTO BRK system is not displayed as INOP SYS but remains inoperative.*

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

INOP SYS

GREEN HYD
L/G RETRACT
PART SPLRS
CAT 3 DUAL
N/W STRG
AUTO BRK
NORM BRK

Continued on the following page

HYD G RSVR OVHT (Cont'd)

See [2]
SLATS/FLAPS SLOW
CAT 3 SINGLE ONLY

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD G RSVR UNDERFILLED
(ON GROUND)

Applicable to: ALL

Ident.: PRO-ABN-HYD-X-00017414.0001001 / 21 MAR 16

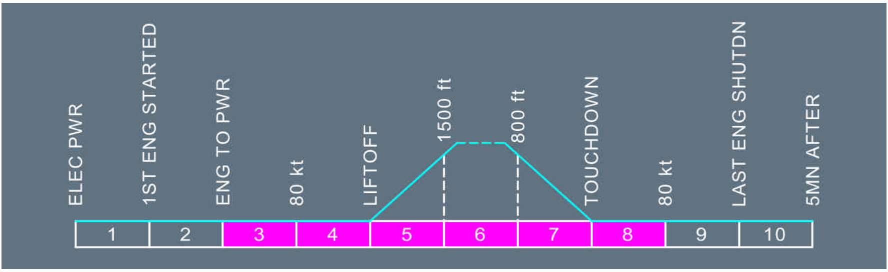
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers on ground:

- If the reservoir quantity is below 17 l when the temperature is above 0 °C, or
- If the reservoir quantity is below a quantity function of the temperature when the temperature is below 0 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G RSVR UNDERFILLED (Cont'd)
(ON GROUND)

Ident.: PRO-ABN-HYD-X-00018985.0001001 / 21 MAR 16

L2 Maintenance action is due.

HYD G SYS LEAK

Applicable to: ALL

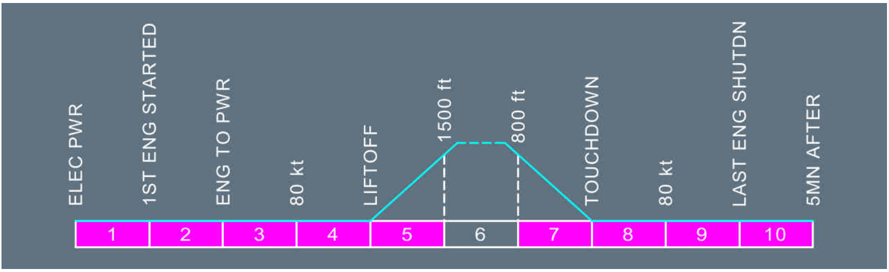
Ident.: PRO-ABN-HYD-Y-00017415.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers in flight with the same logic as the G RSVR UNDERFILLED alert.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-HYD-Y-00018986.0001001 / 03 NOV 22

LEAK RATE.......... MONITOR

- **IF LEVEL DECREASES:**

  GREEN ENG 1 PUMP.......... OFF

  GREEN ENG 2 PUMP.......... OFF

  - **If the GREEN ELEC PUMP is running:**

    GREEN ELEC PUMP.......... OFF

HYD G (B) (Y) ELEC PUMP FAULT

Applicable to: ALL

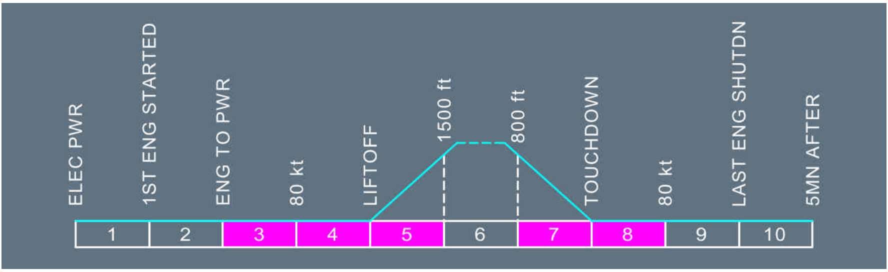
Ident.: PRO-ABN-HYD-J-00017416.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the G (B) (Y) electrical pump overheats or pressure is low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-HYD-J-00019365.0001001 / 21 MAR 16

AFFECTED ELEC PUMP...OFF

Ident.: PRO-ABN-HYD-J-00011381.0002001 / 18 AUG 10

STATUS

INOP SYS

G ELEC PUMP (B)(Y)

HYD Y ENG 2 PUMP LO PR

Applicable to: ALL

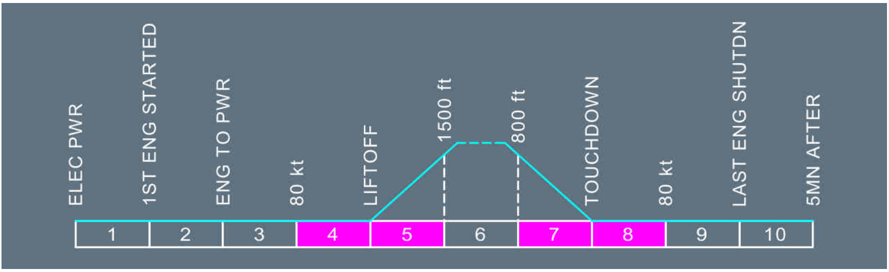
Ident.: PRO-ABN-HYD-Q-00017417.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the engine pump pressure ≤ 1 450 PSI.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-HYD-Q-00011396.0004001 / 21 MAR 16

LAND ASAP

L2 "LAND ASAP" is only triggered, if the green hydraulic system is supplied by the RAT.

L1 YELLOW ENG 2 PUMP..OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD Y ENG 2 PUMP LO PR (Cont'd)

Ident.: PRO-ABN-HYD-Q-00011397.0007001 / 21 MAR 16

L12

STATUS

- **If DC BUS 2 is lost:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
REV 2 (PW or RR engines)
CAT 3 DUAL
Y ENG 2 PUMP

---

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR LO AIR PR

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

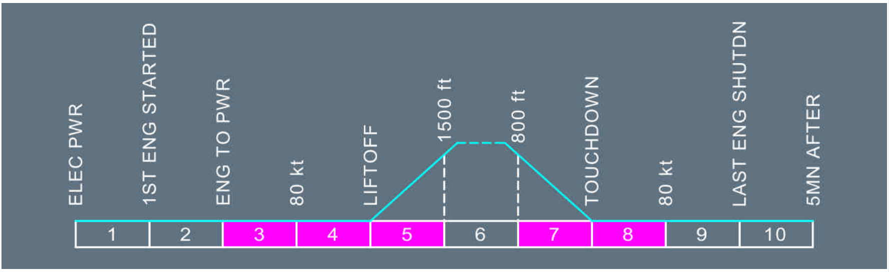
Ident.: PRO-ABN-HYD-G-00017419.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if air pressure ≥ 25 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00018991.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

L1
- **IF PRESS FLUCTUATES :**
  YELLOW ENG 2 PUMP.......................................OFF
  YELLOW ELEC PUMP.......................................OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00018992.0006001 / 22 MAR 17

L12

STATUS

- **If DC BUS 2 is lost:**

  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

The probability of cavitation increases with altitude. Therefore, it may be possible to restore the system after descending to a lower altitude.

YELLOW ENG 2 PUMP.. ON

- **IF HYD NOT RECOVERED:**

  LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
CAT 3 DUAL
CARGO DOORS (If Y LO LVL)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR LO AIR PR

Applicable to: LV-KHT, LV-KHU

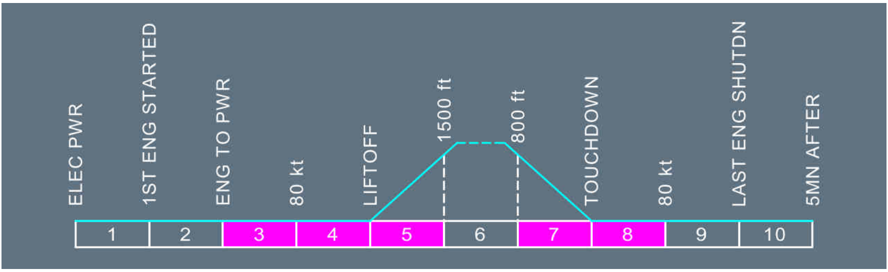
Ident.: PRO-ABN-HYD-G-00017419.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the reservoir air pressure ≤ 22 PSI (the alert resets if air pressure ≥ 25 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00018991.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

L1
- **IF PRESS FLUCTUATES :**

  YELLOW ENG 2 PUMP..OFF
  YELLOW ELEC PUMP..OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR LO AIR PR (Cont'd)

Ident.: PRO-ABN-HYD-G-00018992.0027001 / 22 MAR 17

L12

STATUS

- **If DC BUS 2 is lost:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

The probability of cavitation increases with altitude. Therefore, it may be possible to restore the system after descending to a lower altitude.

YELLOW ENG 2 PUMP.. ON

- **IF HYD NOT RECOVERED:**
  LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
REV 2
CAT 3 DUAL
CARGO DOORS (If Y LO LVL)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR LO LVL

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

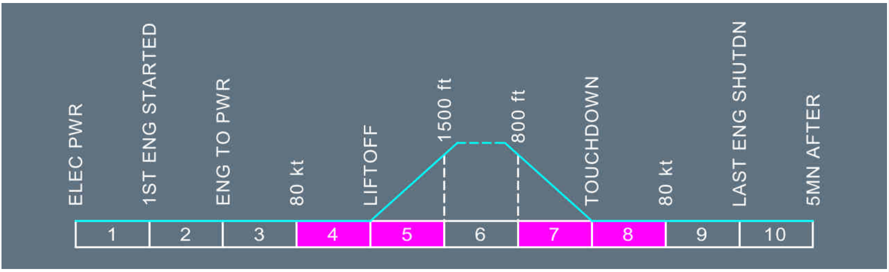
Ident.: PRO-ABN-HYD-I-00017420.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 5 l (1.32 US Gal).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00018993.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:
- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 YELLOW ENG 2 PUMP..OFF
YELLOW ELEC PUMP..OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**

  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

* F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00018994.0006001 / 22 MAR 17

L12

STATUS

- **If DC BUS 2 is lost:**

  MAX SPEED... *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
CAT 3 DUAL
CARGO DOORS (If Y LO LVL)

---

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR LO LVL

Applicable to: LV-KHT, LV-KHU

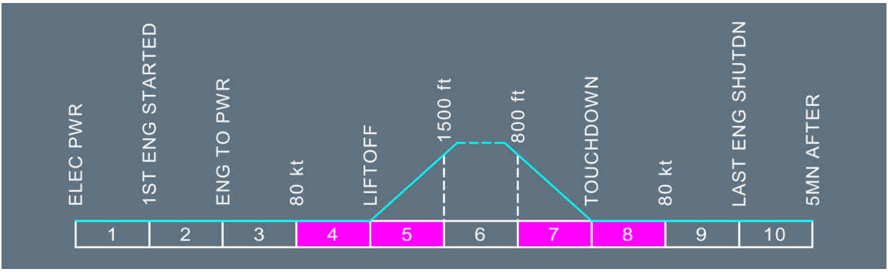
Ident.: PRO-ABN-HYD-I-00017420.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the fluid quantity < 5 l (1.32 US Gal).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00018993.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:
- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 YELLOW ENG 2 PUMP....................OFF
YELLOW ELEC PUMP....................OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

* F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR LO LVL (Cont'd)

Ident.: PRO-ABN-HYD-I-00018994.0027001 / 22 MAR 17

L12

STATUS

- **If DC BUS 2 is lost:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD
See [(1)]
FMS PRED UNRELIABLE
See [(2)]
FLAPS SLOW
CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
REV 2
CAT 3 DUAL
CARGO DOORS (If Y LO LVL)

---

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR OVHT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

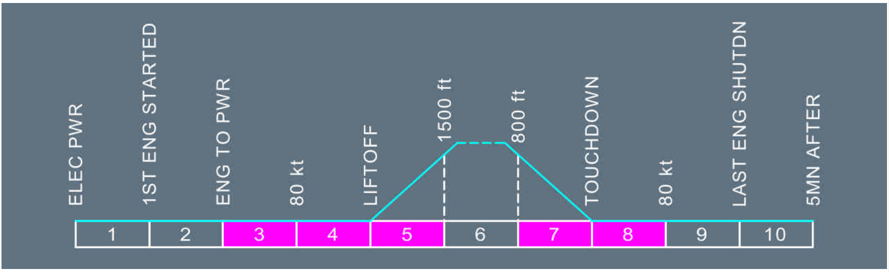
Ident.: PRO-ABN-HYD-H-00017421.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when fluid temperature ≥ 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018995.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:
- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 YELLOW ENG 2 PUMP.......................................OFF
YELLOW ELEC PUMP.......................................OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018996.0006001 / 22 MAR 17

L12

STATUS

- **If DC BUS 2 is lost:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

- **IF YELLOW OVHT OUT:**
  YELLOW ENG 2 PUMP..ON
- **IF HYD NOT RECOVERED:**
  LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
CAT 3 DUAL
CARGO DOORS (If Y LO LVL)

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR OVHT

Applicable to: LV-KHT

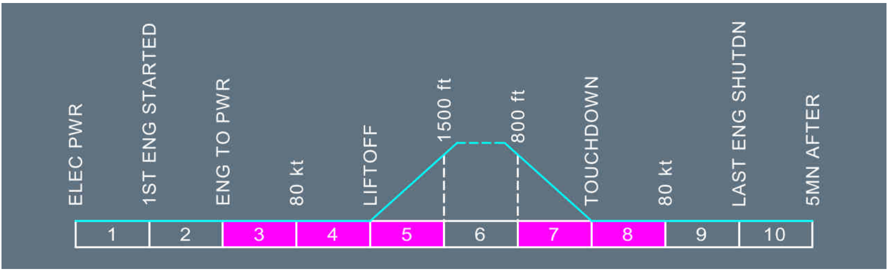
Ident.: PRO-ABN-HYD-H-00017421.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when fluid temperature ≥ 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018995.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:
- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 YELLOW ENG 2 PUMP....................OFF
YELLOW ELEC PUMP....................OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

  L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018996.0042001 / 03 MAY 23

L12

STATUS

- **If DC BUS 2 is lost:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

- **IF YELLOW OVHT OUT:**
  YELLOW ENG 2 PUMP..ON
- **IF HYD NOT RECOVERED:**
  LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
CAT 3 DUAL
CARGO DOORS (1)
REV 2

(1) *(If HYD Y RSVR LO LVL.)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD Y RSVR OVHT

Applicable to: LV-KHU

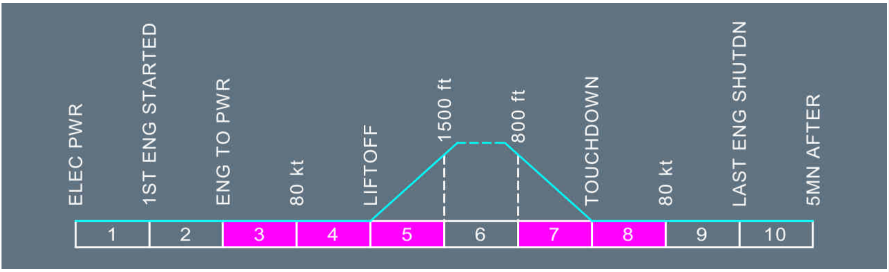
Ident.: PRO-ABN-HYD-H-00017421.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when fluid temperature ≥ 95 °C.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018995.0003001 / 03 NOV 22

LAND ASAP

L2 LAND ASAP is only triggered if the green hydraulic system is supplied by the RAT.

The ENG PUMP FAULT light may spuriously come on, without triggering the RSVR OVHT caution, in one of the following two cases:
- A failed temperature transmitter of the reservoir, or
- A wiring fault between the HSMU and the temperature transmitter.

L1 YELLOW ENG 2 PUMP.......................................OFF
YELLOW ELEC PUMP.......................................OFF

ASSOCIATED PROCEDURES

Y SYS LO PR

- **If the DC BUS 2 is lost:**
  MAX SPEED.................. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

SECONDARY FAILURES

*F/CTL

L2 As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily to retract the spoilers if they remain out after a hydraulic failure.

Continued on the following page

HYD Y RSVR OVHT (Cont'd)

Ident.: PRO-ABN-HYD-H-00018996.0027001 / 03 MAY 23

L12

STATUS

- **If DC BUS 2 is lost:**
  MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*
  Speed is limited in accordance with the slats/flaps configuration.

APPR PROC

- **IF YELLOW OVHT OUT:**
  YELLOW ENG 2 PUMP...ON
- **IF HYD NOT RECOVERED:**
  LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

FLAPS SLOW

CAT 3 SINGLE ONLY

INOP SYS

YELLOW HYD
PART SPLRS
CAT 3 DUAL
CARGO DOORS (1)

---

(1) *(If HYD Y RSVR LO LVL.)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B + Y SYS LO PR

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

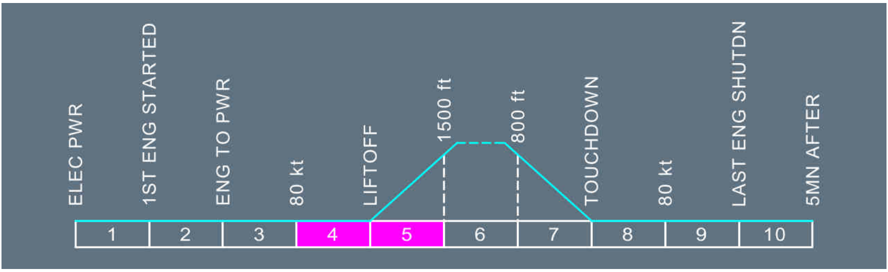
Ident.: PRO-ABN-HYD-V-00019409.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the blue and yellow systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018997.0010001 / 10 SEP 19

LAND ASAP

AFFECTED PUMPS.....OFF
MAX FL.....REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: *As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.*

L1 ● **IF TRIM LOCKED > 8 UP:**

MAX SPEED.....180 KT

L2 *Select the configuration, as appropriate. Fuel consumption is increased.*
Use manual thrust.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED.....330/.82

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018998.0006001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/0.82

- ● **IF TRIM LOCKED > 8 UP:**
  - MAX SPEED.. 180 KT

MANEUVER WITH CARE

APPR PROC

- ■ **If system lost by RSVR LO AIR PR:**
  - AFFECTED ENG PUMP.. ON
- ■ **If system lost by RSVR OVHT:**
  - ● **IF BLUE OVHT OUT:**
    - BLUE ENG 1 PUMP.. ON
  - ● **IF YELLOW OVHT OUT:**
    - YELLOW ENG 2 PUMP.. ON
- ■ **IF HYD NOT RECOVERED:**
  - PITCH AUTHORITY REDUCED

    Start the flare earlier. More stick deflection may be needed to achieve the flare.
  - GPWS FLAP MODE.. OFF
  - FOR LDG.. USE FLAP 2

    This line is replaced by “FOR LDG: USE FLAP 2” when CONF 2 is selected, as a reminder.
    Due to loss of the stabilizer, do not select CONF FULL or 3, so as not to degrade handling qualities.
  - ● **FOR L/G GRVTY EXTN:**
    - MAX SPEED.. 200 KT
    - LDG GRVTY EXTN.. DOWN
  - ● **WHEN L/G DOWNLOCKED:**
    - L/G (LEVER).. DOWN
  - APPR SPD.. VLS + 10 KT

INOP SYS

F/CTL PROT
STABILIZER
B + Y HYD
AP 1 + 2
MOST SPLRS
ALTN BRK
CARGO DOORS (If Y LO LVL)
N/W STRG
CAT 2

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Approach speed is increased, due to partial loss of spoilers and stabilizer.

LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

ALTN LAW: PROT LOST

SLATS/FLAPS SLOW

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to blue accumulator low pressure.*

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B + Y SYS LO PR

Applicable to: LV-FVI, LV-KAN, LV-KAO

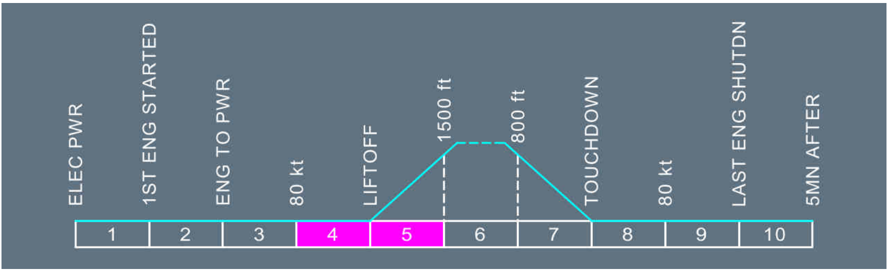
Ident.: PRO-ABN-HYD-V-00019409.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the blue and yellow systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018997.0002001 / 22 MAR 17

LAND ASAP

AFFECTED PUMPS...OFF
MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

L1 ● **IF TRIM LOCKED > 8 UP:**

MAX SPEED...180 KT

L2 *Select the configuration, as appropriate. Fuel consumption is increased.*
Use manual thrust.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED...330/.82

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018998.0006001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/0.82

- **IF TRIM LOCKED > 8 UP:**
  MAX SPEED.. 180 KT

MANEUVER WITH CARE

APPR PROC

- **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP.. ON
- **If system lost by RSVR OVHT:**
  - **IF BLUE OVHT OUT:**
    BLUE ENG 1 PUMP.. ON
  - **IF YELLOW OVHT OUT:**
    YELLOW ENG 2 PUMP.. ON
- **IF HYD NOT RECOVERED:**
  PITCH AUTHORITY REDUCED

  Start the flare earlier. More stick deflection may be needed to achieve the flare.

  GPWS FLAP MODE... OFF
  FOR LDG.. USE FLAP 2

  This line is replaced by “FOR LDG: USE FLAP 2” when CONF 2 is selected, as a reminder.
  Due to loss of the stabilizer, do not select CONF FULL or 3, so as not to degrade handling qualities.

  - **FOR L/G GRVTY EXTN:**
    MAX SPEED.. 200 KT
    LDG GRVTY EXTN... DOWN
  - **WHEN L/G DOWNLOCKED:**
    L/G (LEVER)... DOWN

  APPR SPD... VLS + 10 KT

INOP SYS

F/CTL PROT
STABILIZER
B + Y HYD
AP 1 + 2
MOST SPLRS
ALTN BRK
CARGO DOORS (If Y LO LVL)
N/W STRG
CAT 2

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Approach speed is increased, due to partial loss of spoilers and stabilizer.

LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

ALTN LAW: PROT LOST

SLATS/FLAPS SLOW

Note: Following a blue hydraulic system failure, the parking brake may be inoperative due to blue accumulator low pressure.

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B + Y SYS LO PR

Applicable to: LV-KHT

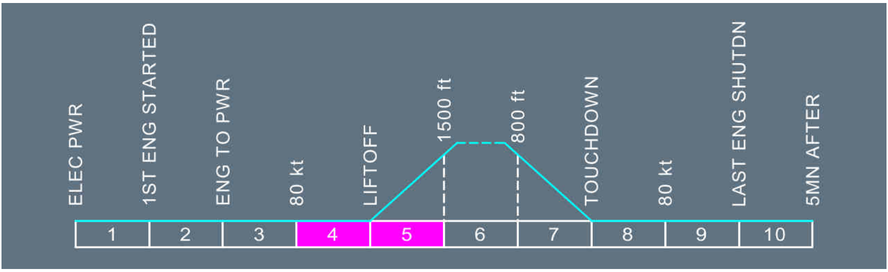
Ident.: PRO-ABN-HYD-V-00019409.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the blue and yellow systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
6
7
8
9
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Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018997.0010001 / 10 SEP 19

LAND ASAP

AFFECTED PUMPS......OFF
MAX FL......REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: *As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.*

L1 ● **IF TRIM LOCKED > 8 UP:**

MAX SPEED...... 180 KT

L2 *Select the configuration, as appropriate. Fuel consumption is increased.*
Use manual thrust.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED......330/.82

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018998.0029001 / 22 MAR 17

L12

STATUS

MAX SPEED... 330/0.82

- **IF TRIM LOCKED > 8 UP:**
  MAX SPEED.. 180 KT

MANEUVER WITH CARE

APPR PROC

- **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP.. ON
- **If system lost by RSVR OVHT:**
  - **IF BLUE OVHT OUT:**
    BLUE ENG 1 PUMP..ON
  - **IF YELLOW OVHT OUT:**
    YELLOW ENG 2 PUMP....................................... ON
- **IF HYD NOT RECOVERED:**
  PITCH AUTHORITY REDUCED

  Start the flare earlier. More stick deflection may be needed to achieve the flare.

  GPWS FLAP MODE..OFF
  FOR LDG...USE FLAP 2

  This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.
  Due to loss of the stabilizer, do not select CONF FULL or 3, so as not to degrade handling qualities.

  - **FOR L/G GRVTY EXTN:**
    MAX SPEED... 200 KT
    LDG GRVTY EXTN.. DOWN
  - **WHEN L/G DOWNLOCKED:**
    L/G (LEVER)...DOWN

  APPR SPD... VLS + 10 KT

INOP SYS

F/CTL PROT
STABILIZER
B + Y HYD
AP 1 + 2
MOST SPLRS
REVERSES
ALTN BRK
CARGO DOORS (If Y LO LVL)
N/W STRG
CAT 2

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Approach speed is increased, due to partial loss of spoilers and stabilizer.

LDG DIST PROC..APPLY

FUEL CONSUMPT INCRSD

See [(1)]

FMS PRED UNRELIABLE

See [(2)]

ALTN LAW: PROT LOST

SLATS/FLAPS SLOW

Note: Following a blue hydraulic system failure, the parking brake may be inoperative due to blue accumulator low pressure.

[(1)] *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

[(2)] *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD B + Y SYS LO PR

Applicable to: LV-KHU

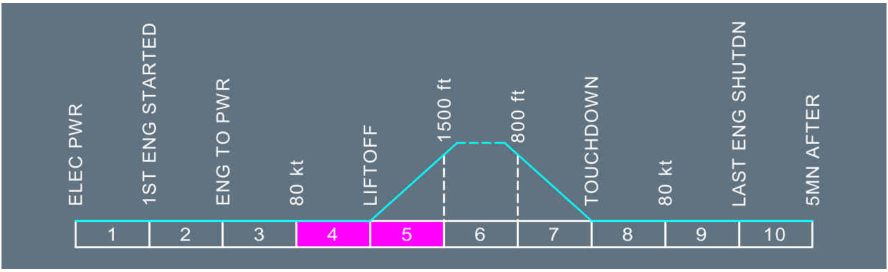
Ident.: PRO-ABN-HYD-V-00019409.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the blue and yellow systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018997.0002001 / 22 MAR 17

LAND ASAP

AFFECTED PUMPS..........OFF
MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

L1 ● **IF TRIM LOCKED > 8 UP:**
MAX SPEED..........180 KT

L2 *Select the configuration, as appropriate. Fuel consumption is increased.*
Use manual thrust.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED..........330/.82

SECONDARY FAILURES

*F/CTL

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-V-00018998.0029001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/0.82

- **IF TRIM LOCKED > 8 UP:**
  MAX SPEED.. 180 KT

MANEUVER WITH CARE

APPR PROC

- **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP.. ON
- **If system lost by RSVR OVHT:**
  - **IF BLUE OVHT OUT:**
    BLUE ENG 1 PUMP..ON
  - **IF YELLOW OVHT OUT:**
    YELLOW ENG 2 PUMP.. ON
- **IF HYD NOT RECOVERED:**
  PITCH AUTHORITY REDUCED

  Start the flare earlier. More stick deflection may be needed to achieve the flare.

  GPWS FLAP MODE...OFF
  FOR LDG...USE FLAP 2

  This line is replaced by “FOR LDG: USE FLAP 2” when CONF 2 is selected, as a reminder.
  Due to loss of the stabilizer, do not select CONF FULL or 3, so as not to degrade handling qualities.

  - **FOR L/G GRVTY EXTN:**
    MAX SPEED.. 200 KT
    LDG GRVTY EXTN... DOWN
  - **WHEN L/G DOWNLOCKED:**
    L/G (LEVER)..DOWN

  APPR SPD... VLS + 10 KT

INOP SYS

F/CTL PROT
STABILIZER
B + Y HYD
AP 1 + 2
MOST SPLRS
REVERSES
ALTN BRK
CARGO DOORS (If Y LO LVL)
N/W STRG
CAT 2

Continued on the following page

HYD B + Y SYS LO PR (Cont'd)

Approach speed is increased, due to partial loss of spoilers and stabilizer.

LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

ALTN LAW: PROT LOST

SLATS/FLAPS SLOW

Note: Following a blue hydraulic system failure, the parking brake may be inoperative due to blue accumulator low pressure.

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

HYD G + B SYS LO PR

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

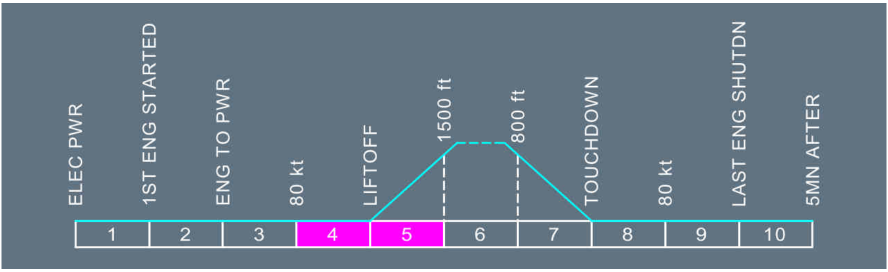
Ident.: PRO-ABN-HYD-T-00019410.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the green and blue systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

HYD G + B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-T-00019009.0015001 / 10 SEP 19

LAND ASAP

RAT..MAN ON

L2 *"RAT MAN ON" is only triggered, in case of a G + B hydraulic system low level.*

L1 CONSIDER RAT MAN USE

L2 *"CONSIDER RAT MAN USE" is not triggered in case of a green reservoir overheat, or a green hydraulic system low level.*

Note: With the RAT extended, the green system is recovered. This permits slat extension recovery. However, green pressure will be lost when the speed drops below 140 kt. At a time, the red "HYD G + B SYS LO PR" warning will be triggered again, and antiskid will be lost. To anticipate the lost of antiskid, the ECAM "HYD B RSVR LO AIR PR/OVHT/LO LVL" procedure requests to select it OFF. With the RAT extended, fuel consumption increases by approximately 1 %.

L1 ● **If "RAT .... MAN ON" or "CONSIDER RAT MAN USE" action lines are displayed:**

MIN RAT SPEED..140 KT

AFFECTED PUMPS..OFF

SPD BRK..DO NOT USE

L2 *Due to the loss of one elevator.*

L1 MAX FL...REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED....................330/.82

SECONDARY FAILURES

*WHEEL
*F/CTL

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-T-00019010.0019001 / 03 NOV 22

L12

STATUS

SPD BRK .... DO NOT USE
MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

Speed is limited in accordance with the slats/flaps configuration.

MANEUVER WITH CARE
MAX BRK PR... 1 000 PSI
MIN RAT SPEED (IF RAT EXTENDED)...................... 140 KT

APPR PROC

- **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP...ON
- **If system lost by RSVR OVHT:**
  - **IF GREEN OVHT OUT:**
    GREEN ENG 1 PUMP.. ON
    GREEN ENG 2 PUMP.. ON
  - **IF BLUE OVHT OUT:**
    BLUE ENG 1 PUMP...ON
- **If HYD not recovered:**
  - **BEFORE S/F EXTENSION:**
    - **If ENG 1 S/D:**
      BLUE ELEC PUMP...................................... OFF
      Switch OFF the blue electrical pump to avoid flight control jerk.
  - **If slats and flaps are jammed in CONF 0:**
    GPWS FLAP MODE... OFF
    FOR LDG... USE FLAP 1
    This line is replaced by “FOR LDG : USE FLAP 1” when CONF 1 is selected, as a reminder.

INOP SYS

F/CTL PROT
G + B HYD
ANTI SKID
L/G RETRACT
AP 1 + 2
SLATS
L ELEV
MOST SPLRS
REV 1 (1)
L + R INR AIL
N/W STRG
AUTO BRK
NORM BRK
ALTN BRK
CAT 2

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

NO S/F LDG PROC.. APPLY

Refer to PRO-ABN-F_CTL [QRH] No Flaps no Slats Landing.

- **If slats and flaps are not jammed in CONF 0:**
  - **If slats position < 2:**

    GPWS FLAP MODE.................................... OFF
    FOR LDG.......................................USE FLAP 2

    This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.

  - **If slats position ≥ 2:**

    FOR LDG.......................................USE FLAP 3

    This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

  S/F JAMMED PROC..................................... APPLY

  Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.

- **FOR L/G GRVTY EXTN:**

  MAX SPEED... 200 KT
  LDG GRVTY EXTN...................................... DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G LEVER.. DOWN

  - **If slats position ≥ 1:**

    APPR SPD.................................... VLS + 10 KT

    Approach speed must be increased due to the loss of one elevator.

- **AT LDG ROLL:**

  DIFF BRAKING... AS RQRD

LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

ALTN LAW: PROT LOST
CONSIDER RAT MAN USE
See (4)
BRK B ACCU PR ONLY
See (5)
FLAPS SLOW

Note: *Following a blue hydraulic system failure, the parking brake may be inoperative due to blue accumulator low pressure.*

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(1) *(If PW/RR engines.)*
(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.*
(4) *This line is not displayed in the case of a green reservoir overheat or a green hydraulic system low level.*
(5) *7 full brake applications are available.*

HYD G + B SYS LO PR

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

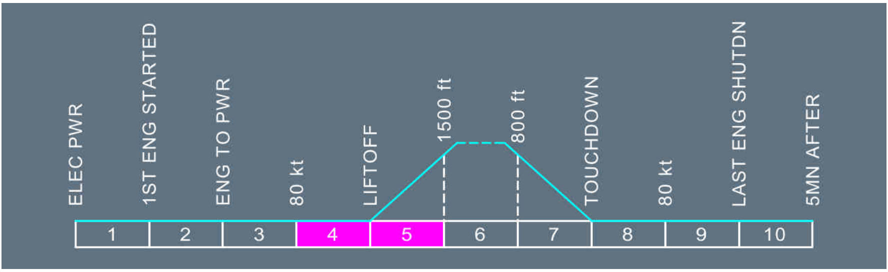
Ident.: PRO-ABN-HYD-T-00019410.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the green and blue systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
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Continued on the following page

HYD G + B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-T-00019009.0013001 / 22 MAR 17

LAND ASAP

RAT.. MAN ON

L2 *"RAT MAN ON" is only triggered, in case of a G + B hydraulic system low level.*

L1 CONSIDER RAT MAN USE

L2 *"CONSIDER RAT MAN USE" is not triggered in case of a green reservoir overheat, or a green hydraulic system low level.*

L12

Note: To extend the RAT, the flight crew must press the RAT MAN ON pb located on the Hydraulic overhead panel.
With the RAT extended, the green system is recovered. This permits slat extension recovery. However, green pressure will be lost when the speed drops below 140 kt.
At a time, the red " G + B SYS LO PR" warning will be triggered again, and antiskid will be lost. To anticipate the lost of antiskid, the ECAM "HYD B RSVR LO AIR PR/OVHT/LO LVL" procedure requests to select it OFF. With the RAT extended, fuel consumption increases by approximately 1 %.

L1 MIN RAT SPEED.. 140 KT

L2 *Note: The "MIN RAT SPEED .... 140 kt" action line is displayed if the "RAT .... MAN ON" action line or the "CONSIDER RAT MAN USE" action line is displayed.*

L1 .AFFECTED PUMPS.. OFF
SPD BRK.. DO NOT USE

L2 *Due to the loss of one elevator.*

L1 MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers if they remain out after a hydraulic failure.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED...330/.82

SECONDARY FAILURES

*WHEEL
*F/CTL

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-T-00019010.0010001 / 03 NOV 22

L12

STATUS

SPD BRK..DO NOT USE
MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

Speed is limited in accordance with the slats/flaps configuration.

MANEUVER WITH CARE
MAX BRK PR... 1 000 PSI
MIN RAT SPEED (IF RAT EXTENDED)..................... 140 KT

APPR PROC

- **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP...ON
- **If system lost by RSVR OVHT:**
  - **IF GREEN OVHT OUT:**
    GREEN ENG 1 PUMP.. ON
    GREEN ENG 2 PUMP.. ON
  - **IF BLUE OVHT OUT:**
    BLUE ENG 1 PUMP...ON
- **If HYD not recovered:**
  - **BEFORE S/F EXTENSION:**
    - **If ENG 1 S/D:**
      BLUE ELEC PUMP.....................................OFF
      Switch OFF the blue electrical pump to avoid flight control jerk.

  GPWS FLAP MODE (IF S < 2).................................OFF
  S/F JAMMED PROC...APPLY
  Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.
  FOR LDG (IF S < 2)................................... USE FLAP 2

INOP SYS

F/CTL PROT
G + B HYD
ANTI SKID
L/G RETRACT
AP 1 + 2
SLATS
L ELEV
MOST SPLRS
REV 1 (1)
L + R INR AIL
N/W STRG
AUTO BRK
NORM BRK
ALTN BRK
CAT 2

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

This line is replaced by “FOR LDG: USE FLAP 2” when CONF 2 is selected, as a reminder.

FOR LDG (IF S ≥ 2)................................... USE FLAP 3

This line is replaced by “FOR LDG: USE FLAP 3” when CONF 3 is selected, as a reminder.

- **FOR L/G GRVTY EXTN:**

  MAX SPEED.. 200 KT
  LDG GRVTY EXTN....................................... DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G LEVER.. DOWN
  APPR SPD (IF S ≥ 1)........................... VLS + 10 KT

  Approach speed must be increased, due to the loss of one elevator.

  LDG DIST PROC.. APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

ALTN LAW: PROT LOST

CONSIDER RAT MAN USE

See (4)

BRK B ACCU PR ONLY

See (5)

FLAPS SLOW

Note: Following a blue hydraulic system failure, the parking brake may be inoperative due to blue accumulator low pressure.

(1) *(If PW/RR engines.)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

(4) *“CONSIDER RAT MAN USE” is not triggered, in case of a green reservoir overheat or a green hydraulic system low level.*

Continued on the following page

HYD G + B SYS LO PR (Cont'd)

(5) *7 full brake applications are available.*

HYD G + Y SYS LO PR

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

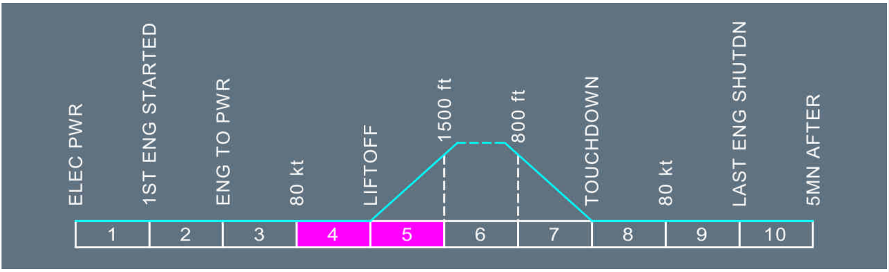
Ident.: PRO-ABN-HYD-U-00019411.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the green and yellow systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-U-00019133.0020001 / 10 SEP 19

LAND ASAP

RAT..MAN ON

L2 *"RAT MAN ON" is only triggered, on the ECAM in case of G + Y hydraulic system low level.*

L1 CONSIDER RAT MAN USE

L2 *"CONSIDER RAT MAN USE" is not triggered, in case of a green reservoir overheat, or in case of a green hydraulic system low level.*

Note: With RAT extended, the green system is recovered. This permits to recover the flap extensions. However, green pressure will be lost when the speed will drop below 140 kt. At the time, the red warning "G + Y SYS LO PR" will be triggered again. With RAT extended, the fuel consumption is approximately increased by 1 %.

L1 ● **If "RAT .... MAN ON" or "CONSIDER RAT MAN USE" action lines are displayed:**

MIN RAT SPEED..140 KT

AFFECTED PUMPS..OFF
SPD BRK..DO NOT USE

L2 *Due to the loss of one elevator.*

L1 MAX FL.. REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers, if they remain out after a hydraulic failure.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

MAX SPEED..330/.82

SECONDARY FAILURES

* WHEEL
* F.CTL

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-U-00019134.0022001 / 03 NOV 22

L12

STATUS

SPD BRK...DO NOT USE
MAX SPEED.. *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

Speed is limited in accordance with the slats/flaps configuration.

MANEUVER WITH CARE
MIN RAT SPEED (IF RAT EXTENDED)...................... 140 KT

APPR PROC

- ■ **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP.. ON
- ■ **If system lost by RSVR OVHT:**
  - ● **IF GREEN OVHT OUT:**
    GREEN ENG 1 PUMP... ON
    GREEN ENG 2 PUMP... ON
  - ● **IF YELLOW OVHT OUT:**
    YELLOW ENG 2 PUMP....................................... ON
- ■ **IF HYD NOT RECOVERED:**
  - ● **BEFORE S/F EXTENSION:**
    - ● **If ENG 2 S/D:**
      YELLOW ELEC PUMP.................................OFF
      Switch OFF the yellow electrical pump to avoid flight control jerk in the case that engine 2 is lost.
  - ● **If flaps position is not 3 or FULL:**
    GPWS FLAP MODE...OFF
  - ● **If slats and flaps are jammed in CONF 0:**
    FOR LDG... USE FLAP 1

INOP SYS

F/CTL PROT
G + Y HYD
L/G RETRACT
AP 1 + 2
FLAPS
L + R OUTR AIL
R ELEV
MOST SPLRS
N/W STRG
AUTO BRK
NORM BRK
CARGO DOORS (If Y LO LVL.)
CAT 2
REV 2 (1)

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

This line is replaced by "FOR LDG: USE FLAP 1" when CONF 1 is selected, as a reminder.

NO S/F LDG PROC....................................... APPLY

Refer to PRO-ABN-F_CTL [QRH] No Flaps no Slats Landing.

- **If slats and flaps are not jammed in CONF 0:**
  - **If flaps position < 3:**

    FOR LDG....................................... USE FLAP 2

    This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder. Selecting FLAP 2, instead of FLAP 3, permits VMAX display on PFD to increase.
  - **If flaps position = 3:**

    FOR LDG....................................... USE FLAP 3

    This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
  - **If flaps position > 3:**

    FOR LDG................................. USE FLAP FULL

    This line is replaced by "FOR LDG: USE FLAP FULL" when CONF FULL is selected, as a reminder.

  S/F JAMMED PROC....................................... APPLY

  Refer to PRO-ABN-F_CTL [QRH] Landing with Slats or Flaps Jammed.
- **FOR LDG GRVTY EXTN:**

  MAX SPEED... 200 KT

  LDG GRVTY EXTN....................................... DOWN
- **WHEN L/G DOWNLOCKED:**

  L/G LEVER.. DOWN
- **If 1+F ≤ flaps position < 2:**

  APPR SPD... VLS + 5 KT

  Approach speed increases due to the loss of one elevator.

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

- **If flaps position ≥ 2:**

  APPR SPD.. VLS + 10 KT

  Approach speed increases due to the loss of one elevator.

LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

ALTN LAW: PROT LOST

CONSIDER RAT MAN USE

See (4)

SLATS SLOW

(1) *(If PW/RR engines.)*

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable fuel penalty factor.*

(4) *This line is not displayed in the case of a green reservoir overheat, or in the case of a green hydraulic system low level.*

HYD G + Y SYS LO PR

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

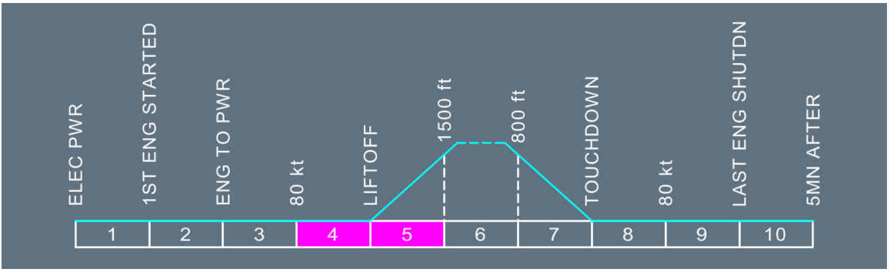
Ident.: PRO-ABN-HYD-U-00019411.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the green and yellow systems pressure ≤ 1 450 PSI (the alert resets if the pressure ≥ 1 750 PSI).

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-U-00019133.0006001 / 22 MAR 17

LAND ASAP

RAT...MAN ON

L2 - *“RAT MAN ON” is only triggered, on the ECAM in case of G + Y hydraulic system low level.*

L1 CONSIDER RAT MAN USE

L2 - *"CONSIDER RAT MAN USE" is not triggered, in case of a green reservoir overheat, or in case of a green hydraulic system low level.*

Note: *To extend the RAT, the flight crew must press the RAT MAN ON pb located on the Hydraulic overhead panel.*
With RAT extended, the green system is recovered. This permits to recover the flap extensions.
However, green pressure will be lost when the speed will drop below 140 kt.
At the time, the red warning "G + Y SYS LO PR" will be triggered again.
With RAT extended, the fuel consumption is approximately increased by 1 %.

L1 MIN RAT SPEED ....140 KT

L2 *Note:* *The MIN RAT SPEED ...... 140 kt action line is displayed, if the RAT... MAN ON action line, or the CONSIDER RAT MAN USE action line is displayed.*

L1 AFFECTED PUMPS..OFF
SPD BRK...DO NOT USE

L2 *Due to the loss of one elevator.*

L1 MAX SPEED........................ *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

L2 *Speed is limited in accordance with the slats/flaps configuration.*

L1 MANEUVER WITH CARE

L2 *To avoid high hydraulic demand on the remaining system.*

Note: *As a general rule, do not manually select a HYD ELEC PUMP ON, except temporarily, to retract the spoilers, if they remain out after a hydraulic failure.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

(PROT LOST)
MAX SPEED....................................330/.82

SECONDARY FAILURES

* WHEEL
* F.CTL

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

Ident.: PRO-ABN-HYD-U-00019134.0012001 / 03 NOV 22

L12

STATUS

SPD BRK....................DO NOT USE
MAX SPEED.................... *REFER TO PRO-ABN-F_CTL F/CTL FLAPS/SLATS FAULT/LOCKED*

Speed is limited in accordance with the slats/flaps configuration.

MANEUVER WITH CARE
MIN RAT SPEED (IF RAT EXTENDED)....................140 KT

APPR PROC

- **If system lost by RSVR LO AIR PR:**
  AFFECTED ENG PUMP....................ON
- **If system lost by RSVR OVHT:**
  - **IF GREEN OVHT OUT:**
    GREEN ENG 1 PUMP....................ON
    GREEN ENG 2 PUMP....................ON
  - **IF YELLOW OVHT OUT:**
    YELLOW ENG 2 PUMP....................ON
- **IF HYD NOT RECOVERED:**
  - **BEFORE S/F EXTENSION:**
    - **If ENG 2 S/D:**
      YELLOW ELEC PUMP....................OFF

      Switch OFF the yellow electrical pump to avoid flight control jerk in case Engine 2 is lost.

  GPWS FLAP MODE (IF FLAPS < 3 OR 3 < FLAPS < FULL)....................OFF
  S/F JAMMED PROC....................APPLY
  - **If FLAPS < 3:**
    FOR LDG....................USE FLAP 2

INOP SYS

F/CTL PROT
G + Y HYD
L/G RETRACT
AP 1 + 2
FLAPS
L + R OUTR AIL
R ELEV
MOST SPLRS
N/W STRG
AUTO BRK
NORM BRK
CARGO DOORS (If Y LO LVL.)
CAT 2
REV 2 (1)

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

This line is replaced by "FOR LDG: USE FLAP 2" when CONF 2 is selected, as a reminder.
Selecting FLAP 2, instead of FLAP 3, permits VMAX display on PFD to increase.

- **If FLAPS = 3:**

  FOR LDG.. USE FLAP 3

  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- **If FLAPS > 3:**

  FOR LDG..USE FLAP FULL

  This line is replaced by "FOR LDG: USE FLAP FULL" when CONF FULL is selected, as a reminder.

- **FOR LDG GRVTY EXTN:**

  MAX SPEED... 200 KT
  LDG GRVTY EXTN....................................... DOWN

- **WHEN L/G DOWNLOCKED:**

  L/G LEVER.. DOWN

APPR SPD (IF 1 + F ≤ F< 2)..........................VLS + 5 KT
APPR SPD(IF F ≥ 2) .... VLS + 10 KT

Approach speed increases, due to the loss of one elevator.

LDG DIST PROC...APPLY

FUEL CONSUMPT INCRSD

See (2)

FMS PRED UNRELIABLE

See (3)

ALTN LAW: PROT LOST
CONSIDER RAT MAN USE

See (4)

SLATS SLOW

---

(1) *(If PW/RR engines.)*

Continued on the following page

HYD G + Y SYS LO PR (Cont'd)

(2) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*

(3) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*

(4) *The "CONSIDER RAT MAN USE" status message is not triggered, in the case of a green reservoir overheat, or in the case of a green hydraulic system low level.*

HYD MONITORING FAULT

Applicable to: ALL

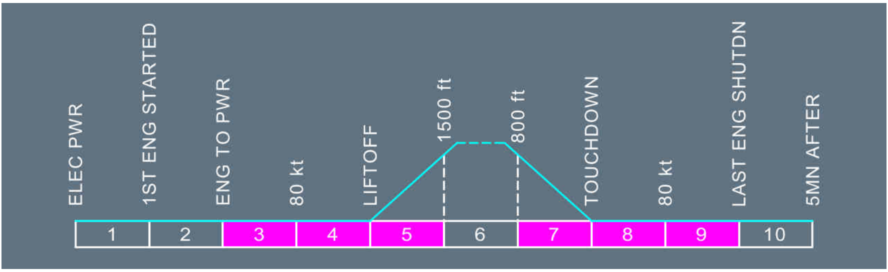
Ident.: PRO-ABN-HYD-S-00017425.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the HSMU is not racked.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

HYD MONITORING FAULT (Cont'd)

Ident.: PRO-ABN-HYD-S-00011400.0001001 / 21 MAR 16

Crew awareness.

L2

Note: *The following functions are lost:*
- *Automatic control of the electrical pumps,*
- *Automatic RAT extension,*
- *Automatic closure of the fire shutoff valves,*
- *OVHT warning on the hydraulic circuit,*
- *Reservoir fluid level on the ECAM.*

Ident.: PRO-ABN-HYD-S-00011401.0001001 / 18 AUG 10

STATUS

INOP SYS

HYD MONG

HYD RAT FAULT
(ON GROUND)

Applicable to: ALL

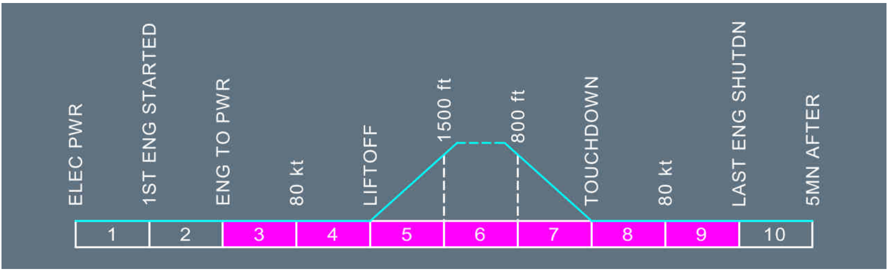
Ident.: PRO-ABN-HYD-R-00017426.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the RAT is not fully stowed and is not running, or stowing pressure is applied.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-HYD-R-00011398.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-HYD-R-00011399.0001001 / 18 AUG 10

STATUS

INOP SYS

RAT

Intentionally left blank

[QRH] LANDING WITH ABNORMAL L/G

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

Ident.: PRO-ABN-LG-K-00019095.0005001 / 17 MAR 17

The procedure is intended for use when nose or main landing gear fail to extend or/and lockdown following the application of L/G GRVTY EXTN procedure.
It is preferable to use any available landing gear rather than carry out a belly landing.
Under these circumstances, a hard surface runway landing is recommended.
Full advantage should be taken of any foam spread on the runway

CAUTION	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible GPWS "TOO LOW GEAR" aural alert.

Ident.: PRO-ABN-LG-K-00019096.0003001 / 05 MAR 19

CABIN CREW .... NOTIFY

Notify the cabin crew of the nature of emergency encountered and state intention. Specify the amount of time available for preparation.

ATC.. NOTIFY

Notify ATC of the nature of emergency and state intentions.

- **If NOSE L/G abnormal:**

  CONSIDER CG AFT SHIFT

  10 pax from front to rear move the CG roughly +2 % aft.

- **If one MAIN L/G abnormal:**

  FUEL DISTRIBUTION.. CONSIDER

  Open all fuel X-FEED valves and switch off the pumps on the side with landing gear normally extended.

OXYGEN CREW SUPPLY.. OFF
SIGNS.. ON
CABIN and COCKPIT (LOOSE EQPT).. PREPARE

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-K-00019097.0005001 / 17 MAR 17

- **For approach:**

  GPWS SYS .... OFF
  L/G lever .... CHECK DOWN
  LDG GEAR GRVTY EXTN .... RESET

  DO NOT ARM AUTOBRAKE

  Manual braking will enable better pitch and roll control. Moreover, with at least one main landing gear in the abnormal position the autobrake cannot be activated (ground spoilers not armed)

  EMER EXIT LT .... ON
  COMMERCIAL .... OFF
  CABIN REPORT .... OBTAIN
  JETTISON ◁✻ .... OFF
  T TANK FEED .... ISOL
  A/SKID & N/W STRG .... OFF

  With one main landing gear not extended, the reference speed used by the anti-skid to detect a wheel blockage is not correctly initialized. As a result, the anti-skid must be switched off to prevent permanent brake release.

  MAX BRAKE PR : 1 000 PSI

  Modulate the brake pressure to 1 000 PSI because the anti-skid is off.

  - **If one or both MAIN L/G abnormal:** DO NOT ARM GROUND SPOILERS

    To keep as much roll authority as possible for maintaining the wings level. Ground spoiler extension would prevent spoilers from acting as roll surfaces.

RAM AIR .... ON

To ensure full depressurization of the aircraft before impact.

- **At 500 ft AGL:**

  BRACE FOR IMPACT .... ORDER

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-K-00019099.0001001 / 17 MAR 17

- **At flare, touchdown and rollout:**

  Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls. Engine pumps continue to supply adequate hydraulic pressure for 30 s after engine shutdown.

  DO NOT USE REVERSE

  Do not use reversers in order to prevent:
  - *The engine(s) from touching the ground during rollout*
  - *Ground spoilers extension, in the case of abnormal main landing gear.*

  - **If NOSE L/G abnormal:**

    KEEP NOSE UP

    After touchdown, keep the nose off the runway by using the elevator. Then, lower the nose onto the runway before elevator control is lost.

    BRAKES.. SMOOTHLY APPLY

    Adapt braking to the efficiency of the elevator.

    BEFORE NOSE IMPACT : ALL ENG MASTERS OFF

    Shut down the engines before nose impact.

  - **If one MAIN L/G abnormal:**

    AT TOUCHDOWN : ALL ENG MASTERS OFF (in sequence)

    After main gear touchdown, shut down the engine on the failure side first, then the other engine before nacelle touchdown.

    KEEP AFFECTED SIDE WING UP

    Use roll control, as needed, to keep unsupported wing up as long as possible.

  - **If both MAIN L/G abnormal:**

    DURING FLARE : ALL ENG MASTERS OFF

    MIN PITCH ATT : 6 °

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-K-00019100.0003001 / 25 APR 17

- **When aircraft stopped:**

  PARK BRK..........ON
  ALL FIRE pb (ENGs & APU)..........PUSH
  ALL AGENT (ENGs & APU)..........DISCH

  - **If evacuation required:**

    EVACUATION..........INITIATE

    Make a short and precise announcement to order the emergency evacuation.
    Press the EVAC COMMAND pb ⊲

    ALL BATs..........OFF

  - **If evacuation not required:**

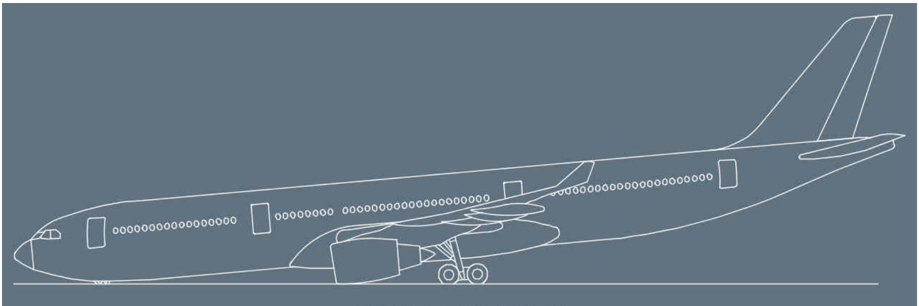
    CABIN CREW and PASSENGERS (PA)..........NOTIFY

    Ensure that all the landing gears are secured before initiating the disembarkation of the aircraft (before switching OFF the SEAT BELT sign).

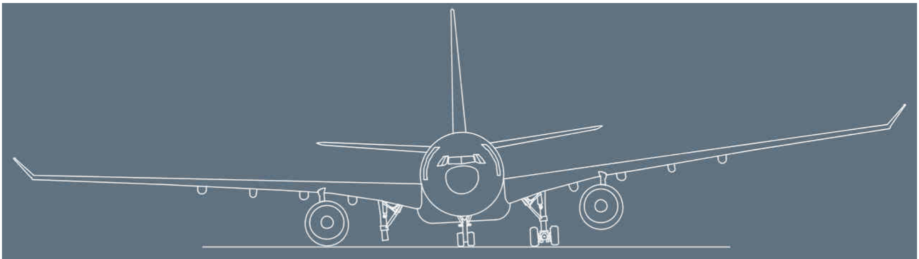
Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

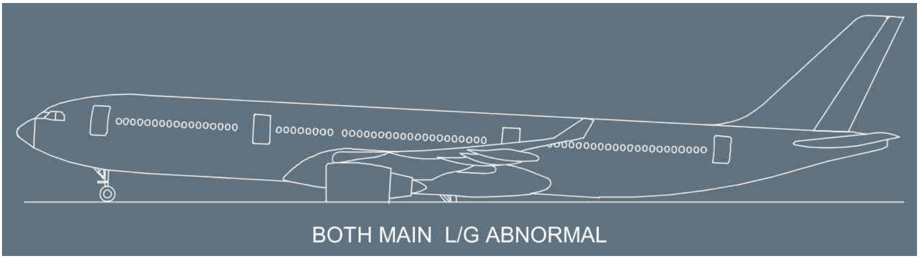
Ident.: PRO-ABN-LG-K-00019125.0001001 / 17 MAR 17



NOSE L/G ABNORMAL



ONE MAIN L/G ABNORMAL



BOTH MAIN L/G ABNORMAL

[QRH] LANDING WITH ABNORMAL L/G

Applicable to: LV-KAN, LV-KAO

Ident.: PRO-ABN-LG-K-00019095.0005001 / 17 MAR 17

The procedure is intended for use when nose or main landing gear fail to extend or/and lockdown following the application of L/G GRVTY EXTN procedure.
It is preferable to use any available landing gear rather than carry out a belly landing.
Under these circumstances, a hard surface runway landing is recommended.
Full advantage should be taken of any foam spread on the runway

CAUTION	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible GPWS "TOO LOW GEAR" aural alert.

Ident.: PRO-ABN-LG-K-00019096.0001001 / 05 MAR 19

CABIN CREW .... NOTIFY

Notify the cabin crew of the nature of emergency encountered and state intention. Specify the amount of time available for preparation.

ATC.. NOTIFY

Notify ATC of the nature of emergency and state intentions.

JETTISON.. CONSIDER

Refer to QRH/ABN-19 Fuel Jettison.

- **If NOSE L/G abnormal:**

  CONSIDER CG AFT SHIFT

  10 pax from front to rear move the CG roughly +2 % aft.

- **If one MAIN L/G abnormal:**

  FUEL DISTRIBUTION.. CONSIDER

  Open all fuel X-FEED valves and switch off the pumps on the side with landing gear normally extended.

OXYGEN CREW SUPPLY.. OFF
SIGNS.. ON
CABIN and COCKPIT (LOOSE EQPT).. PREPARE

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-K-00019097.0005001 / 17 MAR 17

- **For approach:**

  GPWS SYS..OFF
  L/G lever..CHECK DOWN
  LDG GEAR GRVTY EXTN ....RESET

  DO NOT ARM AUTOBRAKE

  Manual braking will enable better pitch and roll control. Moreover, with at least one main landing gear in the abnormal position the autobrake cannot be activated (ground spoilers not armed)

  EMER EXIT LT..ON
  COMMERCIAL..OFF
  CABIN REPORT..OBTAIN
  JETTISON ◁ ....OFF
  T TANK FEED..ISOL
  A/SKID & N/W STRG ....OFF

  With one main landing gear not extended, the reference speed used by the anti-skid to detect a wheel blockage is not correctly initialized. As a result, the anti-skid must be switched off to prevent permanent brake release.

  MAX BRAKE PR : 1 000 PSI

  Modulate the brake pressure to 1 000 PSI because the anti-skid is off.

  - **If one or both MAIN L/G abnormal:** DO NOT ARM GROUND SPOILERS

    To keep as much roll authority as possible for maintaining the wings level. Ground spoiler extension would prevent spoilers from acting as roll surfaces.

RAM AIR ....ON

To ensure full depressurization of the aircraft before impact.

- **At 500 ft AGL:**

  BRACE FOR IMPACT..ORDER

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-K-00019099.0001001 / 17 MAR 17

- **At flare, touchdown and rollout:**

  Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls. Engine pumps continue to supply adequate hydraulic pressure for 30 s after engine shutdown.

  DO NOT USE REVERSE

  Do not use reversers in order to prevent:
  - *The engine(s) from touching the ground during rollout*
  - *Ground spoilers extension, in the case of abnormal main landing gear.*

  - **If NOSE L/G abnormal:**

    KEEP NOSE UP

    After touchdown, keep the nose off the runway by using the elevator. Then, lower the nose onto the runway before elevator control is lost.

    BRAKES.. SMOOTHLY APPLY

    Adapt braking to the efficiency of the elevator.

    BEFORE NOSE IMPACT : ALL ENG MASTERS OFF

    Shut down the engines before nose impact.

  - **If one MAIN L/G abnormal:**

    AT TOUCHDOWN : ALL ENG MASTERS OFF (in sequence)

    After main gear touchdown, shut down the engine on the failure side first, then the other engine before nacelle touchdown.

    KEEP AFFECTED SIDE WING UP

    Use roll control, as needed, to keep unsupported wing up as long as possible.

  - **If both MAIN L/G abnormal:**

    DURING FLARE : ALL ENG MASTERS OFF

    MIN PITCH ATT : 6 °

Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

Ident.: PRO-ABN-LG-K-00019100.0003001 / 25 APR 17

- **When aircraft stopped:**

  PARK BRK .... ON
  ALL FIRE pb (ENGs & APU) .... PUSH
  ALL AGENT (ENGs & APU) .... DISCH

  - **If evacuation required:**

    EVACUATION .... INITIATE

    Make a short and precise announcement to order the emergency evacuation.
    Press the EVAC COMMAND pb ◁

    ALL BATs .... OFF

  - **If evacuation not required:**

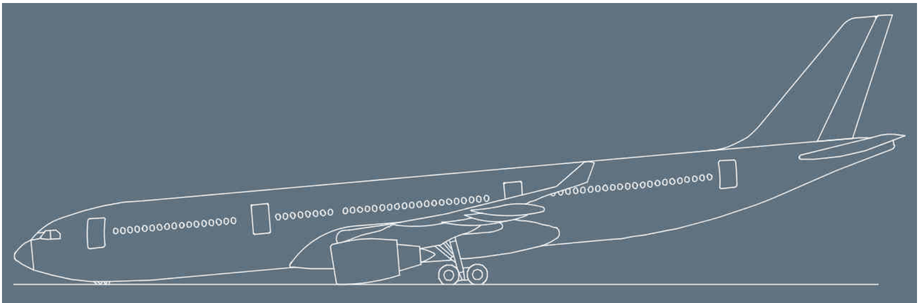
    CABIN CREW and PASSENGERS (PA) .... NOTIFY

    Ensure that all the landing gears are secured before initiating the disembarkation of the aircraft (before switching OFF the SEAT BELT sign).

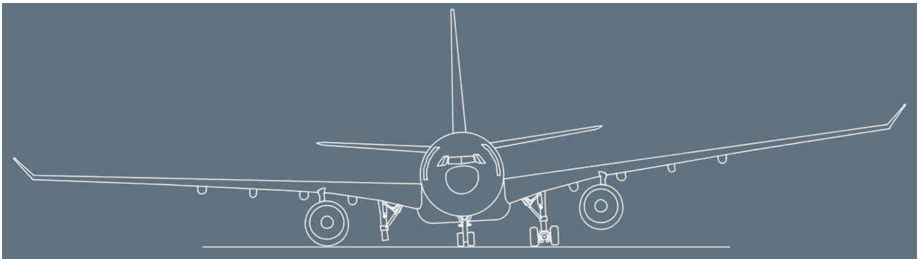
Continued on the following page

[QRH] LANDING WITH ABNORMAL L/G (Cont'd)

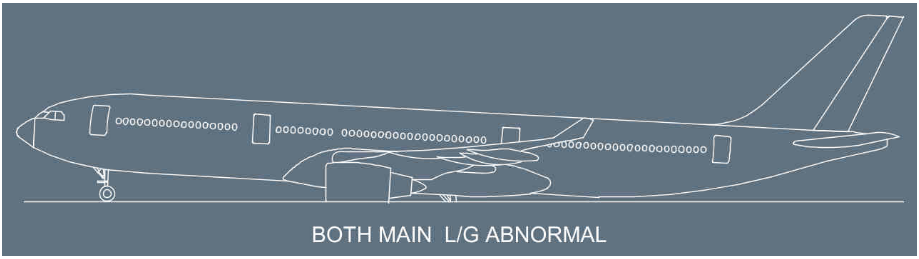
Ident.: PRO-ABN-LG-K-00019125.0001001 / 17 MAR 17



NOSE L/G ABNORMAL



ONE MAIN L/G ABNORMAL



BOTH MAIN L/G ABNORMAL

[QRH] L/G GRAVITY EXTENSION

Ident.: PRO-ABN-LG-00015204.0001001 / 12 MAY 23
Applicable to: ALL

CAUTION	Do not apply this procedure if at least one green triangle is displayed on each landing gear on the WHEEL SD page. This is sufficient to confirm that the landing gear is downlocked. Disregard any possible GPWS "TOO LOW GEAR" aural alert.

MAX SPEED....................200 KT

Speed with main landing gear doors open is limited to 200 kt to avoid vibrations transmitted through the cabin floor.

LDG GRVTY EXTN....................DOWN

● **When L/G DOWNLOCKED**

L/G lever....................DOWN

The landing gear lever should be confirmed in the DOWN position for the following reasons:
- *To extinguish the UNLK lights on landing gear indications panel.*
- *To prevent the L/G CTL message on WHEEL SD page and the L/G GEAR NOT DOWN alert on the ECAM.*
- *To minimize the risk of landing gear retraction on the ground, due to unknown system fault, when the freefall system is reset.*

GEAR DOWN indications....................CHECK

N/W STEERING NOT AVAILABLE

L/G DOORS REMAIN OPEN

■ **If successful:**

DO NOT RESET LDG GEAR GRVTY EXTN

The freefall system should not be reset to avoid undesirable effect such as further fluid loss in the event of a leak or possible landing gear unlocking in the event of a gear selector valve jammed in UP position.

Note: *Following the use of the freefall system for training purposes in flight, the system can be reset in flight. Provided that the green hydraulic system is available, a reset of the freefall system enables closure of the landing gear doors.*

■ **If unsuccessful:**

LDG WITH ABNORMAL L/G PROC....................APPLY

Refer to QRH/ABN-21 Landing with Abnormal L/G

Continued on the following page

[QRH] L/G GRAVITY EXTENSION (Cont'd)

Note: 1. *One gravity extension reset is allowed in case of L/G GEAR NOT DOWNLOCKED alert display.*
2. *In all cases the freefall system should not be reset by flight crew on the ground following freefall extension.*

NWS OVERSTEER

Ident.: PRO-ABN-LG-00019417.0001001 / 21 MAR 16
Applicable to: ALL

Maintenance action is due, when the NWS TOWING FAULT light comes on.

L/G DOORS NOT CLOSED

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

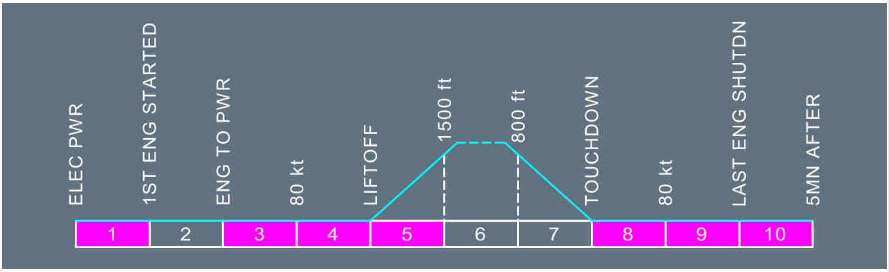
Ident.: PRO-ABN-LG-H-00018134.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one or more gear door(s) is not uplocked.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

L/G DOORS NOT CLOSED (Cont'd)

Ident.: PRO-ABN-LG-H-00018690.0010001 / 01 OCT 19

MAX SPEED......250/.55

- **If L/G lever is UP :**
  - **WHEN SPD < 250/.55 :**

    L/G......RECYCLE

L2 *Note:* *To recycle the landing gear, the flight crew must perform the following actions:*
- *Move the landing gear lever down*
- *Wait for the landing gear to downlock and for the landing gear doors to close. Simultaneously monitor the WHEEL page on the System Display (SD)*
- *Move the landing gear lever up.*

The active LGCIU changes when the landing gear is recycled.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 *Note:* *These messages are inhibited in the case of all engines flame out.*

Ident.: PRO-ABN-LG-H-00010775.0002001 / 23 AUG 13

L12

STATUS

	INOP SYS
MAX SPEED......250/.55	L/G DOOR
FUEL CONSUMPT INCRSD *See* (1)	
FMS PRED UNRELIABLE *See* (2)	

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*
This message is inhibited in case of all engines flame out.

L/G DOORS NOT CLOSED

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

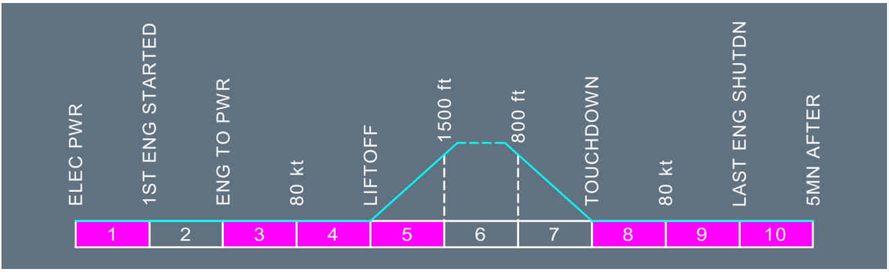
Ident.: PRO-ABN-LG-H-00018134.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one or more gear door(s) is not uplocked.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-H-00018690.0006001 / 21 MAR 16

MAX SPEED..250/.55

- **If L/G lever is UP :**
  - **WHEN SPD < 250/.55 :**

    L/G LEVER..RECYCLE

L2 *Note:* *To recycle the landing gear, the flight crew must perform the following actions:*
- *Move the landing gear lever down*
- *Wait for the landing gear to downlock and for the landing gear doors to close. Simultaneously monitor the WHEEL page on the System Display (SD)*
- *Move the landing gear lever up.*

The active LGCIU changes when the landing gear is recycled.

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 *Note:* *These messages are inhibited in the case of all engines flame out.*

Continued on the following page

L/G DOORS NOT CLOSED (Cont'd)

Ident.: PRO-ABN-LG-H-00010775.0002001 / 23 AUG 13

L12

STATUS

	INOP SYS
MAX SPEED... 250/.55	L/G DOOR
FUEL CONSUMPT INCRSD *See* (1) FMS PRED UNRELIABLE *See* (2)	

---

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*
This message is inhibited in case of all engines flame out.

L/G GEAR NOT DOWN

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

Ident.: PRO-ABN-LG-AD-00018137.0002001 / 08 NOV 22

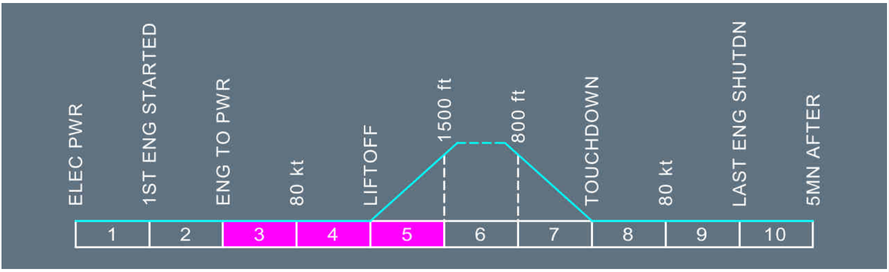
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Landing gear not downlocked, radio height is below 750 ft, all engines not at TO power, and flaps at 2 or 3, or
- Landing gear not downlocked, radio height is below 750 ft, and flaps at FULL, or
- Landing gear not downlocked, flaps at 3 or FULL, both radio altimeters are failed, and all engines not at TO power, or
- Landing gear not downlocked, flaps at 3 or FULL, no height data computed from both radio altimeters, and engines not at TO power.
  Above 5 500 ft the data from the RAs are not available. The selection of FLAPS 3 or FULL above 5 500 ft may trigger the L/G GEAR NOT DOWN alert.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-AD-00018879.0001001 / 21 MAR 16

L2 This warning is associated with the illumination of the red arrow on the instrument panel.

L1 Crew awareness.

L/G GEAR NOT DOWN

Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

Ident.: PRO-ABN-LG-AD-00018137.0001001 / 08 NOV 22

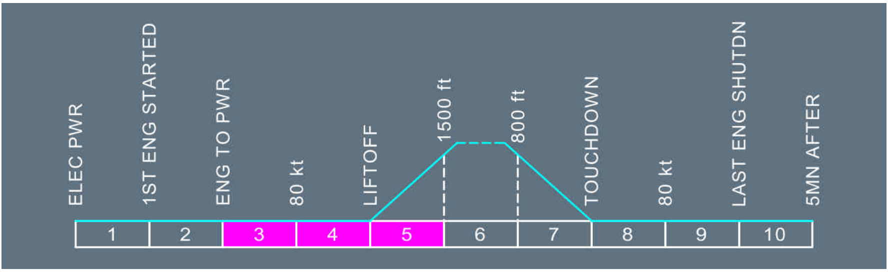
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Landing gear not downlocked, radio height is below 750 ft, all engines not at TO power, and flaps at 2 or 3, or
- Landing gear not downlocked, radio height is below 750 ft, and flaps at FULL, or
- Landing gear not downlocked, flaps at 3 or FULL, both radio altimeters are failed, and all engines not at TO power, or
- Landing gear not downlocked, flaps at 3 or FULL, no height data computed from both radio altimeters, and engines not at TO power.
  Above 7 500 ft the data from the RAs are not available. The selection of FLAPS 3 or FULL above 7 500 ft may trigger the L/G GEAR NOT DOWN alert.

Flight Phase Inhibition:



Ident.: PRO-ABN-LG-AD-00018879.0001001 / 21 MAR 16

L2 This warning is associated with the illumination of the red arrow on the instrument panel.

L1 Crew awareness.

L/G GEAR NOT DOWNLOCKED

Applicable to: ALL

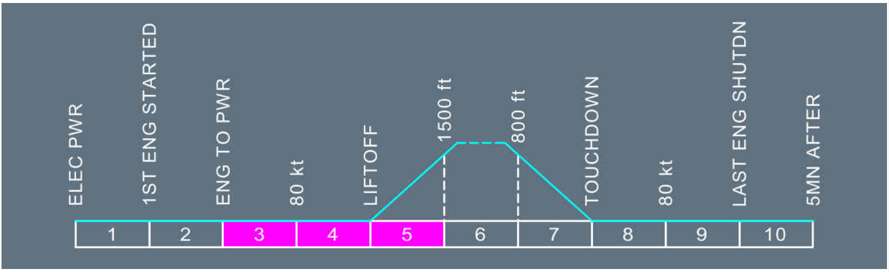
Ident.: PRO-ABN-LG-E-00018136.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one or more gear(s) are not downlocked and the landing gear is selected down.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

L/G GEAR NOT DOWNLOCKED (Cont'd)

Ident.: PRO-ABN-LG-E-00018694.0006001 / 21 MAR 16

L/G lever.. RECYCLE

L2 *Note: For recycling, select landing gear UP, wait for landing gear uplock, then select landing gear lever down again. The active LGCIU changes when the landing gear is recycled.*

L1
- **IF UNSUCCESSFUL AFTER 120 S AND FOR L/G GRVTY EXTN :**
  MAX SPEED.. 200 KT
  LDG GRVTY EXTN.. DOWN
- **IF WARNING AFTER 40 S :**
  LDG GRVTY EXTN..RESET
  L/G lever...UP
- **FOR L/G GRVTY EXTN :**
  MAX SPEED.. 200 KT
  LDG GRVTY EXTN.. DOWN
- **WHEN L/G DOWNLOCKED :**
  L/G lever... DOWN

Ident.: PRO-ABN-LG-E-00010767.0001001 / 21 MAR 16

L12

STATUS

APPR PROC	INOP SYS
● **FOR L/G GRVTY EXTN :** MAX SPEED........................ 200 KT L/G GRVTY EXTN................ DOWN ● **WHEN L/G DOWNLOCKED :** L/G LEVER........................DOWN *If the second gravity extension is unsuccessful, Refer to PRO-ABN-LG [QRH] LANDING with Abnormal L/G.* CAT 3 SINGLE ONLY	CAT 3 DUAL N/W STRG (1)

(1) *(As nose gear doors remain open, the hydraulic power for nose wheel steering is lost.)*

L/G GEAR NOT UPLOCKED
(L/G DOORS CLOSED)

Applicable to: ALL

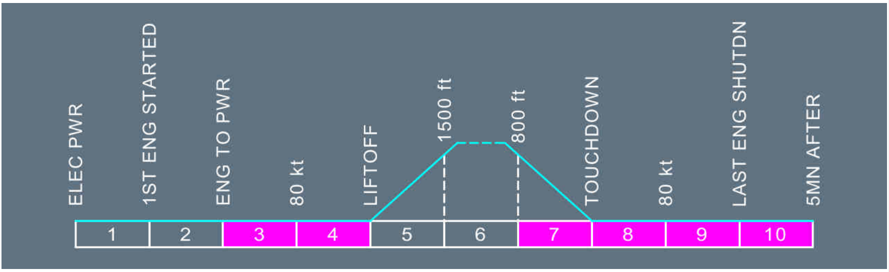
Ident.: PRO-ABN-LG-A-00018138.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one or more gear(s) are not uplocked and the landing gear is not selected down.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-A-00018696.0002001 / 21 MAR 16

AVOID EXCESS G FACTOR

L2 *Since the gear rests on the doors, avoid excessive load factors in order not to damage the door structure.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 *Note:* *These messages are inhibited in the case of all engines flame out.*

Continued on the following page

L/G GEAR NOT UPLOCKED (Cont'd)
(L/G DOORS CLOSED)

Ident.: PRO-ABN-LG-A-00010760.0002001 / 23 AUG 13

L12

STATUS

AVOID EXCESS G FACTOR

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

---

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *Disregard FMS fuel predictions and Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor.*
This message is inhibited in case of all engines flame out.

L/G GEAR NOT UPLOCKED
(L/G DOORS NOT CLOSED)

Applicable to: ALL

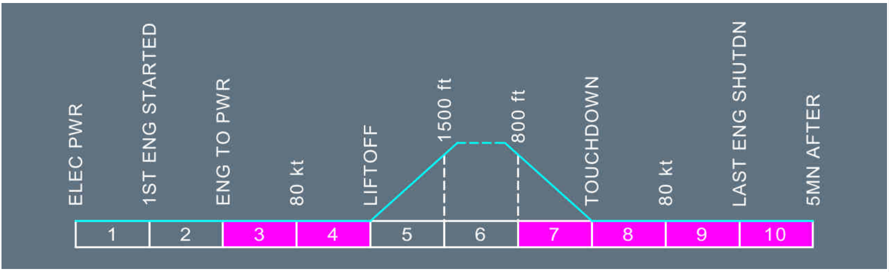
Ident.: PRO-ABN-LG-B-00018139.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one or more gear(s) not uplocked and the landing gear is not selected down.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-B-00018699.0002001 / 21 MAR 16

MAX SPEED........250/0.55

- **WHEN SPD < 250/0.55:**

  L/G........RECYCLE

L2 *Note: For recycling, select landing gear DOWN, wait for landing gear downlock, then select landing gear up again. The active LGCIU changes when the landing gear is recycled.*

L1
- **IF UNSUCCESSFUL:**

  L/G LEVER........DOWN

  MAX SPEED........250/0.55

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 *Note: These messages are inhibited in the case of all engines flame out.*

Continued on the following page

L/G GEAR NOT UPLOCKED (Cont'd)
(L/G DOORS NOT CLOSED)

Ident.: PRO-ABN-LG-B-00010762.0002001 / 17 NOV 20

L12

STATUS

	INOP SYS
MAX SPEED... 250/.55	L/G RETRACT
FUEL CONSUMPT INCRSD *See* (1)	
FMS PRED UNRELIABLE *See* (2)	

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *If the flight is continued (to destination or to alternate) with landing gear extended:*
- *Disregard FMS fuel predictions.* Refer to QRH/OPS - Fuel Penalty Factors / ECAM Alert Tables *in order to find the applicable Fuel Penalty Factor*
- *Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise*
- *Do not use the managed speed mode (except in approach)*
- *Do not use the CLB and the DES autopilot modes.*

This message is inhibited in case of all engines flame out.

L/G GEAR UPLOCK FAULT

Applicable to: ALL

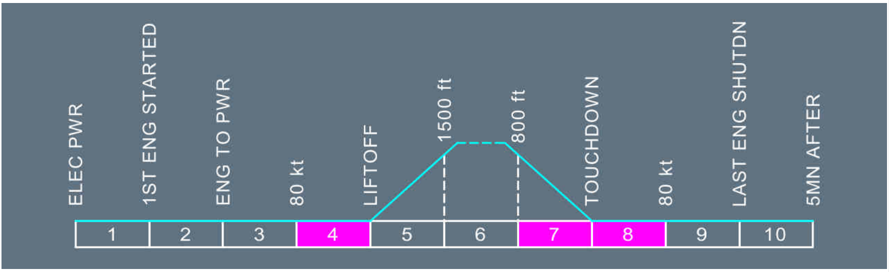
Ident.: PRO-ABN-LG-D-00018140.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one gear uplock is engaged and the corresponding gear is downlocked.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-D-00010763.0002001 / 23 AUG 13

MAX SPEED....................250/.55
L/G LEVER....................KEEP DOWN

L2 *Landing gear must be left down to avoid structural damage, as the uplock device will stay in the locked position.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 *Note:* *These messages are inhibited in case of all engines flame out.*

Continued on the following page

L/G GEAR UPLOCK FAULT (Cont'd)

Ident.: PRO-ABN-LG-D-00010765.0002001 / 17 NOV 20

L12

STATUS

MAX SPEED... 250/.55
L/G LEVER.. KEEP DOWN

FUEL CONSUMPT INCRSD
See (1)
FMS PRED UNRELIABLE
See (2)

INOP SYS

L/G RETRACT

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *If the flight is continued (to destination or to alternate) with landing gear extended:*

- *Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor*
- *Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise*
- *Do not use the managed speed mode (except in approach)*
- *Do not use the CLB and the DES autopilot modes*

This message is inhibited in case of all engines flame out.

L/G L (R) LENGTHENING FAULT

Applicable to: ALL

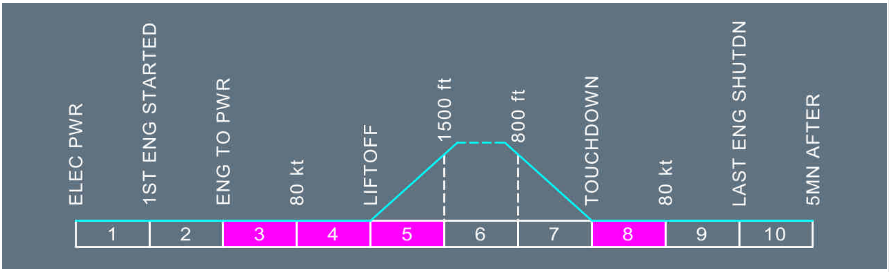
Ident.: PRO-ABN-LG-G-00018141.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both LGCIUs detect that a Main Landing Gear (MLG) shortening mechanism is not downlocked when the same MLG is downlocked.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-G-00010771.0002001 / 23 AUG 13

MAX SPEED....................250/.55
L/G LEVER....................KEEP DOWN

L2 *Note: The shock absorber performance of the affected gear is degraded. Touchdown as smoothly as possible.*

L1 FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 *Note: These messages are inhibited in case of all engines flame out.*

Continued on the following page

L/G L (R) LENGTHENING FAULT (Cont'd)

Ident.: PRO-ABN-LG-G-00010772.0002001 / 17 NOV 20

L12

STATUS

MAX SPEED.. 250/.55
L/G LEVER... KEEP DOWN

FUEL CONSUMPT INCRSD

See (1)

FMS PRED UNRELIABLE

See (2)

INOP SYS

L/G RETRACT

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *If the flight is continued (to destination or to alternate) with landing gear extended:*

- *Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor*
- *Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise*
- *Do not use the managed speed mode (except in approach)*
- *Do not use the CLB and the DES autopilot modes*

This message is inhibited in case of all engines flame out.

L/G LGCIU 1(2) FAULT

Applicable to: ALL

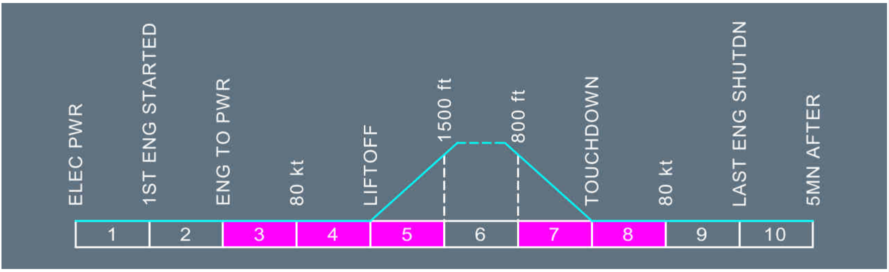
Ident.: PRO-ABN-LG-I-00018142.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when LGCIU 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-I-00010777.0002001 / 18 MAR 11

GPWS SYS (IF LGCIU 1 AFFECTED)....................OFF

L2 *As LGCIU 1 is lost, GPWS receives "landing gear in up position" information even if landing gear is down. Setting GPWS SYS pb-sw to OFF, will prevent untimely warnings in approach.*

Ident.: PRO-ABN-LG-I-00010778.0001001 / 05 MAY 22

L12

STATUS

	INOP SYS
LDMCR ◁ If LGCIU 2 is inoperative, the heating of the lower deck cabin crew rest compartment is lost.	LGCIU 1(2) GPWS (1)

---

(1) *(When GPWS is set to OFF)*

L/G LGCIU 1+2 FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

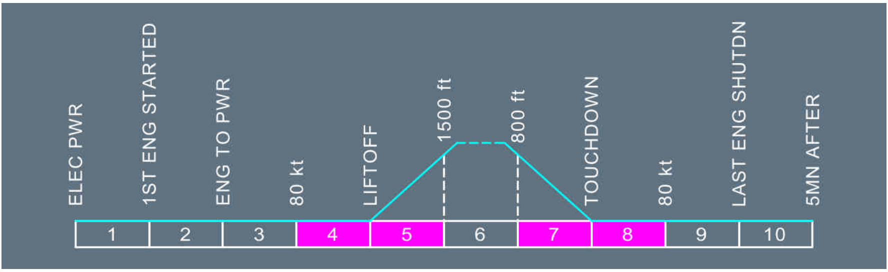
Ident.: PRO-ABN-LG-J-00018143.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both LGCIUs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-J-00018700.0004001 / 21 MAR 16

GPWS SYS.. OFF

L2 *As LGCIU 1 is lost, GPWS receives "landing gear in up position" information even if landing gear is down. Setting GPWS SYS pb-sw to OFF, will prevent untimely warnings in approach.*

L1
- **FOR L/G EXTN:**
  L/G NORMAL EXTN...TRY
- **IF UNSUCCESSFUL:**
  L/G GRVTY EXTN ONLY

L2 *Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION*

L1
  - **FOR L/G GRVTY EXTN:**
    MAX SPEED...200 KT

Continued on the following page

L/G LGCIU 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-LG-J-00010780.0007001 / 05 MAY 22

L12

STATUS

APPR PROC

- **FOR L/G EXTN:**
  L/G NORMAL EXTN..........TRY
- **IF UNSUCCESSFUL:**
  L/G GRVTY EXTN ONLY
  - **FOR L/G GRVTY EXTN:**
    MAX SPEED..........200 KT

LDG DIST PROC..........APPLY

CAT 3 SINGLE ONLY
ENG HI IDLE
See (2)

INOP SYS

LGCIU 1+2
REVERSERS
CAT 3 DUAL
N/W STRG
GPWS (1)

Note: Partial spoiler extension at landing, when only one main landing gear is compressed, is not available. Spoilers extend normally on ground, when the wheel speed is greater than 72 kt.

(1) *(When GPWS is set to OFF)*
(2) *When idle is selected on the ground, only the approach idle is available.*

L/G LGCIU 1+2 FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

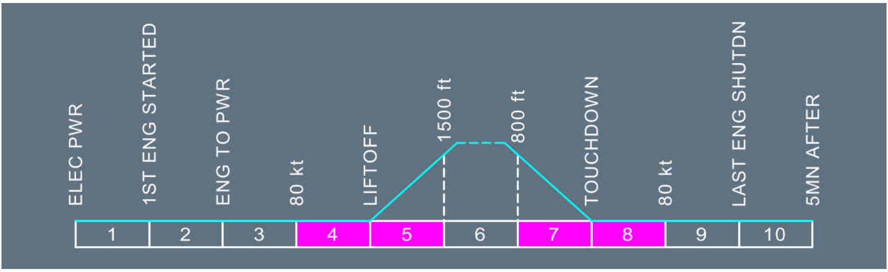
Ident.: PRO-ABN-LG-J-00018143.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both LGCIUs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-J-00018700.0004001 / 21 MAR 16

GPWS SYS.. OFF

L2 *As LGCIU 1 is lost, GPWS receives "landing gear in up position" information even if landing gear is down. Setting GPWS SYS pb-sw to OFF, will prevent untimely warnings in approach.*

L1
- **FOR L/G EXTN:**

  L/G NORMAL EXTN...TRY

- **IF UNSUCCESSFUL:**

  L/G GRVTY EXTN ONLY

L2 *Refer to PRO-ABN-LG [QRH] L/G GRAVITY EXTENSION*

L1
  - **FOR L/G GRVTY EXTN:**

    MAX SPEED..200 KT

Continued on the following page

L/G LGCIU 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-LG-J-00010780.0001001 / 05 MAY 22

L12

STATUS

APPR PROC

- **FOR L/G EXTN:**
  L/G NORMAL EXTN...TRY
- **IF UNSUCCESSFUL:**
  L/G GRVTY EXTN ONLY
  - **FOR L/G GRVTY EXTN:**
    MAX SPEED ....200 KT

ENG HI IDLE
See (2)
CAT 3 SINGLE ONLY

INOP SYS

LGCIU 1+2
REVERSERS
N/W STRG
GPWS (1)
CAT 3 DUAL

Note: Partial spoiler extension at landing, when only one main landing gear is compressed, is not available. Spoilers extend normally on ground, when the wheel speed is higher than 72 kt.

(1) *(When GPWS is set to OFF)*
(2) *When idle is selected on the ground, only the approach idle is available.*

L/G RETRACTION FAULT

Applicable to: ALL

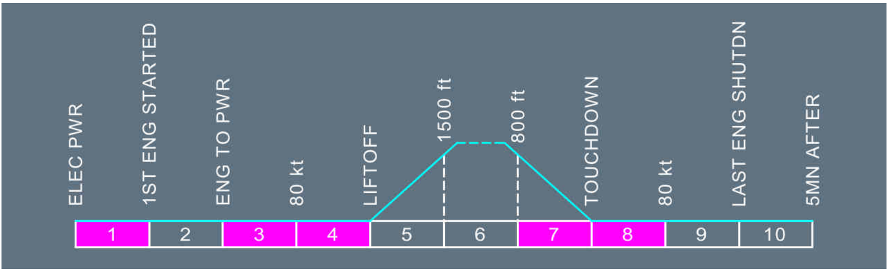
Ident.: PRO-ABN-LG-F-00018144.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the landing gear is selected up and:
- The bogie beam is not in the correct position, or
- The pitch trimmer is not in the correct position, or
- The nose or center landing gear shock absorber is not in the correct position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-F-00010769.0002001 / 30 JUN 14

MAX SPEED....................250/.55
L/G....................RECYCLE

L2 Note: *For recycling, select landing gear DOWN, wait for landing gear downlock, then select landing gear lever up again. The active LGCIU changes when the landing gear is recycled.*

L1 ● **IF UNSUCCESSFUL :**
L/G....................KEEP DOWN

FUEL CONSUMPT INCRSD
FMS PRED UNRELIABLE

L2 Note: *These messages are inhibited in case of all engines flame out.*

Continued on the following page

L/G RETRACTION FAULT (Cont'd)

Ident.: PRO-ABN-LG-F-00010770.0002001 / 17 NOV 20

L12

STATUS

MAX SPEED.. 250/.55
L/G LEVER... KEEP DOWN

FUEL CONSUMPT INCRSD
See (1)
FMS PRED UNRELIABLE
See (2)

INOP SYS

L/G RETRACT

(1) *This message is triggered when the failure (or combination of failures) affects the nominal aerodynamic characteristics of the aircraft.*
This message is inhibited in case of all engines flame out.

(2) *If the flight is continued (to destination or to alternate) with landing gear extended:*
- *Disregard FMS fuel predictions. Refer to QRH/OPS Fuel Penalty Factors/ECAM Alert Table in order to find the applicable Fuel Penalty Factor*
- *Disregard FMS altitude and speed predictions. Time predictions are only valid in cruise*
- *Do not use the managed speed mode (except in approach)*
- *Do not use the CLB and the DES autopilot modes*

This message is inhibited in case of all engines flame out.

L/G SYS DISAGREE

Applicable to: ALL

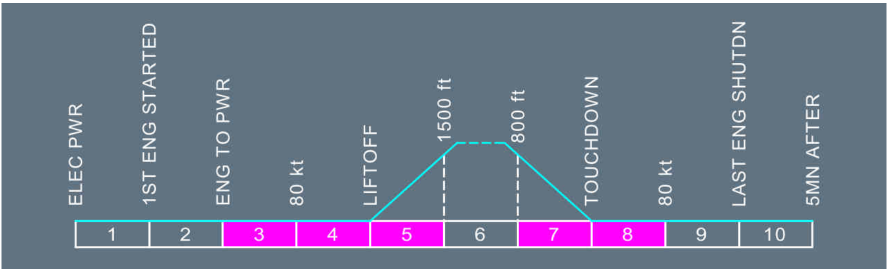
Ident.: PRO-ABN-LG-AE-00018145.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the landing gear positions provided by both LGCIUs are different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-LG-AE-00018704.0001001 / 21 MAR 16

L2 When the landing gear lever is down, check that at least one green triangle is displayed on each landing gear on the WHEEL SD page. This confirms that the landing gear is downlocked. Rely also on the "LDG GEAR DN" green LDG MEMO message to confirm that the landing gear is downlocked.
The GPWS "TOO LOW GEAR" aural alert could be therefore wrongly triggered during the approach.

L1 Crew awareness.

Intentionally left blank

[MEM] EMER DESCENT

Ident.: PRO-ABN-MISC-00012261.0001001 / 20 MAR 17
Applicable to: ALL

CREW OXY MASKS.......USE
SIGNS.......ON
EMER DESCENT.......INITIATE

- **If A/THR not active:**
  THR LEVERS.......IDLE

SPD BRK.......FULL

- **When descent established:**
  SPEED.......MAX/APPROPRIATE
  - **If structural damage suspected :** MANEUVER WITH CARE

  CONSIDER L/G EXTENSION

  Landing gear may be extended. In such a case, speed must be reduced to VLO/VLE.

  ENG START SEL.......IGN
  ATC.......NOTIFY

  Notify ATC of the nature of the emergency, and state intention. The flight crew can communicate with the ATC using voice, or CPDLC when the voice contact cannot be established or has poor quality.

  EMER DESCENT (PA).......ANNOUNCE

  The flight crew must inform the cabin of emergency descent on the PA system.

  ATC XPDR 7700.......CONSIDER

  Squawk 7700 unless otherwise specified by ATC.

  CREW OXY MASKS DILUTION.......NORM

  - *To save oxygen, set the oxygen diluter selector to the N position*
  - *If the oxygen diluter selector remains set to 100 %, oxygen quantity may be insufficient to cover the entire emergency descent profile*
  - *Ensure that crew communication is established with oxygen masks. Avoid the continuous use of the interphone to minimize interference with the breathing noise in the oxygen mask.*

  MAX FL : 100 / MEA - MORA

  - **If CAB ALT above 14 000 ft:**
    OXYGEN PAX MASK MAN ON.......PRESS

    This action confirms that the passenger oxygen masks are released.

Continued on the following page

[MEM] EMER DESCENT (Cont'd)

Note: *Notify the cabin crew, when the aircraft reaches a safe flight level, and when cabin oxygen is no more necessary.*

[MEM] STALL RECOVERY

Ident.: PRO-ABN-MISC-00013664.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

As soon as any stall indication (could be aural warning, buffet...) is recognized, apply the immediate actions:

NOSE DOWN PITCH CONTROL....................APPLY

This will reduce angle of attack

Note: *In case of lack of pitch down authority, reducing thrust may be necessary.*

BANK....................WINGS LEVEL

- **When out of stall (no longer stall indications) :**

  THRUST....................INCREASE SMOOTHLY AS NEEDED

  Note: *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

  SPEEDBRAKES....................CHECK RETRACTED
  FLIGHT PATH....................RECOVER SMOOTHLY

  - **If in clean configuration and below 20 000 ft :**

    FLAP1....................SELECT

    Note: *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

[MEM] STALL RECOVERY

Ident.: PRO-ABN-MISC-00013664.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

As soon as any stall indication (could be aural warning, "STALL STALL" red message on PFD, buffet...) is recognized, apply the immediate actions:

NOSE DOWN PITCH CONTROL..APPLY

This will reduce angle of attack

Note: *In case of lack of pitch down authority, reducing thrust may be necessary.*

BANK..WINGS LEVEL

- **When out of stall (no longer stall indications) :**

  THRUST..INCREASE SMOOTHLY AS NEEDED

  Note: *In case of one engine inoperative, progressively compensate the thrust asymmetry with rudder.*

  SPEEDBRAKES..CHECK RETRACTED
  FLIGHT PATH..RECOVER SMOOTHLY

  - **If in clean configuration and below 20 000 ft :**

    FLAP1..SELECT

    Note: *If a risk of ground contact exists, once clearly out of stall (no longer stall indications), establish smoothly a positive climb gradient.*

[MEM] STALL WARNING AT LIFTOFF

Ident.: PRO-ABN-MISC-00013665.0002001 / 10 MAY 21
Applicable to: ALL

If stall warnings trigger at liftoff, apply the following immediate actions:

THRUST..TOGA

At the same time:

PITCH ATTITUDE..15 °
BANK..WINGS LEVEL

[QRH] BOMB ON BOARD

Ident.: PRO-ABN-MISC-00012264.0003001 / 05 MAY 22
Applicable to: ALL

COCKPIT PROCEDURES

BACKGROUND

To avoid the activation of an altitude-sensitive bomb, the cabin altitude should not exceed the value at which the bomb has been discovered.
To reduce the effects of the explosion, the aircraft should fly as long as possible with approximately 1 PSI differential pressure, to help the blast go outwards. 1 PSI differential pressure corresponds to a 2 500 ft difference between the aircraft and the cabin altitude.
These conditions are achieved by using the manual pressure control.

PROCEDURE

The following procedure assumes that it is initiated during climb or cruise:

First, maintain the cabin altitude using manual pressure mode.
While maintaining the cabin altitude, descend the aircraft to the cabin altitude + 2 500 ft and maintain delta P at 1 PSI.
During further steps of descent, maintain delta P at 1 PSI using the cabin V/S target selector.
During the approach, use automatic pressure mode in order to reduce the differential pressure to zero at touchdown.

If flight conditions are different, the crew should adapt the procedure, bearing in mind the above-mentioned principles (background paragraph).

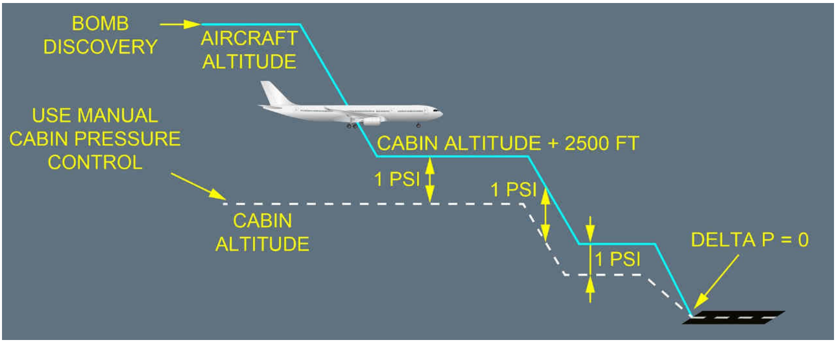
CKPT/CAB COM..ESTABLISH

■ **If landing and evacuation possible within 30 min:**
  ATC/COMPANY.. NOTIFY
  EVAC...PREPARE

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

■ If landing and evacuation NOT possible within 30 min:



AIRCRAFT (IF CLIMBING)..LEVEL OFF

CABIN PRESS MODE SEL..MAN

L2 *The purpose is to immediately prevent the cabin altitude from increasing, in order to avoid the activation of an altitude-sensitive bomb.*

L1 MAINTAIN CAB ALT

L2 *Use MAN V/S CTL sw to maintain the cabin altitude at the value it had when the bomb was discovered.*

L1 ATC/COMPANY..NOTIFY

L2 *To obtain expert advice from explosive specialists.*

L1 TRGT SPEED : PREFER LO IAS

Low speed could reduce the consequences of possible structural damage, if the bomb explodes.

DESCENT TO CAB ALT + 2 500 ft or MEA - MORA..INITIATE

L2 *Descending to 2 500 ft above the cabin altitude gives a cabin differential pressure of approximately 1 PSI, which helps to ensure that the blast goes outwards, if the bomb explodes.*

L1 AVOID SHARP MANEUVERS

L2 *Which might result in the bomb moving.*

L1 MAINTAIN CAB ALT

L2 *Use MAN V/S CTL sw to maintain the cabin altitude. Initially brief UP input should be required; but, be careful not to increase the cabin altitude.*

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

L1 ● **When at CAB ALT + 2 500 ft:**

MAINTAIN 1 PSI ΔP

L2 *Use MAN V/S CTL sw to adjust delta P to 1 PSI. Brief DN input should be initially required to set 0 ft/min cabin vertical speed.*

L1 GALLEY....................OFF

FUEL RESERVES....................DETERMINE

When flying at cabin altitude + 2 500 ft, the fuel consumption in CONF 1, with landing gear down, is about 2.1 times that consumed in clean configuration.

● **When bomb secured at the LRBL or cannot be moved:**

Least Risk Bomb Location (LRBL) is the center of the RH aft cabin door.

EMER EXIT LT....................ON

L2 *To recover minimum cabin lighting when the COMMERCIAL pb is OFF*

L1 COMMERCIAL....................OFF

● **If fuel permits:**

FLAPS....................AT LEAST CONF 1

L/G lever (except for flight over water)....................DOWN

L2 *The detonation could damage the landing systems. Therefore, if fuel permits, configure the aircraft for landing as soon as possible. Reducing the speed will minimize stress on the aircraft structure.*

L1 USE NORMAL CONF FOR LANDING

DURING FURTHER DESCENT: MAINTAIN MAX 1 PSI ΔP

L2 *Use MAN V/S CTL sw to DN to adjust delta P to 1 PSI.*

L1 ● **During approach:**

CABIN PRESS MODE SEL....................AUTO

L2 *This allows CPC to automatically control the cabin altitude to 0 during final approach.*

L1 ● **When aircraft on ground and stopped in a remote area (if possible):**

Refer to QRH/ABN-22 EMER EVAC.

CABIN PROCEDURES

If a suspect device is found in the cabin:

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

WARNING	Do not cut or disconnect any wires and do not open or attempt to gain entry to internal components of a closed or concealed suspect device. Any attempt may result in an explosion. Booby-trapped closed devices have been used on aircraft in the past.

WARNING	Alternate locations must not be used without consulting with an aviation explosives security specialist. Never take a suspect device to the flight deck.

CAUTION	The least risk bomb location for the aircraft structure and systems is center of the RH aft cabin door.

EOD PERSONNEL ON BOARD....................CHECK

L2 *Announce: “Is there any EOD personnel on board ?”. By using the initials, only persons familiar with EOD (Explosive Ordnance Disposal) will be made aware of the problem.*

L1 DO NOT OPEN THE BOMB
DO NOT CUT BOMB’S WIRES
SECURE BOMB AGAINST SLIPPING
PROTECT BOMB AGAINST SHOCKS

Secure in the attitude found and do not lift before having checked for an anti-lift ignition device.

PASSENGERS.................... LEAD AWAY FROM BOMB

L2 *Move passengers at least 4 seat rows away from the bomb location. On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*
Passengers near the bomb should protect their heads with pillows, blankets.
All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables should be in their full upright position.
Service items may need to be collected in order to secure tray tables.

L1 CREW REST AREAS.................... EVACUATE

L2 *For aircraft equipped with crew rest areas (FCRC, LDMCR, BCRC).*

L1 PORTABLE ELECTRONIC DEVICES....................SWITCH OFF

L2 *The cabin crews must command passengers to switch off all portable electronic devices.*

L1 BOMB....................CHECK NO ANTI-LIFT DEVICE

L2 *To check for an anti-lift switch or lever, slide a string or stiff card, (such as the emergency information card) under the bomb, without disturbing the bomb.*
If the string or card cannot be slipped under the bomb, it may indicate that an anti-lift switch or lever is present and that the bomb cannot be moved.

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

If a card is used and can be slid under the bomb, leave it under the bomb and move together with the bomb.
If it is not possible to move the bomb, then it should be surrounded with a single thin sheet of plastic (e. g. trash bag), then with wetted materials, and other blast attenuation materials such as seat cushions and soft carry-on baggage. Move personnel as far away from the bomb location as possible.

L1 EMERGENCY EQUIPMENT....................REMOVE AND STOW

L2 *Emergency equipment (PBE, fire extinguisher, etc.) located close to the LRBL must be removed and stowed in alternate location.*

L1 GALLEY/IFE POWER....................OFF

L2 *All galley and IFE equipment located close to the LRBL must be switched off.*

L1 ● **If the bomb can be moved:**

RH AFT CABIN DOOR SLIDE....................DISARM
LEAST RISK BOMB LOCATION (LRBL)....................PREPARE

L2 *Build up a platform of solid baggage against the door up to about 25 cm (10 in) below the middle of the door.*
On top of this, build up at least 25 cm (10 in) of wetted material such as blankets and pillows.
Place a single thin sheet of plastic (e.g. trash bag) on top of the wetted materials. This prevents any possible short circuit.

CAUTION	*DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.*

L1 BOMB INDICATION LINE....................POSITION

Note: *A bomb location indicator line is a 6 ft to 8 ft (1.8 m to 2.4 m) line (e.g. neckties, headset cord, or belts connected together) preferably of constrating color, that helps the responding bomb squad find the precise location of the suspect device within the LRBL stack once constructed.*

Position the bomb indication line from the location on the platform where you will place the suspect device, EXTENDING outward into the aisle.

BOMB....................MOVE TO LRBL

L2 *Carefully carry in the attitude found and place on top of the wetted materials in the same attitude and as close to the door structure as possible.*

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

CAUTION	*Ensure that the suspect device, when placed on the stack against the door, is above the slide pack but not against the door handle, and if possible, avoid placement in the view port.*

L1 LEAST RISK BOMB LOCATION (LRBL)..COMPLETE

L2 *Place an additional single thin sheet of plastic over the bomb.*

CAUTION	*DO NOT OMIT THE PLASTIC SHEETS, AS THE SUSPECT DEVICE COULD GET WET AND POSSIBLY SHORT CIRCUIT ELECTRONIC COMPONENTS CAUSING INADVERTENT DEVICE ACTIVATION.*

L1 Build up at 25 cm (10 in) of wetted material around the sides and on top of the bomb.

DO NOT PLACE ANYTHING BETWEEN THE BOMB AND THE DOOR, AND MINIMIZE AIRSPACE AROUND THE BOMB.

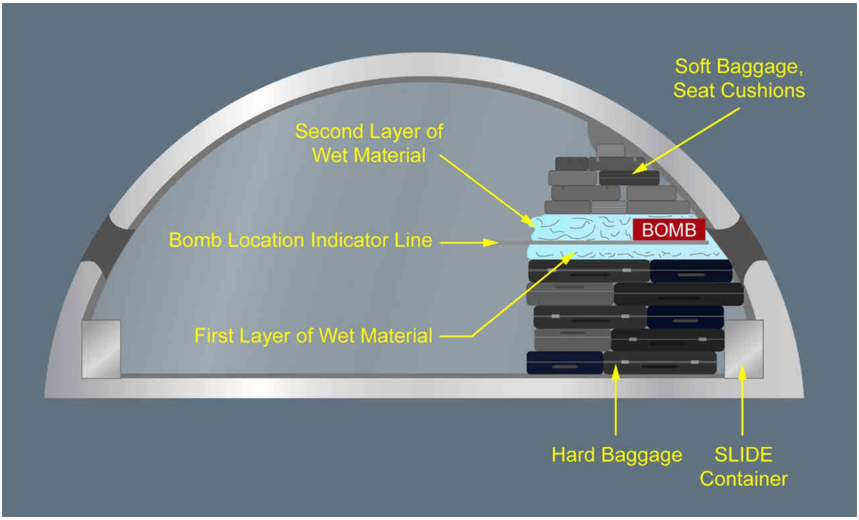
L2 *The idea is to build up a protective surrounding of the bomb so that the explosive force is directed in the only unprotected area into the door structure.*
Fill the area around the bomb with seat cushions and other soft materials such as hand luggage (saturated with water or any other nonflammable liquid) up to the cabin ceiling, compressing as much as possible. Secure the LRBL stack in place using belt, ties or other appropriate materials. The more material stacked around the bomb, the less the damage will be.

L1 USE ONLY SOFT MATERIAL. AVOID USING MATERIALS CONTAINING ANY INFLAMMABLE LIQUID AND ANY METAL OBJECTS WHICH COULD BECOME DANGEROUS PROJECTILES.

Continued on the following page

[QRH] BOMB ON BOARD (Cont'd)

LRBL STACK


Soft Baggage, Seat Cushions
Second Layer of Wet Material
Bomb Location Indicator Line
BOMB
First Layer of Wet Material
Hard Baggage
SLIDE Container

PASSENGERS.. MOVE/ADVISE

L2 *Move passengers at least 4 seat rows away from the least risk bomb location (RH aft cabin door). On full flights, it may be necessary to double up passengers to achieve standoff from the suspect device.*

Passengers near the bomb should protect their heads with pillows, blankets. All passengers must remain seated with seatbelts on and, if possible, head below the top of the head rest. Seat backs and tray tables must be in their full upright position.

L1 CABIN CREW.. NOTIFY COCKPIT CREW

L2 *Cabin crew notify the flight crew that the bomb is secured at the LRBL.*

L1 EVACUATION/DISEMBARKATION.. EXECUTE

L2 *Evacuate through normal and emergency exits on the opposite of the "bomb" location. Do not use the door just opposite the "bomb".*

Use all available airport facilities to disembark without delay.

[QRH] COCKPIT WINDSHIELD / WINDOW ARCING

Ident.: PRO-ABN-MISC-00012266.0001001 / 20 MAR 17

Applicable to: ALL

Affected WINDSHIELD / WINDOW WHC reset button..PULL

In case of electrical arcing, pull the Window Heat Computer reset button that is located on the affected side.

- *Burning smell or smoke identified as coming from the bottom left corner of CAPT windshield or bottom right corner of the F/O windshield.*
- *WINDSHIELD/WINDOW LEFT SIDE - WHC 1 C/B (261 VU)*
- *WINDSHIELD/WINDOW RIGHT SIDE - WHC 2 C/B (262 VU).*

[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED

Ident.: PRO-ABN-MISC-00012265.0001001 / 05 MAY 22
Applicable to: ALL

SHOULDER HARNESS...FASTEN
TOUCH THE CRACK WITH A PEN (OR CAREFULLY WITH FINGERNAIL)

- **If no crack on cockpit side:**

  NO LIMITATION

  The inner ply is not affected. Therefore, the window/windshield is still able to sustain the differential pressure up to the maximum flight level.

- **If cracks on cockpit side:**

  CREW OXY MASKS...USE

  MAX FL : 230 / MEA-MORA

  The inner ply is affected. The flight crew is not able to easily determine if other plies are affected. Descend to FL 230/MEA-MORA and reduce differential pressure to 5 PSI.

  Note: *The maximum flight level is restricted to FL 230/MEA-MORA to obtain ΔP 5 PSI, without resulting in an excessive cabin altitude and an CAB PR EXCESS CAB ALTalert.*

  The following procedure enables maintaining ΔP 5 PSI in manual cabin pressure mode:

  CAB PRESS MODE SEL...MAN

  DISREGARD THE CAB ALT TARGET TABLE DISPLAYED ON THE ECAM
  MAN V/S CTL...AS RQRD

  SET THE CABIN ALTITUDE ACCORDING TO THE TABLE BELOW TO MAINTAIN ΔP 5 PSI

ΔP = 5 PSI	FL	100	150	200	230
	CABIN ALTITUDE	0	3 000	6 000	8 000

  - **When ΔP is 5 PSI:**

    CREW OXY MASKS...REMOVE

  - **Below FL 100:**

    CAB PRESS MODE SEL...AUTO

Note: *Due to the increased noise level, pay particular attention to visual warnings.*

- **If visibility not sufficient for approach due to damage:**

  CONSIDER AUTOLAND

Continued on the following page

[QRH] COCKPIT WINDSHIELD / WINDOW CRACKED (Cont'd)

- **For approach, if AUTOLAND not available:**

  CAB PRESS MODE SEL.......................................MAN
  MAN V/S CTL.......................................FULL UP

  MAX SPEED : 230 kt
  PF SLIDING WINDOW.......................................OPEN

[QRH] DITCHING

Ident.: PRO-ABN-MISC-00021902.0018001 / 05 JUN 18
Applicable to: LV-KAN, LV-KAO

This procedure applies when engines are running.
If engines are not running, *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated* procedure, which includes the ditching procedure when the engines are failed.

ATC...NOTIFY
ATC XPDR 7700...CONSIDER
PREPARE CABIN and COCKPIT

L2 *Notify the cabin crew of the nature of the emergency and indicate intentions.*

Specify the available time, in order to:
- *Secure loose equipment*
- *Prepare survival equipment*
- *Lock belts and shoulder harnesses.*

L1 JETTISON..ON
GPWS SYS...OFF
GPWS TERR..OFF

L2 *Set both the SYS pb-sw and the TERR pb-sw to OFF, in order to prevent nuisance warnings.*

L1 SIGNS...ON
EMER EXIT LT...ON
COMMERCIAL...OFF
LDG ELEV...SELECT 00
BARO...SET
DISREGARD NORM C/Ls
ELT (when conditions permit).............................ON

- **For approach and ditching:**

  KEEP LANDING GEAR UP
  SLATS / FLAPS..MAX AVAIL
  JETTISON...OFF

  FOR FLARE: TARGET PITCH 11° & MIN V/S

- **At 2 000 ft AGL:**

  CAB PRESS MODE SEL.....................................CHECK AUTO
  ALL BLEEDS (ENGs & APU)................................OFF
  CABIN CREW...NOTIFY FOR DITCHING
  DITCHING pb ....ON

Continued on the following page

[QRH] DITCHING (Cont'd)

L2 *The direction of ditching depends mainly on wind direction and sea state and these factors may be considered as follows:*

1. Wind direction:

This may be determined by observation of the waves, which move and break downwind. Spray from wave tops is also a reliable indicator.

2. Wind speed:

The following guidelines can be used to evaluate wind speed:

A few white crests	:	*8-17 kt*
Many white crests	:	*17-26 kt*
Streaks of foam along water	:	*23-35 kt*
Spray from waves	:	*35-43 kt*

3. Sea state:

This is best determined from a height of 500 ft to 1 000 ft. At lower height, the direction of the swell may be less obvious than the direction of the waves, even though the waves are much smaller.

When there is no swell, align into the wind. In the presence of swell, and provided that drift does not exceed 10 °, ditch parallel to the swell and as nearly into the wind as possible. If drift exceeds 10 °, ditch into wind. The presence of drift on touchdown is not dangerous, but every effort should be made to minimize roll.

L1

- **At 500 ft AGL:**

BRACE FOR IMPACT............ORDER

- **At touchdown:**

ALL ENG MASTERS............OFF
APU MASTER sw............OFF

- **After ditching:**

ATC (VHF 1)............NOTIFY

L2 *With engines and APU shutdown, only VHF 1 is supplied.*

L1 ALL FIRE pb (ENGs & APU)............PUSH
ALL AGENTS (ENGs & APU)............DISCH
EVACUATION............INITIATE
ALL BATs............OFF

[QRH] DITCHING

Ident.: PRO-ABN-MISC-00021902.0010001 / 05 JUN 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

This procedure applies when engines are running.
If engines are not running, *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If ditching anticipated* procedure, which includes the ditching procedure when the engines are failed.

ATC....................NOTIFY
ATC XPDR 7700....................CONSIDER
PREPARE CABIN and COCKPIT

L2 *Notify the cabin crew of the nature of the emergency and indicate intentions.*

Specify the available time, in order to:
- *Secure loose equipment*
- *Prepare survival equipment*
- *Lock belts and shoulder harnesses.*

L1 GPWS SYS....................OFF
GPWS TERR....................OFF

L2 *Set both the SYS pb-sw and the TERR pb-sw to OFF, in order to prevent nuisance warnings.*

L1 SIGNS....................ON
EMER EXIT LT....................ON
COMMERCIAL....................OFF
LDG ELEV....................SELECT 00
BARO....................SET
DISREGARD NORM C/Ls
ELT (when conditions permit)....................ON

- **For approach and ditching:**

  KEEP LANDING GEAR UP
  SLATS / FLAPS....................MAX AVAIL

  FOR FLARE: TARGET PITCH 11° & MIN V/S

- **At 2 000 ft AGL:**

  CAB PRESS MODE SEL....................CHECK AUTO
  ALL BLEEDS (ENGs & APU)....................OFF
  CABIN CREW....................NOTIFY FOR DITCHING
  DITCHING pb ....ON

Continued on the following page

[QRH] DITCHING (Cont'd)

L2 *The direction of ditching depends mainly on wind direction and sea state and these factors may be considered as follows:*

1. *Wind direction:*
   This may be determined by observation of the waves, which move and break downwind. Spray from wave tops is also a reliable indicator.
2. *Wind speed:*

   The following guidelines can be used to evaluate wind speed:
   A few white crests : 8-17 kt
   Many white crests : 17-26 kt
   Streaks of foam along water : 23-35 kt
   Spray from waves : 35-43 kt

3. *Sea state:*
   This is best determined from a height of 500 ft to 1 000 ft. At lower height, the direction of the swell may be less obvious than the direction of the waves, even though the waves are much smaller.
   When there is no swell, align into the wind. In the presence of swell, and provided that drift does not exceed 10 °, ditch parallel to the swell and as nearly into the wind as possible. If drift exceeds 10 °, ditch into wind. The presence of drift on touchdown is not dangerous, but every effort should be made to minimize roll.

L1 ● **At 500 ft AGL:**
BRACE FOR IMPACT.. ORDER

● **At touchdown:**
ALL ENG MASTERS..OFF
APU MASTER sw ....OFF

● **After ditching:**
ATC (VHF 1)..NOTIFY

L2 *With engines and APU shutdown, only VHF 1 is supplied.*

L1 ALL FIRE pb (ENGs & APU)...PUSH
ALL AGENTS (ENGs & APU)... DISCH
EVACUATION... INITIATE
ALL BATs...OFF

[QRH] EMER EVAC

Ident.: PRO-ABN-MISC-00012258.0002001 / 03 NOV 22
Applicable to: ALL

Apply this procedure when considering an emergency evacuation, or when required by the ECAM. Carefully analyze the situation before deciding to evacuate passengers. However do not waste valuable time.

AIRCRAFT / PARKING BRK.......................STOP / ON
ATC (VHF1).......................NOTIFY
CABIN CREW (PA).......................ALERT
ΔP (only if MAN CAB PR has been used).......................CHECK ZERO

● **If ΔP not at zero:**
  CAB PR MODE SEL.......................MAN
  V/S CTL.......................FULL UP

ALL ENG MASTERS.......................OFF
ALL FIRE pb (ENGs & APU).......................PUSH
ALL AGENTS (ENGs & APU).......................AS RQRD

The use of agents is required if the ENG FIRE or APU FIRE alert is displayed.

■ **If Evacuation required:**
  EVACUATION.......................INITIATE

  Make a short and precise announcement to order the emergency evacuation.
  Press the EVAC COMMAND pb ◁ .

  ALL BATs.......................OFF

■ **If Evacuation not required:**
  CABIN CREW and PASSENGERS (PA).......................NOTIFY

[QRH] EMER LANDING
ALL ENG FAILURE

Ident.: PRO-ABN-MISC-00014901.0005001 / 06 MAR 17
Applicable to: ALL

Apply the following if not able to maintain altitude after the loss of thrust near the ground.

■ **If ditching anticipated:**

APU..START

L2 *APU start is inhibited after the LAND RECOVERY pb-sw is set to ON. Therefore, if time and conditions permit, delay the LAND RECOVERY pb-sw selection after the connection of the APU generator to the electrical network.*

L1
- **For slats extension:**
  LAND RECOVERY..ON

L/G LEVER..CHECK UP
FOR LANDING..USE FLAP 2

L2 *EMER GEN is lost at slat extension. If the APU generator is not available, the aircraft is supplied only by the batteries.*

L1 VAPP..DETERMINE

Weight	120 t / 265 klb	140 t / 310 klb	160 t / 355 klb	180 t / 400 klb	200 t / 440 klb	220 t / 485 klb	240 t / 530 klb
VAPP	150 kt	150 kt	153 kt	160 kt	167 kt	173 kt	180 kt

DITCHING pb ....ON

L2 *Ditch the aircraft parallel to the swell. If that causes a strong crosswind, ditch the aircraft into the wind.*

L1
- **At 500 ft AGL or below:**
  BRACE FOR IMPACT..ORDER

- **For flare:**
  TOUCH DOWN AT MIN V/S
  TARGET PITCH ATT 11 °

- **At touchdown:**
  ALL ENG MASTERS..OFF
  APU MASTER SW..OFF
  EMER EVAC PROC..APPLY

L2 *Refer to PRO-ABN-MISC [QRH] EMER EVAC*

Continued on the following page

[QRH] EMER LANDING (Cont'd)
ALL ENG FAILURE

L1 ■ **If forced landing anticipated:**

APU.. START

L2 *APU start is inhibited after the LAND RECOVERY pb-sw is set to ON. Therefore, if time and conditions permit, delay the LAND RECOVERY pb-sw selection after the connection of the APU generator to the electrical network.*

L1
- ● **For slats extension:**

  LAND RECOVERY..ON

FOR LANDING..USE FLAP 2

L2 *EMER GEN is lost at slat extension. If the APU generator is not available, the aircraft is supplied only by the batteries.*

L1 VAPP..DETERMINE

Weight	120 t / 265 klb	140 t / 310 klb	160 t / 355 klb	180 t / 400 klb	200 t / 440 klb	220 t / 485 klb	240 t / 530 klb
VAPP	150 kt	150 kt	153 kt	160 kt	167 kt	173 kt	180 kt

GND SPLRs.. ARM

- ● **At 1 000 ft AGL at the latest:**

  L/G GRVTY EXTN.. DOWN

  L2 *Disregard the "USE MAN PITCH TRIM" message on the PFD, because the stabilizer is jammed, due to not sufficient hydraulic power.*

  L1
  - ● **When L/G downlocked:**

    L/G LEVER.. DOWN

- ● **At 500 ft AGL or below:**

  BRACE FOR IMPACT..ORDER

- ● **For flare:**

  TOUCH DOWN AT MIN V/S

- ● **At touchdown:**

  ALL ENG MASTERS..OFF
  APU MASTER SW..OFF
  EMER EVAC PROC.. APPLY

  L2 *Refer to PRO-ABN-MISC [QRH] EMER EVAC*

[QRH] FORCED LANDING

Ident.: PRO-ABN-MISC-00021903.0010001 / 05 JUN 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

This procedure applies when engines are running.
If engines are not running, *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated* procedure, which includes the forced landing procedure when the engines are failed.

ATC..NOTIFY
ATC XPDR 7700..CONSIDER
PREPARE CABIN and COCKPIT

L2 *Notify the cabin crew of the nature of the emergency and indicate intentions.*

Specify the available time, in order to:
- *Secure loose equipment*
- *Prepare survival equipment*
- *Lock belts and shoulder harnesses.*

L1 GPWS SYS..OFF
GPWS TERR..OFF

L2 *Set both the SYS pb-sw and the TERR pb-sw to OFF, in order to prevent nuisance warnings.*

L1 SIGNS..ON
EMER EXIT LT..ON
COMMERCIAL..OFF
LDG ELEV..SET

L2 *If not known, select an approximate value.*

L1 BARO..SET
DISREGARD NORM C/Ls
ELT (when conditions permit)..ON

- **For approach and landing:**
  RAM AIR..ON

  L2 *Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft on the ground.*

  L1 L/G lever..DOWN
  SLATS / FLAPS..MAX AVAIL
  GND SPLR..ARM
  MAX BRK PR 1 000 PSI

- **At 2 000 ft AGL:**
  CABIN CREW..NOTIFY FOR LANDING

Continued on the following page

[QRH] FORCED LANDING (Cont'd)

- **At 500 ft AGL:**

  BRACE FOR IMPACT.. ORDER

- **At touchdown:**

  ALL ENG MASTERS.. OFF
  APU MASTER sw .... OFF

  BRAKES ON ACCU ONLY

- **When aircraft stopped:**

  PARKING BRK.. ON
  ATC (VHF 1).. NOTIFY

  L2 *With engines and APU shutdown, only VHF 1 is supplied.*

  L1 ALL FIRE pb (ENGs & APU).. PUSH
  ALL AGENTS (ENGs & APU).. DISCH

  - **If evacuation required:**

    EVACUATION.. INITIATE

    L2 *Make a short and precise announcement to order the emergency evacuation.*
    Press the EVAC COMMAND pb ◁ *.*

    L1 ALL BATs.. OFF

  - **If evacuation not required:**

    CABIN CREW and PASSENGERS (PA).. NOTIFY

[QRH] FORCED LANDING

Ident.: PRO-ABN-MISC-00021903.0020001 / 05 JUN 18
Applicable to: LV-KAN, LV-KAO

This procedure applies when engines are running.
If engines are not running, *Refer to PRO-ABN-ENG [QRH] ALL ENG FAIL - If forced landing anticipated* procedure, which includes the forced landing procedure when the engines are failed.

ATC .... NOTIFY
ATC XPDR 7700 .... CONSIDER
PREPARE CABIN and COCKPIT

L2 *Notify the cabin crew of the nature of the emergency and indicate intentions.*

Specify the available time, in order to:
- *Secure loose equipment*
- *Prepare survival equipment*
- *Lock belts and shoulder harnesses.*

L1 JETTISON .... ON
GPWS SYS .... OFF
GPWS TERR .... OFF

L2 *Set both the SYS pb-sw and the TERR pb-sw to OFF, in order to prevent nuisance warnings.*

L1 SIGNS .... ON
EMER EXIT LT .... ON
COMMERCIAL .... OFF
LDG ELEV .... SET

L2 *If not known, select an approximate value.*

L1 BARO .... SET
DISREGARD NORM C/Ls
ELT (when conditions permit) .... ON

- **For approach and landing:**

  RAM AIR .... ON

  L2 *Switch the RAM AIR on, in order to ensure entire depressurization of the aircraft on the ground.*

  L1 L/G lever .... DOWN
  SLATS / FLAPS .... MAX AVAIL
  GND SPLR .... ARM
  JETTISON .... OFF

  MAX BRK PR 1 000 PSI

Continued on the following page

[QRH] FORCED LANDING (Cont'd)

- **At 2 000 ft AGL:**
  CABIN CREW.......................................NOTIFY FOR LANDING
- **At 500 ft AGL:**
  BRACE FOR IMPACT.......................................ORDER
- **At touchdown:**
  ALL ENG MASTERS.......................................OFF
  APU MASTER sw ....OFF
  BRAKES ON ACCU ONLY
- **When aircraft stopped:**
  PARKING BRK.......................................ON
  ATC (VHF 1).......................................NOTIFY

L2 *With engines and APU shutdown, only VHF 1 is supplied.*

L1 ALL FIRE pb (ENGs & APU).......................................PUSH
ALL AGENTS (ENGs & APU).......................................DISCH

- ■ **If evacuation required:**
  EVACUATION.......................................INITIATE

L2 *Make a short and precise announcement to order the emergency evacuation.*
Press the EVAC COMMAND pb ◁ .

L1 ALL BATs.......................................OFF

- ■ **If evacuation not required:**
  CABIN CREW and PASSENGERS (PA).......................................NOTIFY

[QRH] OVERWEIGHT LANDING

Ident.: PRO-ABN-MISC-00023459.0012001 / 17 NOV 20
Applicable to: ALL

CONSIDER JETTISON ◁
USE CONF FULL FOR LANDING UNLESS SPECIFIED BY ABN PROC OR LIMITED BY LANDING PERF
LDG DIST PROC..APPLY

- **For approach:**
  PACK 1+2....................................OFF OR SUPPLIED BY APU

  L2 *The selection of the PACKS to OFF (or to APU BLEED) increases the maximum thrust available from the engines, in the case of a go-around.*

  L1
  - **If landing CONF other than FULL:** USE CONF 1+F FOR GO AROUND

  SPEED AT RUNWAY THRESHOLD: VLS

  L2 *This speed target is applicable in manual landing and autoland. Reduce the speed to reach VLS at the runway threshold.*

  L1 MINIMIZE V/S AT TOUCHDOWN

  L2 *Touch down as smoothly as possible to reduce the V/S. The maximum touchdown V/S should not exceed 360 ft/min. The main landing gears must touch down as symmetrically as possible.*

L1
- **For landing:**
  INCREASE FLARE HEIGHT

  USE MAX REVERSE ASAP

  L2 *It is recommended to use the reverse as soon as possible, in order to limit the braking action.*

  L1
  - **After nosewheel touchdown:** APPLY BRAKES AS NECESSARY

    L2 *It is recommended that the flight crew uses the maximum available runway length to limit the braking energy.*

L1
- **When landing completed:**
  BRAKE FANS ◁ ....ON

  L2 *Be prepared for tire deflation, if temperatures exceed 800 °C.*

[QRH] SEVERE TURBULENCE

Ident.: PRO-ABN-MISC-10-00002018.0001001 / 17 MAR 17
Applicable to: ALL

When possible, the flight crew should plan to fly above or around areas of severe turbulence. If turbulence is unavoidable, aim to keep the speed in the region of the target speed given in this section, so as to provide the best protection against the effect of gust on the aircraft structure, whilst maintaining an adequate margin above VLS.
Sufficient buffet margin exists at optimum altitude. In order to further increase the margin to buffet onset, consider descending to a lower altitude.
Severe turbulence is defined as turbulence that causes large, abrupt changes in altitude and/or attitude. It usually causes large variations in airspeed.
Occupants are forced violently against their seat belts and loose objects will move around the aircraft.
If severe turbulence occurs during a flight, the flight crew must make a logbook entry in order to initiate maintenance action.

Note: *Recommendations for severe turbulence are also applicable to extreme turbulence.*

Ident.: PRO-ABN-MISC-10-00002019.0002001 / 23 NOV 16
Applicable to: ALL

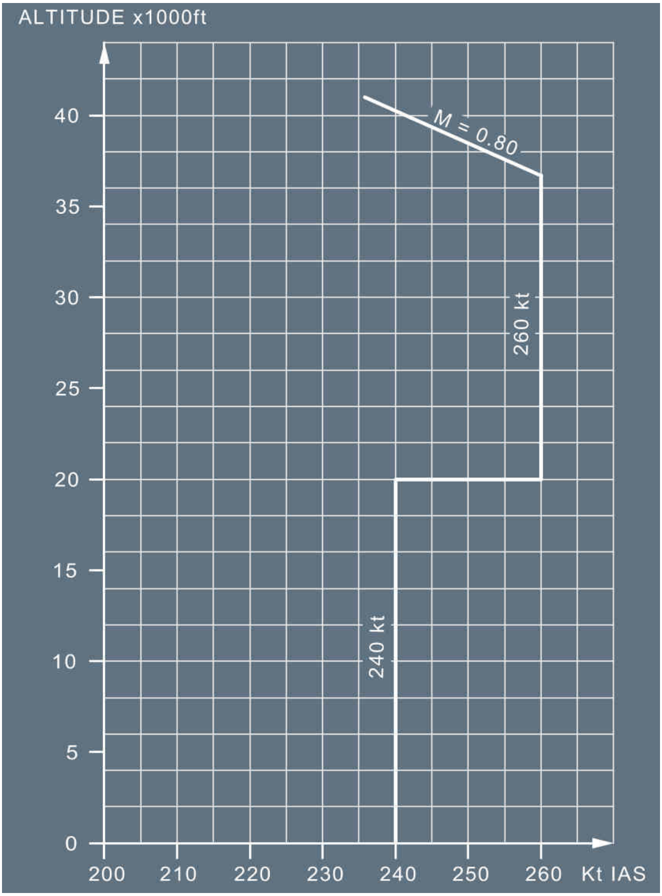
Before the aircraft enters an area where turbulence is expected:
- All loose equipment must be secured in the cockpit and in the cabin
- The flight crew must set the SEAT BELTS sw to ON.

Ident.: PRO-ABN-MISC-10-00002020.0001001 / 10 DEC 09
Applicable to: ALL

Keep the autopilot ON.
When thrust changes are excessive : Disconnect autothrust.
For approach : Use autothrust for managed speed.

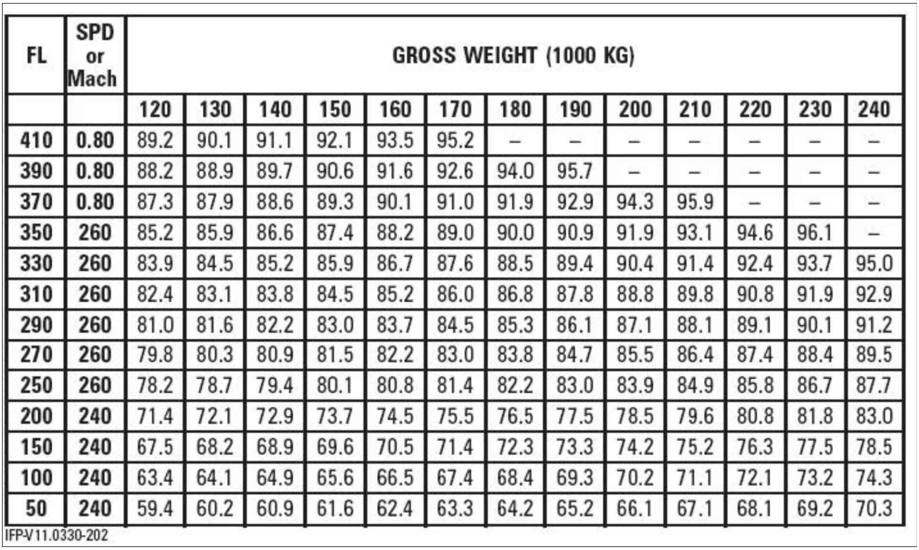
Ident.: PRO-ABN-MISC-10-00002021.0005001 / 16 MAR 11
Applicable to: ALL

Set the thrust to give the recommended speed (*Refer to PRO-ABN-MISC [QRH] Thrust Setting For Recommended Speed*) . This thrust setting aims to obtain, in stabilized conditions, the speed for turbulence penetration given in the graph below.
Change thrust only in case of an extreme variation in airspeed, and do not chase your Mach or airspeed.
A transient increase is preferable to a loss of speed that decreases buffet margins and is difficult to recover.


ALTITUDE x1000ft
40
35
30
25
20
15
10
5
0
M = 0.80
260 kt
240 kt
200
210
220
230
240
250
260
Kt IAS

Ident.: PRO-ABN-MISC-10-00006026.0020001 / 18 MAR 11

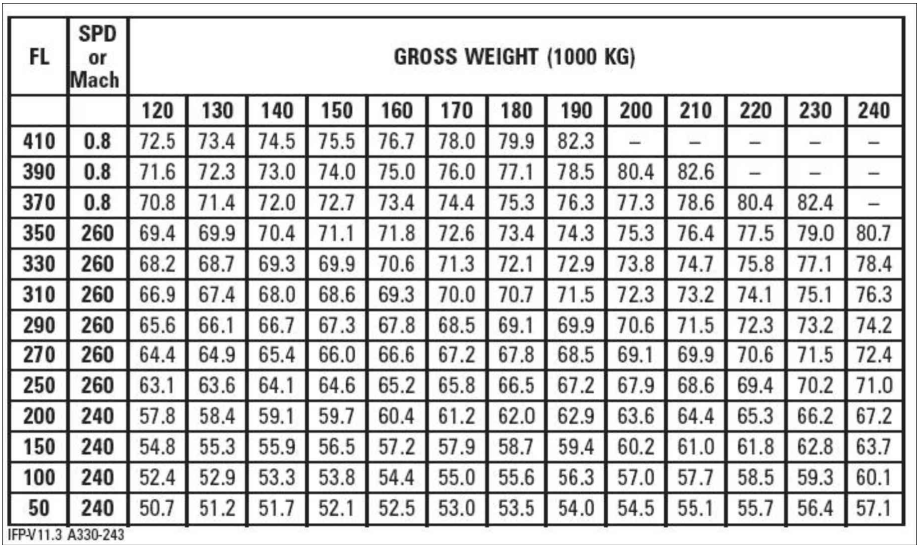
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO



FL	SPD or Mach	GROSS WEIGHT (1000 KG)												
		120	130	140	150	160	170	180	190	200	210	220	230	240
410	0.80	89.2	90.1	91.1	92.1	93.5	95.2	–	–	–	–	–	–	–
390	0.80	88.2	88.9	89.7	90.6	91.6	92.6	94.0	95.7	–	–	–	–	–
370	0.80	87.3	87.9	88.6	89.3	90.1	91.0	91.9	92.9	94.3	95.9	–	–	–
350	260	85.2	85.9	86.6	87.4	88.2	89.0	90.0	90.9	91.9	93.1	94.6	96.1	–
330	260	83.9	84.5	85.2	85.9	86.7	87.6	88.5	89.4	90.4	91.4	92.4	93.7	95.0
310	260	82.4	83.1	83.8	84.5	85.2	86.0	86.8	87.8	88.8	89.8	90.8	91.9	92.9
290	260	81.0	81.6	82.2	83.0	83.7	84.5	85.3	86.1	87.1	88.1	89.1	90.1	91.2
270	260	79.8	80.3	80.9	81.5	82.2	83.0	83.8	84.7	85.5	86.4	87.4	88.4	89.5
250	260	78.2	78.7	79.4	80.1	80.8	81.4	82.2	83.0	83.9	84.9	85.8	86.7	87.7
200	240	71.4	72.1	72.9	73.7	74.5	75.5	76.5	77.5	78.5	79.6	80.8	81.8	83.0
150	240	67.5	68.2	68.9	69.6	70.5	71.4	72.3	73.3	74.2	75.2	76.3	77.5	78.5
100	240	63.4	64.1	64.9	65.6	66.5	67.4	68.4	69.3	70.2	71.1	72.1	73.2	74.3
50	240	59.4	60.2	60.9	61.6	62.4	63.3	64.2	65.2	66.1	67.1	68.1	69.2	70.3

IFP-V11.0330-202

Ident.: PRO-ABN-MISC-10-00006026.0024001 / 18 MAR 11
Applicable to: LV-KHT, LV-KHU



FL	SPD or Mach	GROSS WEIGHT (1000 KG)												
		120	130	140	150	160	170	180	190	200	210	220	230	240
410	0.8	72.5	73.4	74.5	75.5	76.7	78.0	79.9	82.3	–	–	–	–	–
390	0.8	71.6	72.3	73.0	74.0	75.0	76.0	77.1	78.5	80.4	82.6	–	–	–
370	0.8	70.8	71.4	72.0	72.7	73.4	74.4	75.3	76.3	77.3	78.6	80.4	82.4	–
350	260	69.4	69.9	70.4	71.1	71.8	72.6	73.4	74.3	75.3	76.4	77.5	79.0	80.7
330	260	68.2	68.7	69.3	69.9	70.6	71.3	72.1	72.9	73.8	74.7	75.8	77.1	78.4
310	260	66.9	67.4	68.0	68.6	69.3	70.0	70.7	71.5	72.3	73.2	74.1	75.1	76.3
290	260	65.6	66.1	66.7	67.3	67.8	68.5	69.1	69.9	70.6	71.5	72.3	73.2	74.2
270	260	64.4	64.9	65.4	66.0	66.6	67.2	67.8	68.5	69.1	69.9	70.6	71.5	72.4
250	260	63.1	63.6	64.1	64.6	65.2	65.8	66.5	67.2	67.9	68.6	69.4	70.2	71.0
200	240	57.8	58.4	59.1	59.7	60.4	61.2	62.0	62.9	63.6	64.4	65.3	66.2	67.2
150	240	54.8	55.3	55.9	56.5	57.2	57.9	58.7	59.4	60.2	61.0	61.8	62.8	63.7
100	240	52.4	52.9	53.3	53.8	54.4	55.0	55.6	56.3	57.0	57.7	58.5	59.3	60.1
50	240	50.7	51.2	51.7	52.1	52.5	53.0	53.5	54.0	54.5	55.1	55.7	56.4	57.1

IFP-V11.3 A330-243

Ident.: PRO-ABN-MISC-10-00006027.0001001 / 09 JUN 15
Applicable to: ALL

If the flight crew flies the aircraft manually:
- The flight crew may expect large variations in altitude, but should not chase altitude
- The flight crew should consider descending to or below the OPT FL, in order to increase the margin to buffet.

[QRH] TAILSTRIKE

Ident.: PRO-ABN-MISC-00012303.0001001 / 04 JUN 19
Applicable to: ALL

LAND ASAP

MAX FL : 100 / MEA-MORA

Limit to FL 100 or to MEA or MORA to minimize structural stress.
Return to the airport for damage assessment.

[QRH] VOLCANIC ASH ENCOUNTER

Ident.: PRO-ABN-MISC-00012302.0006001 / 05 JUN 18
Applicable to: ALL

180 ° TURN.. INITIATE

The performance of a 180 ° turn will usually enable the aircraft to exit the volcanic ash clouds as quickly as possible, because volcanic ash clouds can extend for hundreds of nautical miles.

ATC.. NOTIFY

Note: *Electrostatic conditions may cause communication problems.*

A/THR.. OFF

This prevents autothrust from generating thrust variations.

THRUST (IF COND PERMIT).. REDUCE

Reduced thrust minimizes ash ingestion.
If altitude permits, reduce thrust to idle. This maximizes the engine surge margin, and lowers engine turbine temperature.

CREW OXY MASKS.. USE / 100 % / EMER
CABIN CREW.. NOTIFY
OXYGEN PASSENGER MASK MAN ON.. AS RQRD

Depending on contamination.

ENG ANTI ICE.. ON
WING ANTI ICE.. ON
PACK FLOW.. HI

Maximum air bleed gives the engines additional stall margin.

CARGO ISOL VALVES.. OFF

Note: *To prevent a cargo smoke warning being triggered.*

ENGINE PARAMETERS.. MONITOR

Monitor EGT, in particular. If the EGT exceeds limits, it may become necessary to consider a precautionary engine shutdown and engine restart in flight.

Note: *In the case of precautionary shutdown:*

- *Restart when clear of the volcanic ash cloud*
- *Upon restart, the engine may accelerate very slowly. Do not misinterpret this as a failure to start.*

Continued on the following page

[QRH] VOLCANIC ASH ENCOUNTER (Cont'd)

- *Consider that the compressor and turbine blades have been eroded and avoid sudden changes in thrust. Fuel flow and EGT may increase.*

AIRSPEED INDICATIONS...MONITOR

If airspeed is unreliable or lost, Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items.

Note: *If all engines flame out and speed indications are lost, Refer to ALL ENGINES FAILURE procedure to get the required pitch attitude for the optimum relight speed.*
In case of engine failure, switch off the wing anti ice before engine restart.

- **If visibility not sufficient for approach due to windshield damage:**

  CONSIDER AUTOLAND

  - **For approach, if AUTOLAND not available:**

    CAB PRESS MODE SEL...MAN
    MAN V/S CTL...FULL UP

    Due to the increased noise level, pay particular attention to visual warnings.

    MAX SPEED : 230 kt
    PF SLIDING WINDOW...OPEN

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[MEM] UNRELIABLE SPEED INDICATION

Applicable to: LV-FVH, LV-GKO

Ident.: PRO-ABN-NAV-AH-00017898.0001001 / 17 MAR 17

- **If the safe conduct of the flight is impacted:**

AP	OFF
A/THR	OFF
FD	OFF

PITCH/THRUST

Below THRUST RED ALT	15° / TOGA
Above THRUST RED ALT and Below FL 100	10° / CLB
Above THRUST RED ALT and Above FL 100	5° / CLB
FLAPS (if CONF 0(1)(2)(3))	MAINTAIN CURRENT CONF
FLAPS (if CONF FULL)	SELECT CONF 3 AND MAINTAIN
SPEEDBRAKES	CHECK RETRACTED
L/G	UP

When at or above MSA or Circuit Altitude: Level off for troubleshooting

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017901.0003001 / 10 NOV 22

- **To level off:**

AP.....OFF
A/THR.....OFF
FD.....OFF
SPEEDBRAKES.....CHECK RETRACTED
PITCH/THRUST TABLE.....APPLY

PITCH / THRUST FOR LEVEL OFF					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
SLATS / FLAPS EXTENDED					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
3	**7.5°**	**80%** (170 kt)	**74%** (155 kt)	**68%** (135 kt)	**60%** (120 kt)
2	**7.5°**	**78%** (180 kt)	**72%** (165 kt)	**66%** (145 kt)	**58%** (125 kt)
1+F	**6.5°**	**76%** (205 kt)	**70%** (190 kt)	**64%** (165 kt)	**56%** (145 kt)
1	**9.5°**	**74%** (205 kt)	**70%** (185 kt)	**62%** (165 kt)	**54%** (140 kt)
CLEAN					
PITCH	**FL**	**THRUST % N1** (Resultant speed)			
4° at or below FL250	**100**	**76%** (280 kt)	**71%** (255 kt)	**64%** (225 kt)	**56%** (195 kt)
	200	**84%** (280 kt)	**79%** (255 kt)	**73%** (225 kt)	**65%** (195 kt)
	250	**88%** (275 kt)	**83%** (255 kt)	**77%** (225 kt)	**69%** (195 kt)
3° above FL250	**300**	**93%** (300 kt)	**88%** (275 kt)	**83%** (245 kt)	**76%** (215 kt)
	350	/	**92%** (270 kt)	**86%** (240 kt)	**80%** (210 kt)
	400	/	/	**92%** (235 kt)	**85%** (210 kt)

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:
- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017903.0004001 / 01 OCT 19

- **When flight path is stabilized:**
  AP....................OFF
  A/THR....................OFF
  FD....................OFF
  SPEEDBRAKES....................CHECK RETRACTED
  FLIGHT PATH....................KEEP STABILIZED

RESPECT STALL WARNING

Ident.: PRO-ABN-NAV-AH-00017920.0002001 / 03 NOV 22

AFFECTED ADR IDENTIFICATION

PROBE/WINDOW HEAT....................ON
ALL SPEED INDICATIONS....................CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.

- **If at least one ADR confirmed reliable:**
  RELIABLE AIR DATA....................USE
  UNRELIABLE ADR pb(s)....................OFF
- **If affected ADR(s) cannot be identified, or all ADRs affected:**
  - **When above FL 250:**
    KEEP ONE ADR ON
    TWO ADR pbs....................OFF
    This prevents the flight control laws from using two coherent but unreliable ADR data.
    ATC/XPDR....................ALT RPTG OFF
    - **For flight continuation:** USE PITCH/THRUST TABLES
  - **When below FL 250, if speed still unreliable:**
    ALL ADR pbs....................OFF
    SPEED....................FLY THE GREEN

    Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

    ATC/XPDR....................ALT RPTG OFF
    NAV ADR 1+2+3 FAULT ECAM PROCEDURE....................APPLY

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017904.0003001 / 10 NOV 22

CLIMB

CLIMB IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
THRUST	**FL**	**PITCH (Resultant speed)**			
CLB	**50**	**9°** (275 kt)	**10°** (260 kt)	**13°** (225 kt)	**14°** (240 kt)
	100	**8°** (280 kt)	**9°** (260 kt)	**12°** (220 kt)	**13°** (230 kt)
	200	**6°** (285 kt)	**7°** (260 kt)	**9°** (225 kt)	**10°** (220 kt)
	300	**5°** (270 kt)	**5°** (260 kt)	**6°** (230 kt)	**7°** (210 kt)
	400	/	/	**4°** (230 kt)	**5°** (200 kt)

CRUISE

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

LEVEL FLIGHT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
PITCH	**FL**	**THRUST % N1 (Resultant speed)**			
4° at or below FL250	**100**	**76%** (280 kt)	**71%** (255 kt)	**64%** (225 kt)	**56%** (195 kt)
	200	**84%** (280 kt)	**79%** (255 kt)	**73%** (225 kt)	**65%** (195 kt)
	250	**88%** (275 kt)	**83%** (255 kt)	**77%** (225 kt)	**69%** (195 kt)
3° above FL250	**300**	**93%** (300 kt)	**88%** (275 kt)	**83%** (245 kt)	**76%** (215 kt)
	350	/	**92%** (270 kt)	**86%** (240 kt)	**80%** (210 kt)
	400	/	/	**92%** (235 kt)	**85%** (210 kt)

Note: If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 3% in cruise and 1.5% in approach.
Fuel flow will increase by about 10%.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

DESCENT

DESCENT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
THRUST	**PITCH**	**Resultant speed**			
IDLE	**2°**	275 kt	250 kt	220 kt	190 kt

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

LEVEL FLIGHT					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
WITH LANDING GEAR UP					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
0	**5°**	**70%** (250 kt)	**66%** (225 kt)	**60%** (200 kt)	**52%** (180 kt)
1	**9.5°**	**74%** (205 kt)	**70%** (185 kt)	**62%** (165 kt)	**54%** (140 kt)
1+F	**6.5°**	**76%** (205 kt)	**70%** (190 kt)	**64%** (165 kt)	**56%** (145 kt)
2	**7.5°**	**78%** (180 kt)	**72%** (165 kt)	**66%** (145 kt)	**58%** (125 kt)
WITH LANDING GEAR DOWN					
3	**7.5°**	**84%** (170 kt)	**78%** (155 kt)	**72%** (140 kt)	**64%** (120 kt)

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

APPROACH IN CONF 3 AND L/G EXTENDED					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
CONF	**PITCH**	**THRUST (% N1)**			
3	**4°**	**60%**	**56%**	**50%**	**44%**

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: LV-GHQ, LV-GIF, LV-GKP

Ident.: PRO-ABN-NAV-AH-00017898.0001001 / 17 MAR 17

- **If the safe conduct of the flight is impacted:**

  AP.. OFF
  A/THR.. OFF
  FD.. OFF

  PITCH/THRUST
  Below THRUST RED ALT..................................15° / TOGA
  Above THRUST RED ALT and Below FL 100.............................. 10° / CLB
  Above THRUST RED ALT and Above FL 100..............................5° / CLB
  FLAPS (if CONF 0(1)(2)(3))............................ MAINTAIN CURRENT CONF
  FLAPS (if CONF FULL)............................ SELECT CONF 3 AND MAINTAIN
  SPEEDBRAKES..............................CHECK RETRACTED
  L/G.. UP

  When at or above MSA or Circuit Altitude: Level off for troubleshooting

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017901.0013001 / 10 NOV 22

- **To level off:**

AP....................OFF
A/THR....................OFF
FD....................OFF
SPEEDBRAKES....................CHECK RETRACTED

- **Below FL 250:**

  BKUP SPD/ALT pb....................USE

  This action is reversible.

  SPEED....................FLY THE GREEN

  Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

- **Above FL 250:**

  PITCH/THRUST TABLE....................APPLY

PITCH / THRUST FOR LEVEL OFF					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
SLATS / FLAPS EXTENDED					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
3	**7.5°**	**80%** (170 kt)	**74%** (155 kt)	**68%** (135 kt)	**60%** (120 kt)
2	**7.5°**	**78%** (180 kt)	**72%** (165 kt)	**66%** (145 kt)	**58%** (125 kt)
1+F	**6.5°**	**76%** (205 kt)	**70%** (190 kt)	**64%** (165 kt)	**56%** (145 kt)
1	**9.5°**	**74%** (205 kt)	**70%** (185 kt)	**62%** (165 kt)	**54%** (140 kt)
CLEAN					
PITCH	**FL**	**THRUST % N1** (Resultant speed)			
4° at or below FL250	**100**	**76%** (280 kt)	**71%** (255 kt)	**64%** (225 kt)	**56%** (195 kt)
	200	**84%** (280 kt)	**79%** (255 kt)	**73%** (225 kt)	**65%** (195 kt)
	250	**88%** (275 kt)	**83%** (255 kt)	**77%** (225 kt)	**69%** (195 kt)
3° above FL250	**300**	**93%** (300 kt)	**88%** (275 kt)	**83%** (245 kt)	**76%** (215 kt)
	350	/	**92%** (270 kt)	**86%** (240 kt)	**80%** (210 kt)
	400	/	/	**92%** (235 kt)	**85%** (210 kt)

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Ident.: PRO-ABN-NAV-AH-00017903.0003001 / 01 OCT 19

- **When flight path is stabilized:**

  AP.....OFF
  A/THR.....OFF
  FD.....OFF
  SPEEDBRAKES.....CHECK RETRACTED

  - **Below FL 250:**

    BKUP SPD/ALT pb.....USE

    This action is reversible.

    SPEED.....FLY THE GREEN

    Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

  - **Above FL 250:**

    FLIGHT PATH.....KEEP STABILIZED

RESPECT STALL WARNING

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017920.0003001 / 03 NOV 22

AFFECTED ADR IDENTIFICATION

PROBE/WINDOW HEAT....................ON
ALL SPEED INDICATIONS....................CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.

■ **If at least one ADR confirmed reliable:**

RELIABLE AIR DATA....................USE
UNRELIABLE ADR pb(s)....................OFF

■ **If affected ADR(s) cannot be identified, or all ADRs affected:**

KEEP ONE ADR ON
TWO ADR pbs....................OFF

This prevents the flight control laws from using two coherent but unreliable ADR data.

ATC/XPDR....................ALT RPTG OFF

● **When above FL 250:**

USE PITCH/THRUST TABLES

● **When below FL 250, if speed still unreliable:**

BKUP SPD/ALT pb....................USE

This action is reversible.

SPEED....................FLY THE GREEN

Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017904.0003001 / 10 NOV 22

CLIMB

CLIMB IN CLEAN CONFIGURATION					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
THRUST	**FL**	**PITCH (Resultant speed)**			
CLB	**50**	**9°** (275 kt)	**10°** (260 kt)	**13°** (225 kt)	**14°** (240 kt)
	100	**8°** (280 kt)	**9°** (260 kt)	**12°** (220 kt)	**13°** (230 kt)
	200	**6°** (285 kt)	**7°** (260 kt)	**9°** (225 kt)	**10°** (220 kt)
	300	**5°** (270 kt)	**5°** (260 kt)	**6°** (230 kt)	**7°** (210 kt)
	400	/	/	**4°** (230 kt)	**5°** (200 kt)

CRUISE

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:
- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

LEVEL FLIGHT IN CLEAN CONFIGURATION					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
PITCH	**FL**	**THRUST % N1 (Resultant speed)**			
4° **at or below** **FL250**	**100**	**76%** (280 kt)	**71%** (255 kt)	**64%** (225 kt)	**56%** (195 kt)
	200	**84%** (280 kt)	**79%** (255 kt)	**73%** (225 kt)	**65%** (195 kt)
	250	**88%** (275 kt)	**83%** (255 kt)	**77%** (225 kt)	**69%** (195 kt)
3° **above** **FL250**	**300**	**93%** (300 kt)	**88%** (275 kt)	**83%** (245 kt)	**76%** (215 kt)
	350	/	**92%** (270 kt)	**86%** (240 kt)	**80%** (210 kt)
	400	/	/	**92%** (235 kt)	**85%** (210 kt)

Note: *If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 3% in cruise and 1.5% in approach.*
Fuel flow will increase by about 10%.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

DESCENT

DESCENT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
THRUST	**PITCH**	**Resultant speed**			
IDLE	**2°**	275 kt	250 kt	220 kt	190 kt

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

LEVEL FLIGHT					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
WITH LANDING GEAR UP					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
0	**5°**	**70%** (250 kt)	**66%** (225 kt)	**60%** (200 kt)	**52%** (180 kt)
1	**9.5°**	**74%** (205 kt)	**70%** (185 kt)	**62%** (165 kt)	**54%** (140 kt)
1+F	**6.5°**	**76%** (205 kt)	**70%** (190 kt)	**64%** (165 kt)	**56%** (145 kt)
2	**7.5°**	**78%** (180 kt)	**72%** (165 kt)	**66%** (145 kt)	**58%** (125 kt)
WITH LANDING GEAR DOWN					
3	**7.5°**	**84%** (170 kt)	**78%** (155 kt)	**72%** (140 kt)	**64%** (120 kt)

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

APPROACH IN CONF 3 AND L/G EXTENDED					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
CONF	**PITCH**	**THRUST (% N1)**			
3	**4°**	**60%**	**56%**	**50%**	**44%**

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: LV-FVI, LV-KAN, LV-KAO

Ident.: PRO-ABN-NAV-AH-00017898.0001001 / 17 MAR 17

- **If the safe conduct of the flight is impacted:**

AP	OFF
A/THR	OFF
FD	OFF
PITCH/THRUST	
Below THRUST RED ALT	15° / TOGA
Above THRUST RED ALT and Below FL 100	10° / CLB
Above THRUST RED ALT and Above FL 100	5° / CLB
FLAPS (if CONF 0(1)(2)(3))	MAINTAIN CURRENT CONF
FLAPS (if CONF FULL)	SELECT CONF 3 AND MAINTAIN
SPEEDBRAKES	CHECK RETRACTED
L/G	UP

When at or above MSA or Circuit Altitude: Level off for troubleshooting

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017901.0003001 / 10 NOV 22

- **To level off:**

AP..........OFF
A/THR..........OFF
FD..........OFF
SPEEDBRAKES..........CHECK RETRACTED
PITCH/THRUST TABLE..........APPLY

PITCH / THRUST FOR LEVEL OFF					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
SLATS / FLAPS EXTENDED					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
3	**7.5°**	**80%** (170 kt)	**74%** (155 kt)	**68%** (135 kt)	**60%** (120 kt)
2	**7.5°**	**78%** (180 kt)	**72%** (165 kt)	**66%** (145 kt)	**58%** (125 kt)
1+F	**6.5°**	**76%** (205 kt)	**70%** (190 kt)	**64%** (165 kt)	**56%** (145 kt)
1	**9.5°**	**74%** (205 kt)	**70%** (185 kt)	**62%** (165 kt)	**54%** (140 kt)
CLEAN					
PITCH	**FL**	**THRUST % N1** (Resultant speed)			
4° **at or below** **FL250**	**100**	**76%** (280 kt)	**71%** (255 kt)	**64%** (225 kt)	**56%** (195 kt)
	200	**84%** (280 kt)	**79%** (255 kt)	**73%** (225 kt)	**65%** (195 kt)
	250	**88%** (275 kt)	**83%** (255 kt)	**77%** (225 kt)	**69%** (195 kt)
3° **above** **FL250**	**300**	**93%** (300 kt)	**88%** (275 kt)	**83%** (245 kt)	**76%** (215 kt)
	350	/	**92%** (270 kt)	**86%** (240 kt)	**80%** (210 kt)
	400	/	/	**92%** (235 kt)	**85%** (210 kt)

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:
- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017903.0001001 / 17 MAR 17

- **When flight path is stabilized:**

  AP....................OFF
  A/THR....................OFF
  FD....................OFF
  SPEEDBRAKES....................CHECK RETRACTED
  FLIGHT PATH.................... KEEP STABILIZED

RESPECT STALL WARNING

Disregard “RISK OF UNDUE STALL WARNING” STATUS message, if displayed on ECAM.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017920.0002001 / 03 NOV 22

AFFECTED ADR IDENTIFICATION

PROBE/WINDOW HEAT....................ON
ALL SPEED INDICATIONS....................CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.

- **If at least one ADR confirmed reliable:**

  RELIABLE AIR DATA....................USE
  UNRELIABLE ADR pb(s)....................OFF

- **If affected ADR(s) cannot be identified, or all ADRs affected:**
  - **When above FL 250:**

    KEEP ONE ADR ON
    TWO ADR pbs....................OFF

    This prevents the flight control laws from using two coherent but unreliable ADR data.

    ATC/XPDR....................ALT RPTG OFF
    - **For flight continuation:** USE PITCH/THRUST TABLES
  - **When below FL 250, if speed still unreliable:**

    ALL ADR pbs....................OFF
    SPEED....................FLY THE GREEN

    Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

    ATC/XPDR....................ALT RPTG OFF
    NAV ADR 1+2+3 FAULT ECAM PROCEDURE....................APPLY

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017904.0003001 / 10 NOV 22

CLIMB

CLIMB IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
THRUST	**FL**	**PITCH (Resultant speed)**			
CLB	**50**	**9°** (275 kt)	**10°** (260 kt)	**13°** (225 kt)	**14°** (240 kt)
	100	**8°** (280 kt)	**9°** (260 kt)	**12°** (220 kt)	**13°** (230 kt)
	200	**6°** (285 kt)	**7°** (260 kt)	**9°** (225 kt)	**10°** (220 kt)
	300	**5°** (270 kt)	**5°** (260 kt)	**6°** (230 kt)	**7°** (210 kt)
	400	/	/	**4°** (230 kt)	**5°** (200 kt)

CRUISE

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

LEVEL FLIGHT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
PITCH	**FL**	**THRUST % N1 (Resultant speed)**			
4° at or below FL250	**100**	**76%** (280 kt)	**71%** (255 kt)	**64%** (225 kt)	**56%** (195 kt)
	200	**84%** (280 kt)	**79%** (255 kt)	**73%** (225 kt)	**65%** (195 kt)
	250	**88%** (275 kt)	**83%** (255 kt)	**77%** (225 kt)	**69%** (195 kt)
3° above FL250	**300**	**93%** (300 kt)	**88%** (275 kt)	**83%** (245 kt)	**76%** (215 kt)
	350	/	**92%** (270 kt)	**86%** (240 kt)	**80%** (210 kt)
	400	/	/	**92%** (235 kt)	**85%** (210 kt)

Note: *If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 3% in cruise and 1.5% in approach.*
Fuel flow will increase by about 10%.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

DESCENT

DESCENT IN CLEAN CONFIGURATION					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
THRUST	**PITCH**	**Resultant speed**			
IDLE	**2°**	275 kt	250 kt	220 kt	190 kt

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

LEVEL FLIGHT					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
WITH LANDING GEAR UP					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
0	**5°**	**70%** (250 kt)	**66%** (225 kt)	**60%** (200 kt)	**52%** (180 kt)
1	**9.5°**	**74%** (205 kt)	**70%** (185 kt)	**62%** (165 kt)	**54%** (140 kt)
1+F	**6.5°**	**76%** (205 kt)	**70%** (190 kt)	**64%** (165 kt)	**56%** (145 kt)
2	**7.5°**	**78%** (180 kt)	**72%** (165 kt)	**66%** (145 kt)	**58%** (125 kt)
WITH LANDING GEAR DOWN					
3	**7.5°**	**84%** (170 kt)	**78%** (155 kt)	**72%** (140 kt)	**64%** (120 kt)

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

APPROACH IN CONF 3 AND L/G EXTENDED					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
CONF	**PITCH**	**THRUST (% N1)**			
3	**4°**	**60%**	**56%**	**50%**	**44%**

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: LV-KHT

Ident.: PRO-ABN-NAV-AH-00017898.0001001 / 17 MAR 17

- **If the safe conduct of the flight is impacted:**

AP...OFF
A/THR...OFF
FD...OFF

PITCH/THRUST
Below THRUST RED ALT...15° / TOGA
Above THRUST RED ALT and Below FL 100...10° / CLB
Above THRUST RED ALT and Above FL 100...5° / CLB
FLAPS (if CONF 0(1)(2)(3))...MAINTAIN CURRENT CONF
FLAPS (if CONF FULL)...SELECT CONF 3 AND MAINTAIN
SPEEDBRAKES...CHECK RETRACTED
L/G...UP

When at or above MSA or Circuit Altitude: Level off for troubleshooting

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017901.0008001 / 10 NOV 22

- **To level off:**
  AP.....OFF
  A/THR.....OFF
  FD.....OFF
  SPEEDBRAKES.....CHECK RETRACTED
  PITCH/THRUST TABLE.....APPLY

PITCH / THRUST FOR LEVEL OFF					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
SLATS / FLAPS EXTENDED					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
3	**7.5°**	**64%** (170 kt)	**60%** (155 kt)	**54%** (135 kt)	**50%** (120 kt)
2	**7.5°**	**62%** (180 kt)	**58%** (165 kt)	**54%** (145 kt)	**48%** (125 kt)
1+F	**6.5°**	**62%** (205 kt)	**58%** (190 kt)	**52%** (170 kt)	**46%** (145 kt)
1	**9.5°**	**60%** (200 kt)	**56%** (185 kt)	**52%** (165 kt)	**46%** (140 kt)
CLEAN					
PITCH	**FL**	**THRUST % N1** (Resultant speed)			
4° at or below FL250	**100**	**61%** (280 kt)	**57%** (255 kt)	**52%** (225 kt)	**47%** (195 kt)
	200	**68%** (280 kt)	**64%** (255 kt)	**59%** (225 kt)	**57%** (195 kt)
	250	**71%** (275 kt)	**67%** (250 kt)	**62%** (225 kt)	**56%** (195 kt)
3° above FL250	**300**	**76%** (300 kt)	**72%** (275 kt)	**67%** (245 kt)	**61%** (210 kt)
	350	/	**76%** (265 kt)	**71%** (240 kt)	**65%** (210 kt)
	400	/	/	**75%** (235 kt)	**69%** (205 kt)

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:
- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017903.0004001 / 01 OCT 19

- **When flight path is stabilized:**
  AP.....OFF
  A/THR.....OFF
  FD.....OFF
  SPEEDBRAKES.....CHECK RETRACTED
  FLIGHT PATH..... KEEP STABILIZED

RESPECT STALL WARNING

Ident.: PRO-ABN-NAV-AH-00017920.0002001 / 03 NOV 22

AFFECTED ADR IDENTIFICATION

PROBE/WINDOW HEAT.....ON
ALL SPEED INDICATIONS.....CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.

- **If at least one ADR confirmed reliable:**
  RELIABLE AIR DATA.....USE
  UNRELIABLE ADR pb(s).....OFF
- **If affected ADR(s) cannot be identified, or all ADRs affected:**
  - **When above FL 250:**
    KEEP ONE ADR ON
    TWO ADR pbs..... OFF
    This prevents the flight control laws from using two coherent but unreliable ADR data.
    ATC/XPDR.....ALT RPTG OFF
    - **For flight continuation:** USE PITCH/THRUST TABLES
  - **When below FL 250, if speed still unreliable:**
    ALL ADR pbs..... OFF
    SPEED.....FLY THE GREEN

    Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

    ATC/XPDR.....ALT RPTG OFF
    NAV ADR 1+2+3 FAULT ECAM PROCEDURE.....APPLY

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017904.0008001 / 10 NOV 22

CLIMB

CLIMB IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
THRUST	**FL**	**PITCH (Resultant speed)**			
CLB	**50**	**9°** (275 kt)	**10°** (260 kt)	**13°** (225 kt)	**14°** (240 kt)
	100	**8°** (280 kt)	**9°** (265 kt)	**12°** (225 kt)	**13°** (235 kt)
	200	**6°** (290 kt)	**7°** (265 kt)	**9°** (230 kt)	**10°** (225 kt)
	300	**5°** (270 kt)	**5°** (265 kt)	**6°** (240 kt)	**7°** (220 kt)
	400	/	/	**4°** (235 kt)	**5°** (205 kt)

CRUISE

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

LEVEL FLIGHT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
PITCH	**FL**	**THRUST % N1 (Resultant speed)**			
4° at or below FL250	**100**	**61%** (280 kt)	**57%** (255 kt)	**52%** (225 kt)	**47%** (195 kt)
	200	**68%** (280 kt)	**64%** (255 kt)	**59%** (225 kt)	**57%** (195 kt)
	250	**71%** (275 kt)	**67%** (250 kt)	**62%** (225 kt)	**56%** (195 kt)
3° above FL250	**300**	**76%** (300 kt)	**72%** (275 kt)	**67%** (245 kt)	**61%** (210 kt)
	350	/	**76%** (265 kt)	**71%** (240 kt)	**65%** (210 kt)
	400	/	/	**75%** (235 kt)	**69%** (205 kt)

Note: *If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 3% in cruise and 1.5% in approach.*
Fuel flow will increase by about 10%.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

DESCENT

DESCENT IN CLEAN CONFIGURATION					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
THRUST	**PITCH**	**Resultant speed**			
IDLE	**2°**	280 kt	255 kt	225 kt	195 kt

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

LEVEL FLIGHT					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
WITH LANDING GEAR UP					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
0	**5°**	**58%** (250 kt)	**54%** (225 kt)	**50%** (200 kt)	**46%** (180 kt)
1	**9.5°**	**60%** (200 kt)	**56%** (185 kt)	**52%** (165 kt)	**46%** (140 kt)
1+F	**6.5°**	**62%** (205 kt)	**58%** (190 kt)	**52%** (170 kt)	**46%** (145 kt)
2	**7.5°**	**62%** (180 kt)	**58%** (165 kt)	**54%** (145 kt)	**48%** (125 kt)
WITH LANDING GEAR DOWN					
3	**7.5°**	**68%** (170 kt)	**64%** (155 kt)	**58%** (140 kt)	**52%** (120 kt)

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

APPROACH IN CONF 3 AND L/G EXTENDED					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
CONF	**PITCH**	**THRUST (% N1)**			
3	**4°**	**50%**	**48%**	**42%**	**38%**

[MEM] UNRELIABLE SPEED INDICATION

Applicable to: LV-KHU

Ident.: PRO-ABN-NAV-AH-00017898.0001001 / 17 MAR 17

- **If the safe conduct of the flight is impacted:**

  AP.......... OFF
  A/THR.......... OFF
  FD.......... OFF

  PITCH/THRUST
  Below THRUST RED ALT.......... 15° / TOGA
  Above THRUST RED ALT and Below FL 100.......... 10° / CLB
  Above THRUST RED ALT and Above FL 100.......... 5° / CLB
  FLAPS (if CONF 0(1)(2)(3)).......... MAINTAIN CURRENT CONF
  FLAPS (if CONF FULL).......... SELECT CONF 3 AND MAINTAIN
  SPEEDBRAKES.......... CHECK RETRACTED
  L/G.......... UP

  When at or above MSA or Circuit Altitude: Level off for troubleshooting

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017901.0008001 / 10 NOV 22

- **To level off:**

AP....................OFF
A/THR....................OFF
FD....................OFF
SPEEDBRAKES....................CHECK RETRACTED
PITCH/THRUST TABLE....................APPLY

PITCH / THRUST FOR LEVEL OFF					
		240 t **530 000 lb**	**200 t** **440 000 lb**	**160 t** **350 000 lb**	**120 t** **260 000 lb**
SLATS / FLAPS EXTENDED					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
3	**7.5°**	**64%** (170 kt)	**60%** (155 kt)	**54%** (135 kt)	**50%** (120 kt)
2	**7.5°**	**62%** (180 kt)	**58%** (165 kt)	**54%** (145 kt)	**48%** (125 kt)
1+F	**6.5°**	**62%** (205 kt)	**58%** (190 kt)	**52%** (170 kt)	**46%** (145 kt)
1	**9.5°**	**60%** (200 kt)	**56%** (185 kt)	**52%** (165 kt)	**46%** (140 kt)
CLEAN					
PITCH	**FL**	**THRUST % N1** (Resultant speed)			
4° **at or below FL250**	**100**	**61%** (280 kt)	**57%** (255 kt)	**52%** (225 kt)	**47%** (195 kt)
	200	**68%** (280 kt)	**64%** (255 kt)	**59%** (225 kt)	**57%** (195 kt)
	250	**71%** (275 kt)	**67%** (250 kt)	**62%** (225 kt)	**56%** (195 kt)
3° **above** **FL250**	**300**	**76%** (300 kt)	**72%** (275 kt)	**67%** (245 kt)	**61%** (210 kt)
	350	/	**76%** (265 kt)	**71%** (240 kt)	**65%** (210 kt)
	400	/	/	**75%** (235 kt)	**69%** (205 kt)

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:
- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017903.0001001 / 17 MAR 17

- **When flight path is stabilized:**

  AP.....OFF
  A/THR.....OFF
  FD.....OFF
  SPEEDBRAKES.....CHECK RETRACTED
  FLIGHT PATH.....KEEP STABILIZED

RESPECT STALL WARNING

Disregard "RISK OF UNDUE STALL WARNING" STATUS message, if displayed on ECAM.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017920.0002001 / 03 NOV 22

AFFECTED ADR IDENTIFICATION

PROBE/WINDOW HEAT....................ON
ALL SPEED INDICATIONS....................CROSSCHECK

ADR3 and STBY speeds use the data of the same probe.

- **If at least one ADR confirmed reliable:**

  RELIABLE AIR DATA....................USE
  UNRELIABLE ADR pb(s)....................OFF

- **If affected ADR(s) cannot be identified, or all ADRs affected:**
  - **When above FL 250:**

    KEEP ONE ADR ON
    TWO ADR pbs.................... OFF

    This prevents the flight control laws from using two coherent but unreliable ADR data.

    ATC/XPDR....................ALT RPTG OFF

    - **For flight continuation:** USE PITCH/THRUST TABLES
  - **When below FL 250, if speed still unreliable:**

    ALL ADR pbs.................... OFF
    SPEED....................FLY THE GREEN

    Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

    ATC/XPDR....................ALT RPTG OFF
    NAV ADR 1+2+3 FAULT ECAM PROCEDURE....................APPLY

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

Ident.: PRO-ABN-NAV-AH-00017904.0008001 / 10 NOV 22

CLIMB

CLIMB IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
THRUST	**FL**	**PITCH (Resultant speed)**			
CLB	**50**	**9°** (275 kt)	**10°** (260 kt)	**13°** (225 kt)	**14°** (240 kt)
	100	**8°** (280 kt)	**9°** (265 kt)	**12°** (225 kt)	**13°** (235 kt)
	200	**6°** (290 kt)	**7°** (265 kt)	**9°** (230 kt)	**10°** (225 kt)
	300	**5°** (270 kt)	**5°** (265 kt)	**6°** (240 kt)	**7°** (220 kt)
	400	/	/	**4°** (235 kt)	**5°** (205 kt)

CRUISE

FLYING TECHNIQUE TO STABILIZE SPEED

Stabilize the altitude. When altitude is stabilized:

- If the pitch is above the target pitch, increase the thrust and maintain the altitude.
- If the pitch is below the target pitch, decrease the thrust and maintain the altitude.

When the pitch reaches the target pitch, adjust the thrust to keep this target pitch.

LEVEL FLIGHT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	200 t 440 000 lb	160 t 350 000 lb	120 t 260 000 lb
PITCH	**FL**	**THRUST % N1 (Resultant speed)**			
4° at or below FL250	**100**	**61%** (280 kt)	**57%** (255 kt)	**52%** (225 kt)	**47%** (195 kt)
	200	**68%** (280 kt)	**64%** (255 kt)	**59%** (225 kt)	**57%** (195 kt)
	250	**71%** (275 kt)	**67%** (250 kt)	**62%** (225 kt)	**56%** (195 kt)
3° above FL250	**300**	**76%** (300 kt)	**72%** (275 kt)	**67%** (245 kt)	**61%** (210 kt)
	350	/	**76%** (265 kt)	**71%** (240 kt)	**65%** (210 kt)
	400	/	/	**75%** (235 kt)	**69%** (205 kt)

Note: *If the failure is due to radome destruction, the drag will increase and therefore N1 must be increased by 3% in cruise and 1.5% in approach.*
Fuel flow will increase by about 10%.

Continued on the following page

[MEM] UNRELIABLE SPEED INDICATION (Cont'd)

DESCENT

DESCENT IN CLEAN CONFIGURATION					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
THRUST	**PITCH**	**Resultant speed**			
IDLE	**2°**	280 kt	255 kt	225 kt	195 kt

INITIAL / INTERMEDIATE APPROACH

APPLY FLYING TECHNIQUE TO STABILIZE SPEED

LEVEL FLIGHT					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
WITH LANDING GEAR UP					
CONF	**PITCH**	**THRUST % N1** (Resultant speed)			
0	**5°**	**58%** (250 kt)	**54%** (225 kt)	**50%** (200 kt)	**46%** (180 kt)
1	**9.5°**	**60%** (200 kt)	**56%** (185 kt)	**52%** (165 kt)	**46%** (140 kt)
1+F	**6.5°**	**62%** (205 kt)	**58%** (190 kt)	**52%** (170 kt)	**46%** (145 kt)
2	**7.5°**	**62%** (180 kt)	**58%** (165 kt)	**54%** (145 kt)	**48%** (125 kt)
WITH LANDING GEAR DOWN					
3	**7.5°**	**68%** (170 kt)	**64%** (155 kt)	**58%** (140 kt)	**52%** (120 kt)

FINAL APPROACH AT -3° DESCENT FLIGHT PATH

APPROACH IN CONF 3 AND L/G EXTENDED					
		240 t 530 000 lb	**200 t 440 000 lb**	**160 t 350 000 lb**	**120 t 260 000 lb**
CONF	**PITCH**	**THRUST (% N1)**			
3	**4°**	**50%**	**48%**	**42%**	**38%**

[QRH] ABNORMAL V ALPHA PROT

Ident.: PRO-ABN-NAV-00015267.0009001 / 16 MAY 18
Applicable to: ALL

- **If V Alpha Prot (top of the black and amber strip) exceeds Green Dot speed during stabilized flight path (level flight or stabilized climb) with steady heading.**
  V ALPHA PROT....................MONITOR
  Abnormal V Alpha Prot does not cause unreliable speed indications.
  - **During stabilized flight path with steady heading, if margin between V Alpha Prot and current airspeed decreases below 15kt:**
    ALTITUDE....................DO NOT INCREASE
    MACH....................DO NOT INCREASE

[QRH] ADR CHECK PROC

Ident.: PRO-ABN-NAV-00015075.0001001 / 17 MAR 17
Applicable to: ALL

For the ADR CHECK procedure, apply the UNRELIABLE SPEED INDICATION procedure. *Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items*.

[QRH] ALL ADR OFF

Ident.: PRO-ABN-NAV-00025097.0004001 / 08 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Apply this QRH procedure when requested by the NAV ADR 1+2+3 FAULT alert.

SPEED..FLY THE GREEN

Fly within the green area of the speed scale to ensure safe flight.
For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.

Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

PFD ALTITUDE: GPS

TCAS & ATC RPTG INOP

CABIN PRESS MODE SEL.. MAN
MAN V/S CTL...AS RQRD

Target CAB PRESS V/S:
- *Climb: 500 ft/min*
- *Descent: 300 ft/min.*

AIRCRAFT CRZ FL	*CAB ALT TARGET (ft)*
410	*8 000*
350	*6 500*
300	*5 000*
250	*2 500*
<200	*0*

LDG DIST PROC...APPLY

- **For approach:**

  SPEED...FLY THE GREEN

  Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.

  Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

  FOR LANDING: USE FLAP 3

  Note: Do not select CONF FULL so as not to degrade the handling qualities. Since ADR parameters are lost, the SFCCs will set CONF 1+F instead of CONF 1.

  APPR SPEED: BUSS TARGET SPEED

Continued on the following page

[QRH] ALL ADR OFF (Cont'd)

During approach, BUSS TARGET SPEED (green triangle) indicates VAPP.

- **When FLAP 2:**
  LDG GEAR GRVTY EXTN.............................. DOWN
- **When landing gear downlocked:**
  L/G lever.............................. DOWN
  GEAR DOWN indications.............................. CHECK

  N/W STEERING NOT AVAILABLE

  L/G DOORS REMAIN OPEN
- **During final approach:**
  MAN V/S CTL.............................. FULL UP

- **Before door opening:** CHECK ΔP ZERO

[QRH] ALL ADR OFF

Ident.: PRO-ABN-NAV-00025097.0003001 / 08 NOV 21
Applicable to: LV-GKO, LV-GKP

Apply this QRH procedure when requested by the NAV ADR 1+2+3 FAULT alert.

SPEED............FLY THE GREEN

Fly within the green area of the speed scale to ensure safe flight.
For slats/flaps retraction, it is better to fly at the top of the green area of the speed scale.

Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.

WHEN ALL ADR OFF BOTH FMS LOST

FM SOURCE............NORM
BACK UP NAV............USE

Revert to Back up NAV via the NAV B/UP prompt on the MCDU MENU page.

USE RMP FOR NAVAID TUNING

PFD ALTITUDE: GPS

TCAS & ATC RPTG INOP

CABIN PRESS MODE SEL............MAN
MAN V/S CTL............AS RQRD

Target CAB PRESS V/S:
- *Climb: 500 ft/min*
- *Descent: 300 ft/min.*

AIRCRAFT CRZ FL	*CAB ALT TARGET (ft)*
410	*8 000*
350	*6 500*
300	*5 000*
250	*2 500*
<200	*0*

LDG DIST PROC............APPLY

- **For approach:**

  SPEED............FLY THE GREEN

  Before extending the slats/flaps, it is better to fly at the bottom of the speed scale green area, and to be in straight flight.

Continued on the following page

[QRH] ALL ADR OFF (Cont'd)

Note: *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust tables.*

FOR LANDING: USE FLAP 3

Note: *Do not select CONF FULL so as not to degrade the handling qualities. Since ADR parameters are lost, the SFCCs will set CONF 1+F instead of CONF 1.*

GPWS FLAP MODE...OFF

APPR SPEED: BUSS TARGET SPEED

During approach, BUSS TARGET SPEED (green triangle) indicates VAPP.

- **When FLAP 2:**
  LDG GEAR GRVTY EXTN...DOWN
- **When landing gear downlocked:**
  L/G lever...DOWN
  GEAR DOWN indications...CHECK

  N/W STEERING NOT AVAILABLE

  L/G DOORS REMAIN OPEN
- **During final approach:**
  MAN V/S CTL...FULL UP

- **Before door opening:** CHECK ΔP ZERO

[QRH] IR ALIGNMENT IN ATT MODE

Ident.: PRO-ABN-NAV-00011424.0002001 / 04 NOV 20
Applicable to: ALL

If IR alignment is lost in flight, the navigation mode is inoperative (red ATT flag on the PFD, and red HDG flag on the ND).
Aircraft attitude and heading may be recovered by applying the following procedure:

IR (affected) MODE SEL...ATT
KEEP SPEED, HEADING AND FL CONSTANT FOR 30 s
FMS DATA page..SELECT
The DATA INDEX page is displayed.
IRS MONITOR key...PRESS
[SET HDG key] AIRCRAFT HDG...ENTER
CROSSCHECK HEADING REGULARLY WITH STBY COMPASS AND UPDATE AS REQUIRED

NAV ADR 1(2)(3) FAULT

Applicable to: ALL

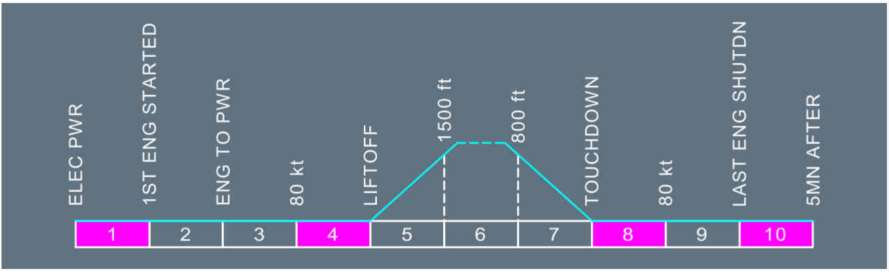
Ident.: PRO-ABN-NAV-A-00018482.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ADR 1(2)(3) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
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Continued on the following page

NAV ADR 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-A-00018075.0001001 / 21 MAR 16

L2 Note: *In case of simultaneous failure of ADR and IR (same ADIRU) apply ADR FAULT procedure before IR FAULT procedure.*

L1 ■ **ADR 1 FAULT:**

AIR DATA SWTG..CAPT ON 3

L2 *Select ADR 3 to captain side.*

L1 ADR 1 P/B..OFF

■ **ADR 2 FAULT:**

AIR DATA SWTG..F/O ON 3

L2 *Select ADR 3 to first officer side.*

L1 ADR 2 P/B..OFF

■ **ADR 3 FAULT:**

AIR DATA SWTG (IF ADR 3 IN USE)..NORM

ADR 3 P/B..OFF

Ident.: PRO-ABN-NAV-A-00018080.0001001 / 21 MAR 16

STATUS

	INOP SYS
CAT 3 SINGLE ONLY	CAT 3 DUAL ADR 1 (2) (3) GPWS (1) GPWS TERR (1)

(1) *(in case of ADR 1 failure)*

NAV ADR 1+2(1+3)(2+3) FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

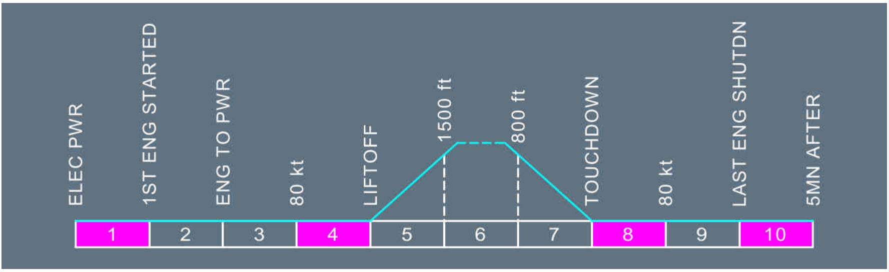
Ident.: PRO-ABN-NAV-B-00018483.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when two ADRs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00018084.0009001 / 05 MAY 22

Note: *In the case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

AIR DATA SWTG...CAPT ON 3 (NORM) (NORM)
ADRS (AFFECTED) P/B..OFF

L2 *The crewmember on the affected side may recover air data information by using the EFIS DMC rotary selector.*

L1
- **If NAV ADR 1+3 FAULT:**
  ATC/XPDR...SYS 2
- **If NAV ADR 2+3 FAULT:**
  ATC/XPDR...SYS 1
  - **If A.ICE CAPT AOA HEAT:**
    AVOID ICING CONDITIONS

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED...330/.82

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00018086.0003001 / 03 NOV 22

L12

STATUS

MAX SPEED.. 330/.82

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY
- **If NAV ADR 2+3 FAULT and A.ICE CAPT AOA HEAT:**
  AVOID ICING CONDITIONS

APPR PROC

FOR LDG... USE FLAP 3

This line is replaced by “FOR LDG: USE FLAP 3” when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

ALTN LAW: PROT LOST
BOTH PFDs ON SAME FMGEC

See (5)

FLS ◁ : F-APP + RAW ONLY

INOP SYS

F/CTL PROT
ADR 1+2 (1+3) (2+3)
AP 1+2
A/THR
GPWS (If ADR 1 failed.)
GPWS TERR (1)
TCAS (2)
ATC/XPDR 1 (3)
ATC/XPDR 2 (4)
CAT 2
GLS AUTOLAND ◁
GA SOFT ◁

(1) *(For aircraft equipped with EGPWS ◁ or T2CAS ◁ , if ADR 1 failed.)*
(2) *(In the case of NAV ADR 1+2 FAULT.)*
(3) *(In the case of NAV ADR 1+3 FAULT.)*
(4) *(In the case of NAV ADR 2+3 FAULT or NAV ADR 1+2 FAULT.)*
(5) *In the case of NAV ADR 1+3 FAULT or NAV ADR 2+3 FAULT.*

NAV ADR 1+2(1+3)(2+3) FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

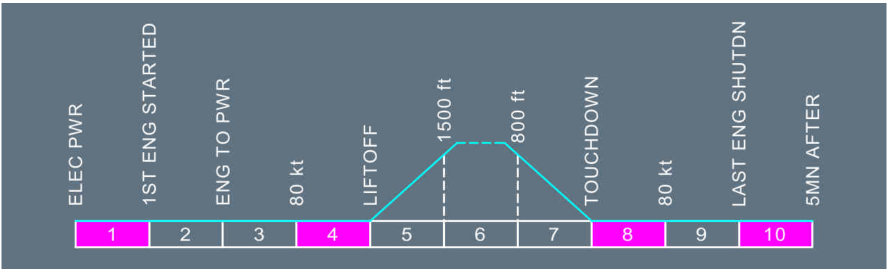
Ident.: PRO-ABN-NAV-B-00018483.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when two ADRs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00018084.0002001 / 22 MAR 17

L2 *Note:* *In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

L1 AIR DATA SWTG....................CAPT ON 3 (NORM) (NORM)
ADRS (AFFECTED) P/B....................OFF

L2 *Note:* *The crewmember on the affected side may recover air data information by using the EFIS DMC rotary selector.*

L1
- **If ADR 1 + 3 failed:**
  ATC/XPDR....................SYS 2
- **If ADR 2 + 3 failed:**
  ATC/XPDR....................SYS 1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED....................330/.82

Continued on the following page

NAV ADR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-B-00018086.0001001 / 03 NOV 22

L12

STATUS

MAX SPEED.. 330/.82

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY

APPR PROC

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

ALTN LAW: PROT LOST
BOTH PFDs ON SAME FMGEC

See (4)

FLS ◁ : F-APP + RAW ONLY

INOP SYS

F/CTL PROT
ADR 1+2 (1+3) (2+3)
AP 1+2
A/THR
GPWS (If ADR 1 failed.)
GPWS TERR (1)
TCAS (2)
ATC/XPDR 1 (3)
ATC/XPDR 2 (4)
CAT 2
GLS AUTOLAND ◁
GA SOFT ◁

(1) *(For aircraft equipped with EGPWS ◁ or TCAS ◁ , if ADR 1 failed.)*
(2) *(In the case of NAV ADR 1+2 FAULT.)*
(3) *(In the case of NAV ADR 1+3 FAULT.)*
(4) *In the case of NAV ADR 2+3 FAULT or NAV ADR 1+2 FAULT.*

NAV ADR 1+2+3 FAULT

Applicable to: LV-FVH, LV-GKO, LV-KHT

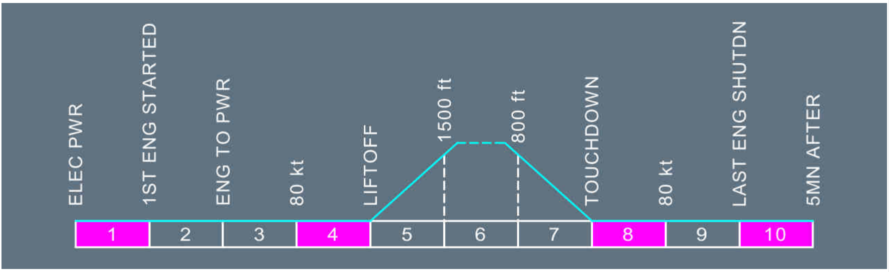
Ident.: PRO-ABN-NAV-R-00018484.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the three ADRs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-R-00018103.0012001 / 05 MAY 22

L2 This alert triggers if each of the 3 ADRs self-detects a failure or receives irrelevant data from the probes. This procedure requires that the flight crew set the 3 ADRs to OFF to replace the PFD's normal speed scale and altitude indication by the backup speed scale and GPS altitude indication.

L1 *Note:* *In the case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

AP+FD..OFF
A/THR..OFF

- **If at least two AOA probe heating are failed:**
  PROBE WINDOW HEAT..ON

ADR 1+2+3 P/B..OFF

L2 *The STALL WARNING remains operative.*

L1 SPD..FLY THE GREEN

L2 *Fly the green area of the speed scale to ensure safe flight.*

L1 *Note:* *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust table.*

STBY INST..MAY BE UNREL

L2 *ADR3 and STBY speeds use the data of the same probes. Therefore, standby instrument must be used with care.*

L1 MAX FL..REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

- **If at least one AOA probe heating is failed:**
  AVOID ICING CONDITIONS

ALL ADR OFF PROC..APPLY

L2 *Refer to PRO-ABN-NAV [QRH] ALL ADR OFF.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

USE RUDDER WITH CARE

L2 *The rudder travel limit is frozen at the value it had at the moment when the failure occurred, and may not be in correct position for the flight speed. At slats extension, full rudder travel authority may be recovered.*

L1 SPD BRK...DO NOT USE

Ident.: PRO-ABN-NAV-R-00018104.0007001 / 12 JUL 18

L12

STATUS

STBY INST.............................. MAY BE UNREL

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY

SPD BRK..............................DO NOT USE

USE RUDDER WITH CARE

AVOID ICING CONDITIONS

APPR PROC

FOR LDG.............................. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.............................. APPLY

ALTN LAW: PROT LOST

INOP SYS

ADR 1+2+3
F/CTL PROT
CAB PR 1+2
RUD TRV LIM
AP 1+2
A/THR
GPWS
GPWS TERR ◁
TCAS
See (1)
REAC W/S DET
PRED W/S DET ◁
ATC/XPDR 1
ATC/XPDR 2
GA SOFT

(1) Note: *Upon a triple ADR failure, the TCAS becomes inoperative. However, TCAS is displayed in the INOP SYS list depending on the TCAS manufacturer.*

NAV ADR 1+2+3 FAULT

Applicable to: LV-GHQ, LV-GIF, LV-GKP

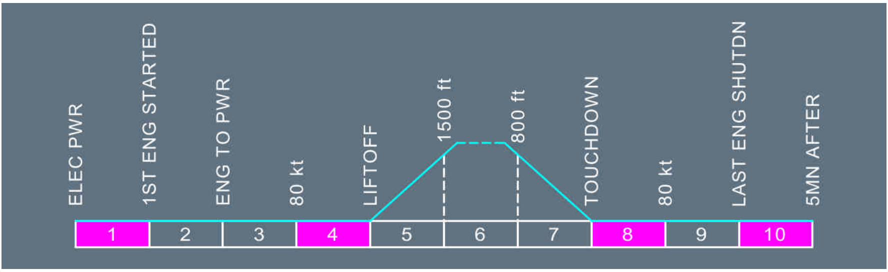
Ident.: PRO-ABN-NAV-R-00018484.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the three ADRs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-R-00018103.0007001 / 08 NOV 21

L2 This alert triggers if each of the 3 ADRs self-detects a failure or receives irrelevant data from the probes. This procedure requires that the flight crew set the 3 ADRs to OFF to replace the PFD's normal speed scale and altitude indication by the backup speed scale and GPS altitude indication.

Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.

L1 AP+FD..OFF
A/THR..OFF

- **If at least two AOA probe heating are failed:**
  PROBE WINDOW HEAT..ON

BKUP SPD/ALT..USE
ADR 1+2+3 P/B..OFF

L2 *Note: The STALL WARNING remains operative.*

L1 SPD..FLY THE GREEN

L2 *Fly the green area of the speed scale to ensure safe flight.*

L1 *Note: If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust table.*

- **if AOA disagree:**
  BKUP SPD/ALT..DO NOT USE

STBY INST..MAY BE UNREL

L2 *ADR3 and STBY speeds use the data of the same probes. Therefore, standby instrument must be used with care.*

L1 MAX FL..REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

- **If at least one AOA probe heating is failed:**
  AVOID ICING CONDITIONS

ALL ADR OFF PROC..APPLY

L2 *Refer to PRO-ABN-NAV [QRH] ALL ADR OFF.*

Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

USE RUDDER WITH CARE

L2 *The rudder travel limit is frozen at the value it had at the moment when the failure occurred, and may not be in correct position for the flight speed. At slats extension, full rudder travel authority may be recovered.*

L1 SPD BRK.......................................DO NOT USE

Ident.: PRO-ABN-NAV-R-00018104.0007001 / 12 JUL 18

L12

STATUS

STBY INST.......................MAY BE UNREL

- **For aircraft equipped with GA SOFT :**

  GA THR: TOGA ONLY

SPD BRK.......................DO NOT USE

USE RUDDER WITH CARE

AVOID ICING CONDITIONS

APPR PROC

FOR LDG.......................USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.......................APPLY

ALTN LAW: PROT LOST

INOP SYS

ADR 1+2+3
F/CTL PROT
CAB PR 1+2
RUD TRV LIM
AP 1+2
A/THR
GPWS
GPWS TERR
TCAS
See (1)
REAC W/S DET
PRED W/S DET
ATC/XPDR 1
ATC/XPDR 2
GA SOFT

(1) *Note:* *Upon a triple ADR failure, the TCAS becomes inoperative. However, TCAS is displayed in the INOP SYS list depending on the TCAS manufacturer.*

NAV ADR 1+2+3 FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

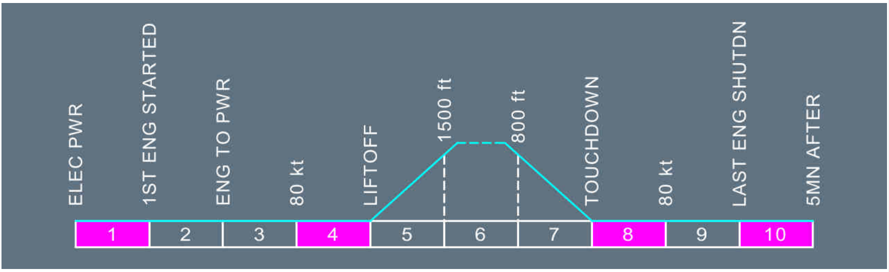
Ident.: PRO-ABN-NAV-R-00018484.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the three ADRs are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-R-00018103.0001001 / 08 NOV 21

L2 This alert triggers if each of the 3 ADRs self-detects a failure or receives irrelevant data from the probes. This procedure requires that the flight crew set the 3 ADRs to OFF to replace the PFD’s normal speed scale and altitude indication by the backup speed scale and GPS altitude indication.

Note: *In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

L1 AP+FD.. OFF
A/THR.. OFF

- **If at least two AOA probe heating are failed:**
  PROBE WINDOW HEAT..ON

ADR 1+2+3 P/B..OFF

L2 *Note:* *The STALL WARNING remains operative.*

L1 SPD.. FLY THE GREEN

L2 *Fly the green area of the speed scale to ensure safe flight.*

L1 *Note:* *If the BUSS does not react to longitudinal stick input when flying the green area of the speed scale, the flight crew must disregard the BUSS and use pitch/thrust table.*

STBY INST..MAY BE UNREL

L2 *ADR3 and STBY speeds use the data of the same probes. Therefore, standby instrument must be used with care.*

L1
- **If at least one AOA probe heating is failed:**
  AVOID ICING CONDITIONS

ALL ADR OFF PROC..APPLY

L2 *Refer to PRO-ABN-NAV [QRH] ALL ADR OFF.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
USE RUDDER WITH CARE

Continued on the following page

NAV ADR 1+2+3 FAULT (Cont'd)

L2 Note: *The rudder travel limit is frozen at the value it had at the moment when the failure occurred, and may not be in correct position for the flight speed. At slats extension, full rudder travel authority may be recovered.*

L1 SPD BRK...DO NOT USE

Ident.: PRO-ABN-NAV-R-00018104.0001001 / 12 JUL 18

L12

STATUS

STBY INST.................................... MAY BE UNREL

- **For aircraft equipped with GA SOFT ◁ :**
  GA THR: TOGA ONLY

SPD BRK...DO NOT USE
USE RUDDER WITH CARE
AVOID ICING CONDITIONS

ALTN LAW: PROT LOST

INOP SYS

ADR 1+2+3
F/CTL PROT
CAB PR 1+2
RUD TRV LIM
AP 1+2
A/THR
GPWS
GPWS TERR ◁
TCAS
See (1)
REAC W/S DET
PRED W/S DET ◁
ATC/XPDR 1
ATC/XPDR 2
GA SOFT ◁

(1) Note: *Upon a triple ADR failure, the TCAS becomes inoperative. However, TCAS is displayed in the INOP SYS list depending on the TCAS manufacturer.*

NAV ADR DISAGREE

Applicable to: LV-FVH, LV-GKO

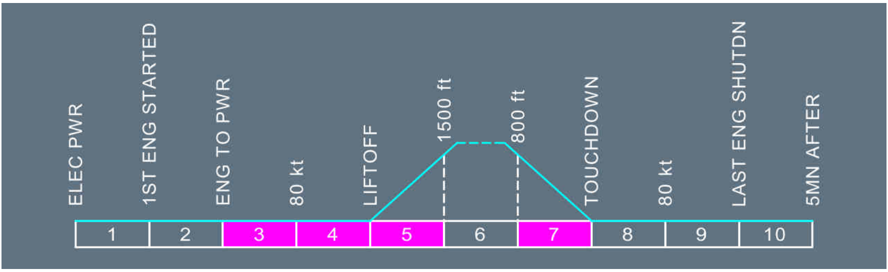
Ident.: PRO-ABN-NAV-P-00018485.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the following conditions occur:
- The PRIMs rejected an ADR, or an ADR is set to OFF
- The information received from the two remaining ADRs is different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017905.0008001 / 10 MAY 21

MAX FL.. REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

AIR SPD.. X CHECK

L2 *Check airspeed information on both PFDs, and on the standby airspeed indicator.*

L1 ■ **IF NO SPD DISAGREE:**

AOA DISCREPANCY

■ **IF SPD DISAGREE:**

UNREL SPD PROC.. APPLY

L2 *Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items.*

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Note: *Following NAV ADR DISAGREE, detected by the PRIMs, alternate law is latched.*

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

L1 MAX SPEED.. 330/.82

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017906.0014001 / 01 OCT 19

L12

STATUS

MAX SPEED.. 330/.82

RUD WITH CARE ABV 160 KT

See (1)

LDG DIST PROC.. APPLY

APPR PROC

FOR LDG... USE FLAP 3

ALTN LAW: PROT LOST

INOP SYS

RUD TRV LIM
CAT 2
F/CTL PROT

(1) *The rudder travel limit value is frozen at the moment when the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. At slats' extension, full rudder travel authority is recovered.*

NAV ADR DISAGREE

Applicable to: LV-GHQ, LV-GIF, LV-GKP

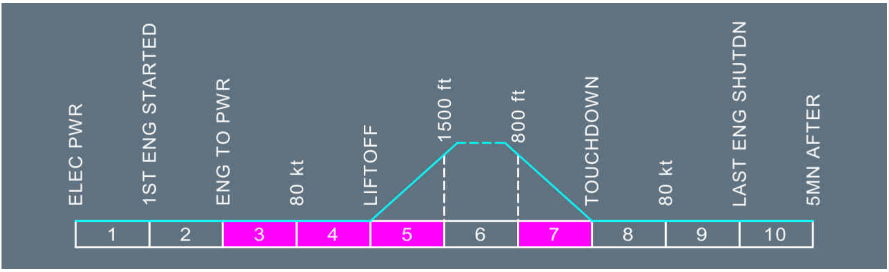
Ident.: PRO-ABN-NAV-P-00018485.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the following conditions occur:
- The PRIMs rejected an ADR, or an ADR is set to OFF
- The information received from the two remaining ADRs is different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017905.0007001 / 10 MAY 21

MAX FL.. REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

AIR SPD...X CHECK

L2 *Check airspeed information on both PFDs, and on the standby airspeed indicator.*

L1

- **IF NO SPD DISAGREE:**

  AOA DISCREPANCY
  BKUP SPD/ALT... DO NOT USE

- **IF SPD DISAGREE:**

  UNREL SPD PROC... APPLY

L2 *Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items.*

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Note: Following NAV ADR DISAGREE, detected by the PRIMs, alternate law is latched.

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

L1 MAX SPEED..330/.82

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017906.0014001 / 01 OCT 19

L12

STATUS

MAX SPEED.. 330/.82
RUD WITH CARE ABV 160 KT
See [(1)]

LDG DIST PROC.. APPLY

APPR PROC

FOR LDG... USE FLAP 3

ALTN LAW: PROT LOST

INOP SYS

RUD TRV LIM
CAT 2
F/CTL PROT

(1) The rudder travel limit value is frozen at the moment when the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. At slats' extension, full rudder travel authority is recovered.

NAV ADR DISAGREE

Applicable to: LV-FVI, LV-KAN, LV-KAO

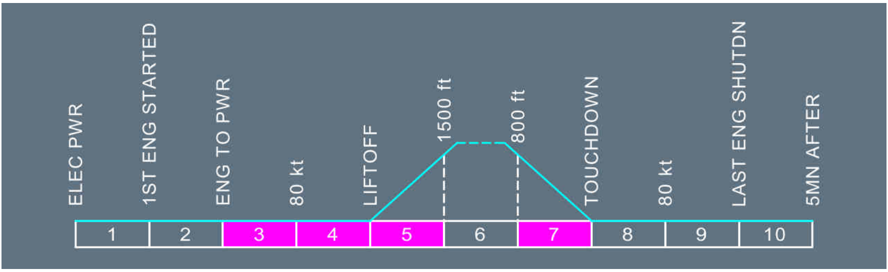
Ident.: PRO-ABN-NAV-P-00018485.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the following conditions occur:
- The PRIMs rejected an ADR, or an ADR is set to OFF
- The information received from the two remaining ADRs is different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017905.0001001 / 10 MAY 21

AIR SPD....................X CHECK

L2 *Check airspeed information on both PFDs, and on the standby airspeed indicator.*

L1 ■ **IF NO SPD DISAGREE:**

AOA DISCREPANCY

■ **IF SPD DISAGREE:**

ADR CHECK PROC....................APPLY

L2 *Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items.*

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Note: *Following NAV ADR DISAGREE, detected by the PRIMs, alternate law is latched.*

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

L1 MAX SPEED....................330/.82

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017906.0010001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/.82

APPR PROC:

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG : USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC.. APPLY

RISK OF UNDUE STALL WARN

Undue stall warnings may mainly occur, in case of an AOA discrepancy.

RUD WITH CARE ABV 160 KT

The rudder travel limit value is frozen at the moment when the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. At slats' extension, full rudder travel authority is recovered.

INOP SYS

RUD TRV LIM
CAT 2

NAV ADR DISAGREE

Applicable to: LV-KHT

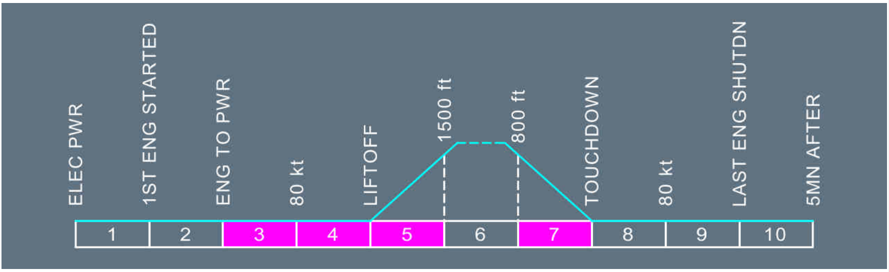
Ident.: PRO-ABN-NAV-P-00018485.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the following conditions occur:
- The PRIMs rejected an ADR, or an ADR is set to OFF
- The information received from the two remaining ADRs is different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017905.0008001 / 10 MAY 21

MAX FL.. REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

AIR SPD.. X CHECK

L2 *Check airspeed information on both PFDs, and on the standby airspeed indicator.*

L1 ■ **IF NO SPD DISAGREE:**

AOA DISCREPANCY

■ **IF SPD DISAGREE:**

UNREL SPD PROC.. APPLY

L2 *Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items.*

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

(PROT LOST)

Note: *Following NAV ADR DISAGREE, detected by the PRIMs, alternate law is latched.*

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

L1 MAX SPEED.. 330/.82

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017906.0013001 / 01 OCT 19

L12

STATUS

MAX SPEED.. 330/.82
RUD WITH CARE ABV 160 KT
See (1)

LDG DIST PROC.. APPLY

APPR PROC

FOR LDG... USE FLAP 3

CAT 3 SINGLE ONLY
ALTN LAW: PROT LOST

INOP SYS

RUD TRV LIM
CAT 3 DUAL
F/CTL PROT

(1) *The rudder travel limit value is frozen at the moment when the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. At slats' extension, full rudder travel authority is recovered.*

NAV ADR DISAGREE

Applicable to: LV-KHU

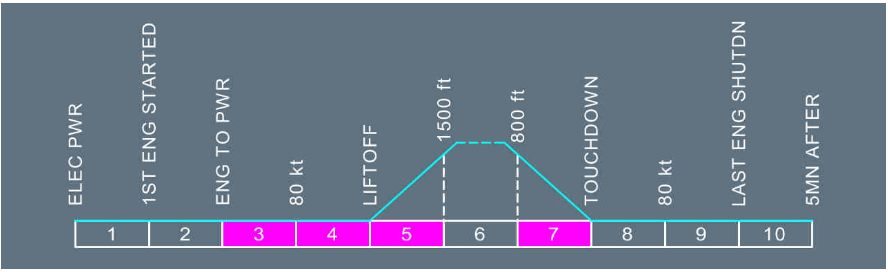
Ident.: PRO-ABN-NAV-P-00018485.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the following conditions occur:
- The PRIMs rejected an ADR, or an ADR is set to OFF
- The information received from the two remaining ADRs is different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017905.0001001 / 10 MAY 21

AIR SPD..X CHECK

L2 *Check airspeed information on both PFDs, and on the standby airspeed indicator.*

L1
- **IF NO SPD DISAGREE:**

  AOA DISCREPANCY

- **IF SPD DISAGREE:**

  ADR CHECK PROC..APPLY

L2 *Refer to PRO-ABN-NAV Unreliable Speed Indication - Memory Items.*

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Note: *Following NAV ADR DISAGREE, detected by the PRIMs, alternate law is latched.*

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

L1 MAX SPEED..330/.82

Continued on the following page

NAV ADR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-P-00017906.0008001 / 22 MAR 17

L12

STATUS

MAX SPEED... 330/.82

APPR PROC:

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG : USE FLAP 3" when CONF 3 is selected, as a reminder.

LDG DIST PROC... APPLY

CAT 3 SINGLE ONLY

RISK OF UNDUE STALL WARN

Undue stall warnings may mainly occur, in case of an AOA discrepancy.

RUD WITH CARE ABV 160 KT

The rudder travel limit value is frozen at the moment when the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt. At slats' extension, full rudder travel authority is recovered.

INOP SYS

RUD TRV LIM
CAT 3 DUAL

NAV ALT DISCREPANCY

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Ident.: PRO-ABN-NAV-MQ-00024425.0001001 / 02 NOV 20

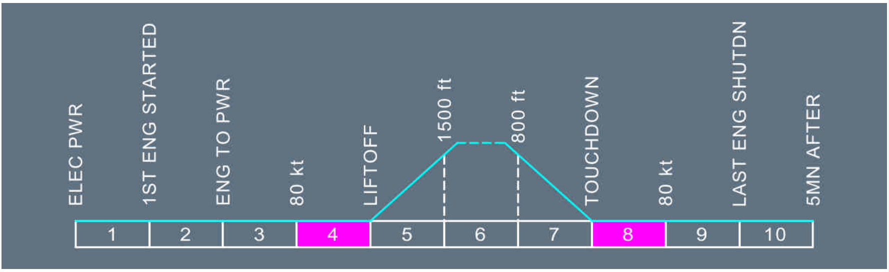
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the difference between the altitude displayed on the CAPT and F/O PFDs is greater than:

- 500 ft, if STD BARO reference is selected, or
- 250 ft, if QNH BARO reference is selected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
4
5
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7
8
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Ident.: PRO-ABN-NAV-MQ-00024426.0001001 / 02 NOV 20

L2 This alert is associated with CHEK ALT message on PFD.

L1 ALT.. X CHECK

L2 *Crosscheck with the standby altimeter.*

L1 AIR DATA SWTG.. AS RQRD

L2 *Select ADR 3 to the faulty side.*

NAV ALTI DISCREPANCY

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

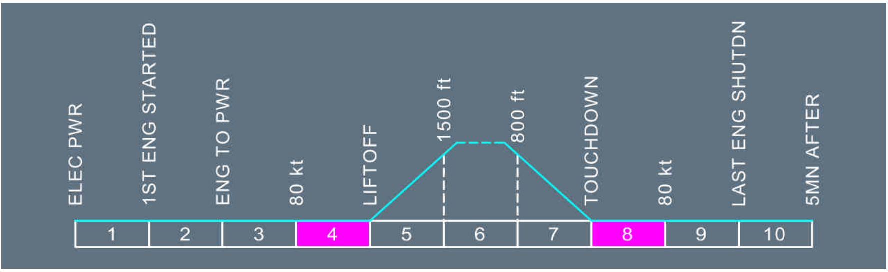
Ident.: PRO-ABN-NAV-AT-00018487.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the difference between the altitude displayed on the CAPT and F/O PFDs is greater than:
- 500 ft, if STD BARO reference is selected, or
- 250 ft, if QNH BARO reference is selected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AT-00011434.0001001 / 18 AUG 10

ALT.. X CHECK

L2 *Crosscheck with the standby altimeter.*

L1 AIR DATA SWTG... AS RQRD

L2 *Select ADR 3 to the faulty side.*

NAV AOA DISAGREE

Applicable to: LV-FVH, LV-GKO

Ident.: PRO-ABN-NAV-Q-00018488.0004001 / 21 MAR 16

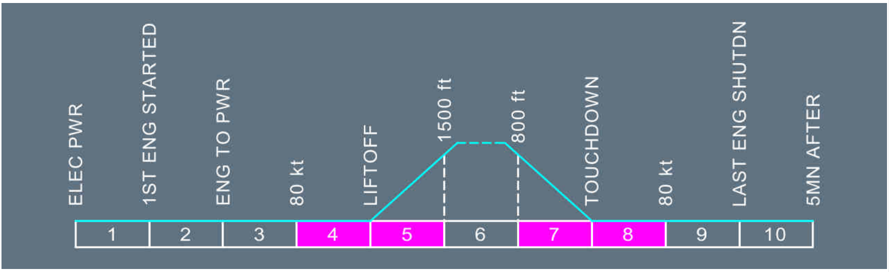
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a difference between the AOA information received from the two remaining ADRs, given that the third ADR is set to OFF or rejected by the PRIMs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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3
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Ident.: PRO-ABN-NAV-Q-00017907.0001001 / 02 NOV 20

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

MAX SPEED...330/.82

Continued on the following page

NAV AOA DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-Q-00017943.0013001 / 01 OCT 19

L12

STATUS

MAX SPEED.. 330/.82

RUD WITH CARE ABV 160 KT

The rudder travel limit value is frozen at the moment the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt . At slats' extension, full rudder travel authority is recovered.

ALTN LAW: PROT LOST

INOP SYS

RUD TRV LIM
CAT 2
F/CTL PROT

NAV AOA DISAGREE

Applicable to: LV-GHQ, LV-GIF, LV-GKP

Ident.: PRO-ABN-NAV-Q-00018488.0004001 / 21 MAR 16

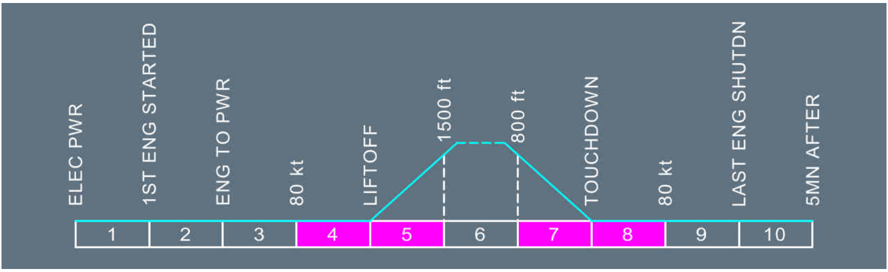
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a difference between the AOA information received from the two remaining ADRs, given that the third ADR is set to OFF or rejected by the PRIMs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Continued on the following page

NAV AOA DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-Q-00017907.0006001 / 06 JUN 17

L2 When the flight crew sets one ADR to OFF, or the PRIMs rejected one ADR without any prior caution, the PRIMs trigger the NAV AOA DISAGREE alert when the Angle-of-Attack (AOA) information provided by the remaining ADRs disagrees.

L1 BKUP SPD/ALT...DO NOT USE

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

MAX SPEED...330/.82

Ident.: PRO-ABN-NAV-Q-00017943.0013001 / 01 OCT 19

L12

STATUS

MAX SPEED..330/.82

RUD WITH CARE ABV 160 KT

The rudder travel limit value is frozen at the moment the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt . At slats' extension, full rudder travel authority is recovered.

ALTN LAW: PROT LOST

INOP SYS

RUD TRV LIM
CAT 2
F/CTL PROT

NAV AOA DISAGREE

Applicable to: LV-FVI, LV-KAN, LV-KAO

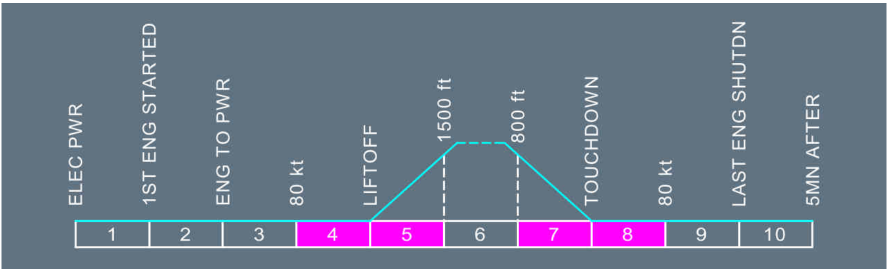
Ident.: PRO-ABN-NAV-Q-00018488.0004001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a difference between the AOA information received from the two remaining ADRs, given that the third ADR is set to OFF or rejected by the PRIMs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-NAV-Q-00017907.0001001 / 02 NOV 20

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

MAX SPEED..330/.82

Continued on the following page

NAV AOA DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-Q-00017943.0002001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/.82

RISK OF UNDUE STALL WARN
RUD WITH CARE ABV 160 KT

The rudder travel limit value is frozen at the moment the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt . At slats' extension, full rudder travel authority is recovered.

INOP SYS

RUD TRV LIM
CAT 2

NAV AOA DISAGREE

Applicable to: LV-KHT

Ident.: PRO-ABN-NAV-Q-00018488.0004001 / 21 MAR 16

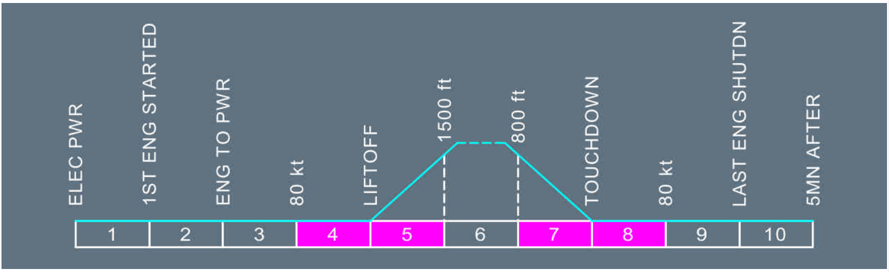
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when there is a difference between the AOA information received from the two remaining ADRs, given that the third ADR is set to OFF or rejected by the PRIMs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV AOA DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-Q-00017907.0001001 / 02 NOV 20

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

MAX SPEED..........330/.82

Ident.: PRO-ABN-NAV-Q-00017943.0011001 / 01 OCT 19

L12

STATUS

	INOP SYS
MAX SPEED..........330/.82	RUD TRV LIM CAT 3 DUAL F/CTL PROT
RUD WITH CARE ABV 160 KT *The rudder travel limit value is frozen at the moment the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt . At slats' extension, full rudder travel authority is recovered.*	
CAT 3 SINGLE ONLY ALTN LAW: PROT LOST	

NAV AOA DISAGREE

Applicable to: LV-KHU

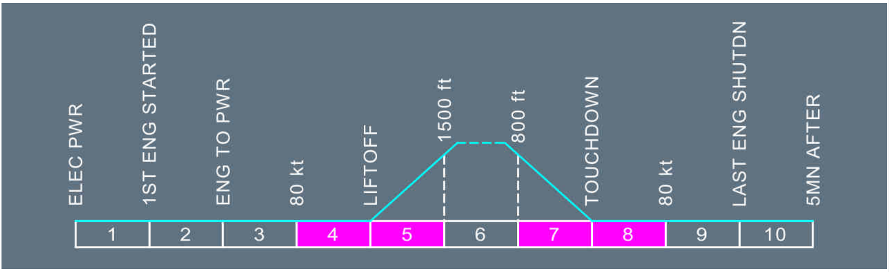
Ident.: PRO-ABN-NAV-Q-00018488.0004001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a difference between the AOA information received from the two remaining ADRs, given that the third ADR is set to OFF or rejected by the PRIMs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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5
6
7
8
9
10

Ident.: PRO-ABN-NAV-Q-00017907.0001001 / 02 NOV 20

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

MAX SPEED..330/.82

Continued on the following page

NAV AOA DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-Q-00017943.0001001 / 22 MAR 17

L12

STATUS

MAX SPEED.. 330/.82

CAT 3 SINGLE ONLY
RISK OF UNDUE STALL WARN
RUD WITH CARE ABV 160 KT

The rudder travel limit value is frozen at the moment the failure occurs. Therefore, to prevent damage to the aircraft structure, use the rudder with care, when the speed is above 160 kt . At slats' extension, full rudder travel authority is recovered.

INOP SYS

RUD TRV LIM
CAT 3 DUAL

NAV CAPT (F/O) (STBY) AOA FAULT

Applicable to: ALL

Ident.: PRO-ABN-NAV-AF-00018489.0001001 / 21 MAR 16

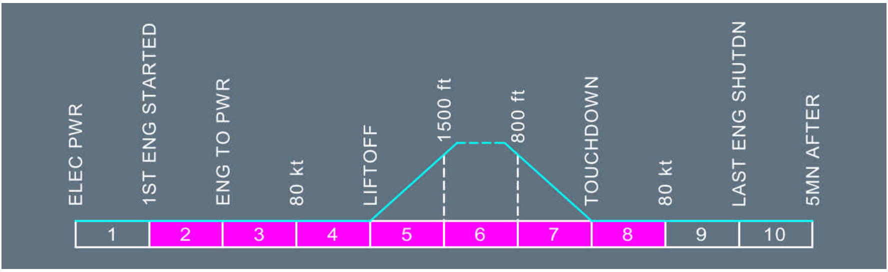
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when the CAPT(F/O)(STBY) Angle Of Attack (AOA) sensor is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV CAPT (F/O) (STBY) AOA FAULT (Cont'd)

Ident.: PRO-ABN-NAV-AF-00014976.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-AF-00014977.0001001 / 23 AUG 13

STATUS

INOP SYS

CAPT (F/O) (STBY) AOA

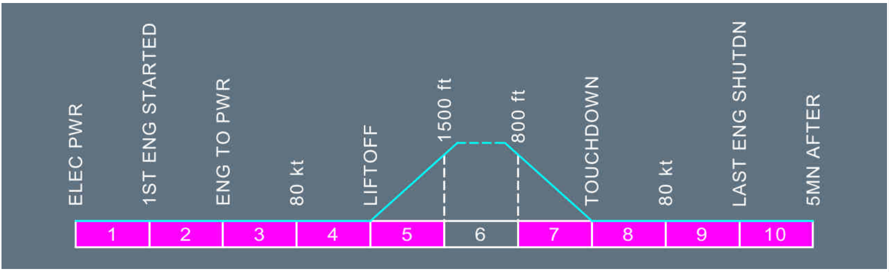
NAV ADS-B RPTG 1(2) FAULT

Applicable to: ALL

Ident.: PRO-ABN-NAV-AL-00018491.0006001 / 28 MAY 20

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-NAV-AL-00016151.0006001 / 09 MAR 15

ATC/XPDR.. SYS 2(1)

Continued on the following page

NAV ADS-B RPTG 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-AL-00016152.0006001 / 28 MAY 20

STATUS

INOP SYS

ADS-B RPTG 1(2)

NAV ATC/XPDR 1(2) FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

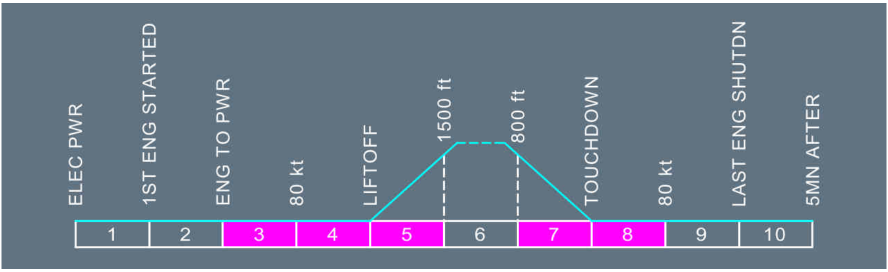
Ident.: PRO-ABN-NAV-X-00018492.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the related transponder fails.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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8
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Ident.: PRO-ABN-NAV-X-00017885.0004001 / 30 OCT 18

- **If the ATC/XPDR selector is set to SYS 1(2):**
  ATC/XPDR.. SYS 2(1)

Note: *In case of flight in RVSM airspace, select AP1 if SYS1 is used and AP2 if SYS2 is used.*

Continued on the following page

NAV ATC/XPDR 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-X-00017886.0002001 / 21 MAR 16

STATUS

INOP SYS

ATC/XPDR 1(2)
ADS–B RPTG 1(2)

NAV ATC/XPDR 1(2) FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

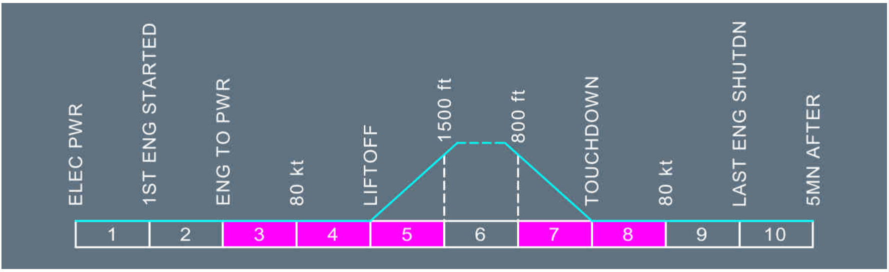
Ident.: PRO-ABN-NAV-X-00018492.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the related transponder fails.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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3
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5
6
7
8
9
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Ident.: PRO-ABN-NAV-X-00017885.0001001 / 18 JAN 17

ATC/XPDR..SYS 2(1)

Note: *In case of flight in RVSM airspace, select AP1 if SYS1 is used and AP2 if SYS2 is used.*

Continued on the following page

NAV ATC/XPDR 1(2) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-X-00017886.0002001 / 21 MAR 16

STATUS

INOP SYS

ATC/XPDR 1(2)
ADS–B RPTG 1(2)

NAV ATC/XPDR 1+2 FAULT

Applicable to: ALL

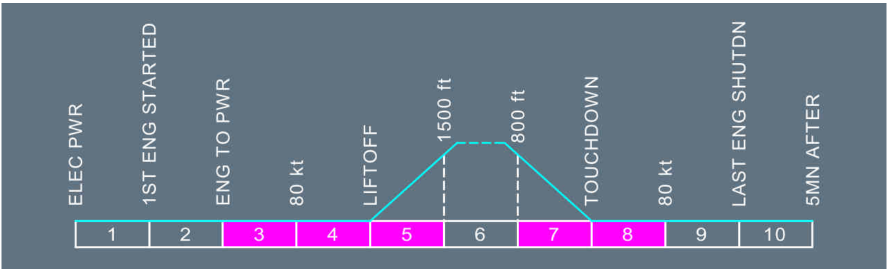
Ident.: PRO-ABN-NAV-Y-00018493.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when both transponders fail.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-NAV-Y-00017887.0001001 / 21 MAR 16

Crew awareness.

Continued on the following page

NAV ATC/XPDR 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-Y-00017889.0002001 / 21 MAR 16

STATUS

INOP SYS

TCAS
ATC/XPDR 1
ATC/XPDR 2
ADS-B RPTG 1
ADS-B RPTG 2

NAV ATC/XPDR STBY

Applicable to: ALL

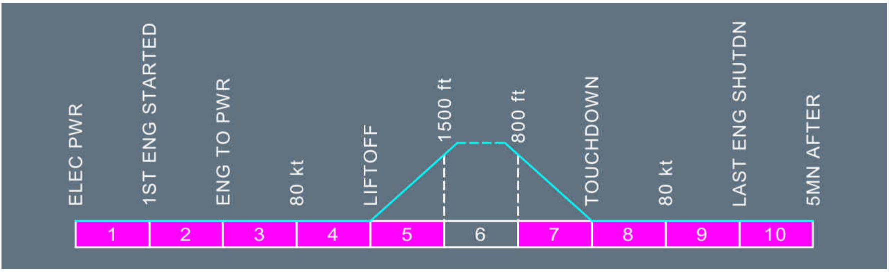
Ident.: PRO-ABN-NAV-AM-00018494.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the flight crew sets the ATC transponder on STBY in flight

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-NAV-AM-00017890.0001001 / 21 MAR 16

Crew awareness.

NAV ATT DISCREPANCY

Applicable to: ALL

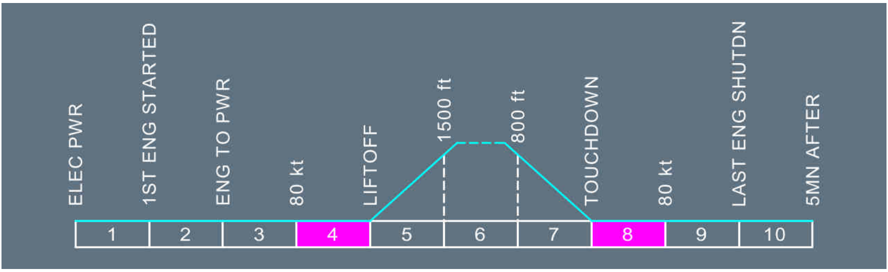
Ident.: PRO-ABN-NAV-AU-00018495.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the difference between the roll or pitch angle displayed on the CAPT and F/O PFD is greater than 5 °.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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5
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Ident.: PRO-ABN-NAV-AU-00011433.0001001 / 18 AUG 10

ATT..X CHECK

L2 *Crosscheck with the standby horizon.*

L1 ATT HDG SWTG..AS RQRD

L2 *Select IR 3 to the faulty side.*

NAV BARO REF DISCREPANCY

Applicable to: ALL

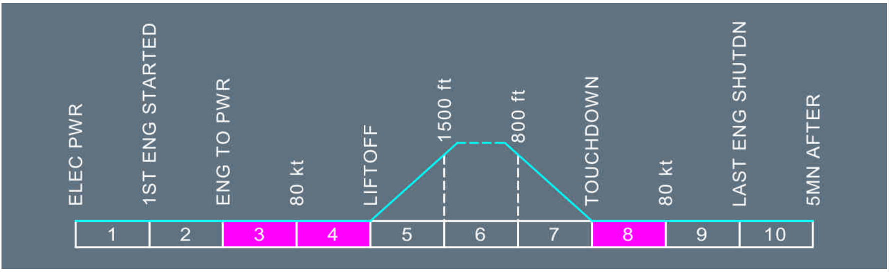
Ident.: PRO-ABN-NAV-AV-00018496.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a difference between the barometer reference selections on the FCU control panels.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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5
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Ident.: PRO-ABN-NAV-AV-00019424.0001001 / 21 MAR 16

BARO REF..X CHECK

NAV BARO VALUE DISAGREE

Applicable to: ALL

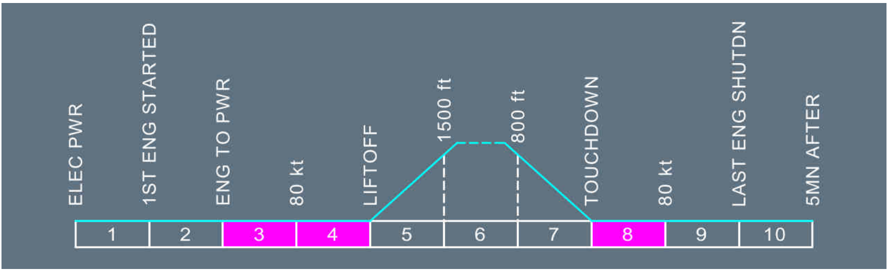
Ident.: PRO-ABN-NAV-AW-00018497.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a difference between the barometer value selections on the FCU control panels.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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3
4
5
6
7
8
9
10

Ident.: PRO-ABN-NAV-AW-00019425.0001001 / 21 MAR 16

BARO REF VALUE...X CHECK

NAV BKUP SPD/ALT ON CAPT(F/O) PFD

Applicable to: LV-GHQ, LV-GIF, LV-GKP

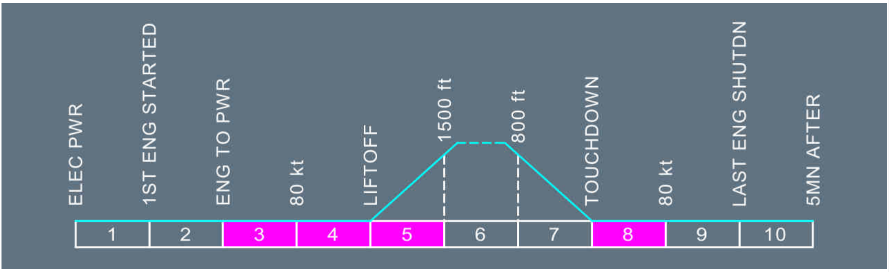
Ident.: PRO-ABN-NAV-AK-00019406.0001001 / 17 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BKUP SPD/ALT is activated on the CAPT PFD or on the F/O PFD and the AP and/or FD of the same side is engaged.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AK-00019407.0001001 / 17 MAR 16

AP1(2)..DO NOT USE
FD1(2)..DO NOT USE

NAV BKUP SPD/ALT ON CAPT+F/O PFD

Applicable to: LV-GHQ, LV-GIF, LV-GKP

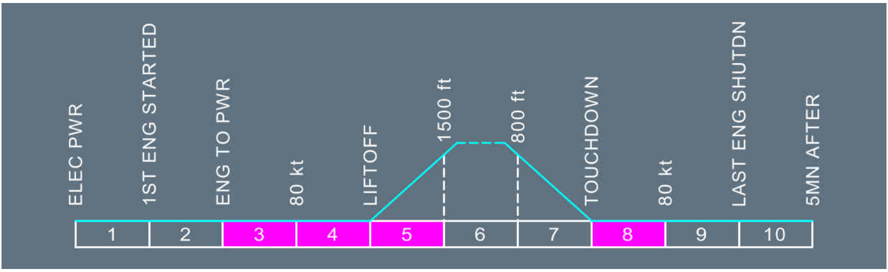
Ident.: PRO-ABN-NAV-AJ-00019403.0001001 / 17 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the BKUP SPD/ALT is activated on CAPT and F/O PFDs at the same time.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AJ-00019404.0002001 / 01 OCT 19

- **If all airspeeds unreliable:**
  UNREL SPD PROC.. APPLY
- **If at least one airspeed reliable:**
  RELIABLE AIR DATA..USE

NAV EXTREME LATITUDE

Applicable to: ALL

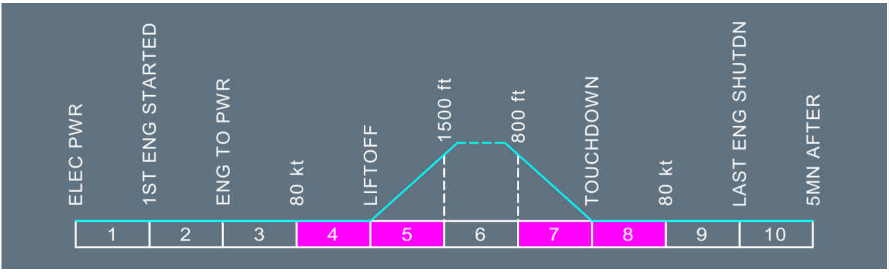
Ident.: PRO-ABN-NAV-AO-00018498.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the aircraft enters a polar area.
The crew must select true heading reference.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
2
3
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8
9
10

Ident.: PRO-ABN-NAV-AO-00017945.0001001 / 21 MAR 16

NORTH REF SEL..TRUE

L2 *The magnetic heading is replaced by the true heading on EFIS and DDRMI* ⩤ .

NAV FM/GPS POS DISAGREE ⩤

Applicable to: ALL

Ident.: PRO-ABN-NAV-AP-00018863.0002001 / 02 APR 19

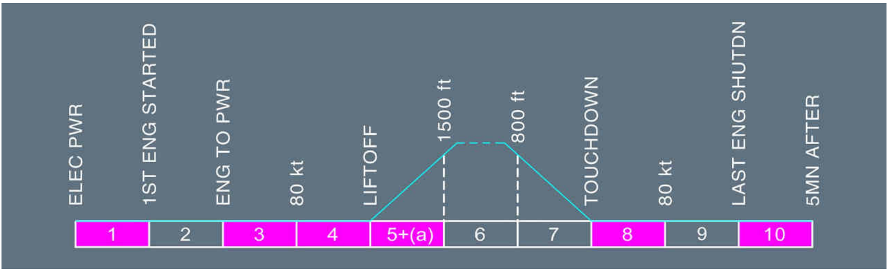
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FMS and GPS positions differ by more than:

- A longitude threshold that depends on the latitude:
  - 0.5 min between 45 °N and 45 °S
  - 0.7 min between latitudes 45 ° and 60 °
  - 1 min between latitudes 60 ° and 70 °.
- A latitude threshold of 0.5 min anywhere.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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5+(a)
6
7
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9
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Note: (a) Inhibited during the first 15 s of FLIGHT PHASE 5.

Continued on the following page

NAV FM/GPS POS DISAGREE ⩤ (Cont'd)

Ident.: PRO-ABN-NAV-AP-00017947.0002001 / 09 FEB 18

A/C POS..CHECK

The following procedure is not displayed on the ECAM:

- **During climb, cruise, or descent:**

  Check accuracy on the MCDU PROG page:

  FMS PROG page..SELECT

  - **If ESTIMATED ACCUR below REQUIRED ACCUR:**

    CONSIDER NAV MODE AND ND ARC/ROSE NAV

  - **If ESTIMATED ACCUR above REQUIRED ACCUR:**

    HDG/TRK MODE..SELECT

    USE RAW DATA

  When possible, compare the positions of both FMs with the GPIRS position, on the MCDU POSITION MONITOR page:

  FMS POSITION MONITOR page..SELECT

  - **If one FM position agrees with onside GPIRS position:**

    USE ASSOCIATED AP/FD

  - **If both FM positions DO NOT agree with onside GPIRS position:**

    GPS.. DESELECT

    USE RAW DATA

- **During ILS/LOC/GLS approach:**

  NAV MODE: DO NOT USE

  CONTINUE APPROACH

- **During LOC only approach with FLS ⩤ :**

  NAV MODE: DO NOT USE

  DISREGARD F-G/S DEVIATION

  REVERT TO VERTICAL SELECTED MODE

- **During RNAV GNSS, or RNAV RNP approach:**

  - **If visual references not sufficient:** GO AROUND

Continued on the following page

NAV FM/GPS POS DISAGREE ◁ (Cont'd)

■ **During VOR, VOR-DME, NDB, or NDB-DME approach:**

HDG/TRK MODE.. SELECT

USE RAW DATA

- **If FLS ◁ used:**

  LS pb.. PRESS

  FLS deviations are removed from PFD.

NAV FM/IR POS DISAGREE

Applicable to: ALL

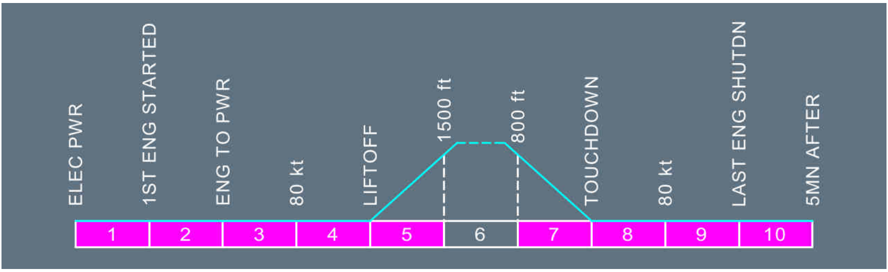
Ident.: PRO-ABN-NAV-AX-00018500.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a significant drift is detected between any of the FMS positions and any of the IRS positions.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AX-00019426.0001001 / 21 MAR 16

A/C POS..CHECK

L2 *Use the MCDU's POSITION and IRS MONITOR pages. For flight continuation, consider periodic NAV ACCURACY check.*

NAV GPS 1 (2) FAULT

Applicable to: ALL

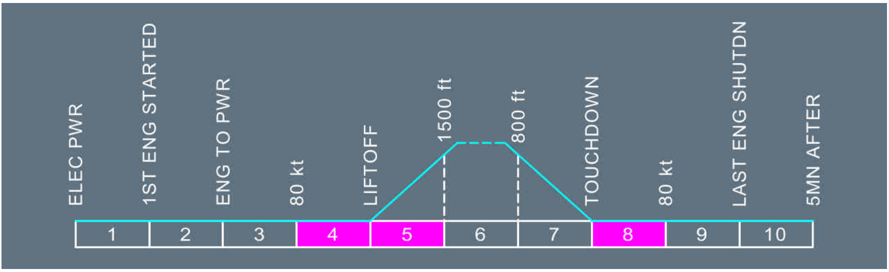
Ident.: PRO-ABN-NAV-L-00018503.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the GPS 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-L-00019299.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-L-00019298.0001001 / 21 MAR 16

STATUS

- **If both GPS FAULT**
  FLS LIMITED TO F-APP + RAW

INOP SYS

GPS 1(2)

NAV GPWS FAULT

Applicable to: ALL

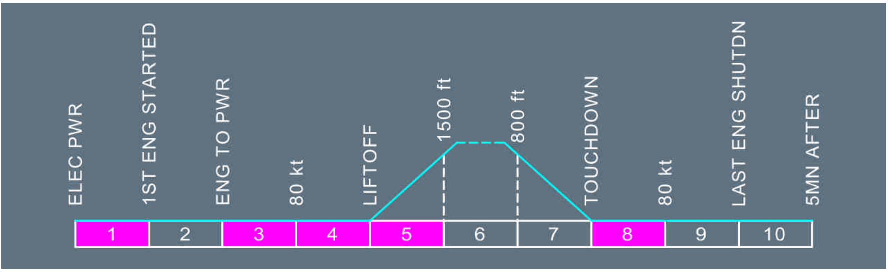
Ident.: PRO-ABN-NAV-I-00018504.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the GPWS fails.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-I-00011449.0002001 / 18 MAR 11

GPWS SYS.. OFF

L2 *This line stays on the ECAM after action.*

Ident.: PRO-ABN-NAV-I-00011450.0001001 / 18 AUG 10

STATUS

INOP SYS

GPWS

NAV GPWS TERR DET FAULT

Applicable to: ALL

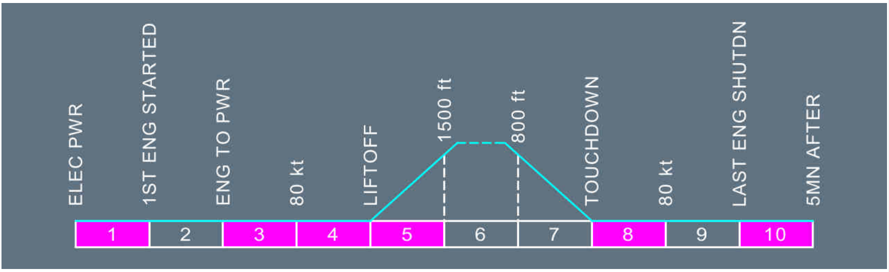
Ident.: PRO-ABN-NAV-N-00018532.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the enhanced Terrain Clearance Floor and Terrain Awareness Display modes of the EGPWS are inoperative.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-N-00019371.0001001 / 21 MAR 16

GPWS TERR...OFF

L2 *The basic GPWS Modes 1 to 5 are still operative, if the SYS pb FAULT or OFF lights are not on.*

Ident.: PRO-ABN-NAV-N-00011463.0001001 / 18 AUG 10

STATUS

INOP SYS

GPWS TERR

NAV HDG DISCREPANCY

Applicable to: ALL

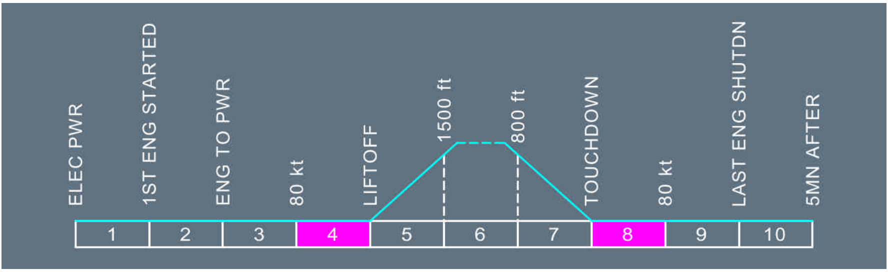
Ident.: PRO-ABN-NAV-AY-00018506.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the difference between the heading on the CAPT and F/O displays is greater than 5 ° in TRUE, or greater than 7 ° in MAG.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AY-00011432.0001001 / 18 AUG 10

HDG..X CHECK

L2 *Compare the 3 IR headings on the MCDU page, or crosscheck with the standby compass.*

L1 ATT HDG SWTG..AS RQRD

L2 *Select IR 3 to the faulty side.*

NAV IAS DISCREPANCY

Applicable to: ALL

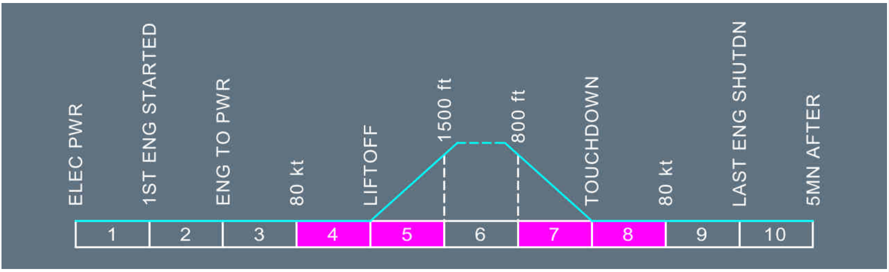
Ident.: PRO-ABN-NAV-G-00018507.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a discrepancy between the speeds displayed on the PFDs.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-G-00017953.0001001 / 21 MAR 16

AIR SPD...X CHECK
AIR DATA SWTG...AS RQRD

Ident.: PRO-ABN-NAV-G-00017955.0001001 / 21 MAR 16

STATUS

	INOP SYS
CAT 3 SINGLE ONLY	CAT 3 DUAL

NAV ILS 1(2)(1+2) FAULT

Applicable to: ALL

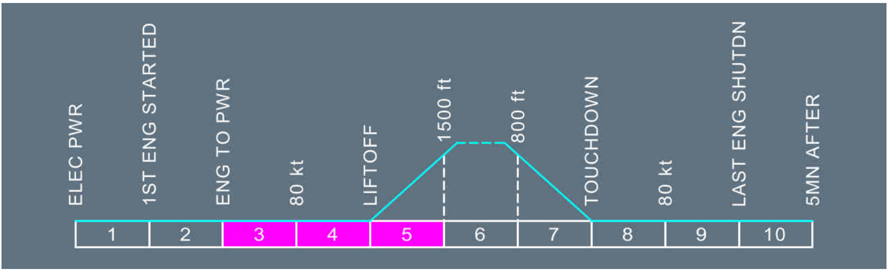
Ident.: PRO-ABN-NAV-H-00018508.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The alert triggers when the ILS 1(2)(1+2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-H-00017961.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-H-00017957.0001001 / 21 MAR 16

STATUS

INOP SYS

ILS 1(2)(1+2)
CAT 2 (1)
GPWS G/S (2)
AP 1+2 (in APPR)

(1) *(If ILS 1(2) FAULT)*
(2) *(if ILS 1 FAULT on ground or ILS 1+2 FAULT)*

NAV IR 1(2)(3) FAULT

Applicable to: ALL

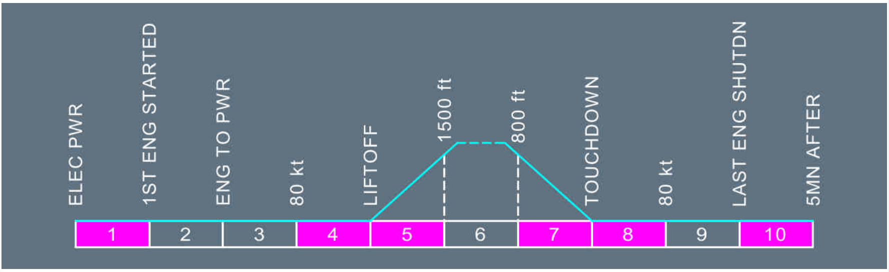
Ident.: PRO-ABN-NAV-D-00018510.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The alert triggers when the IR 1(2)(3) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-D-00017980.0002001 / 04 NOV 20

L2 Note: *In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

L1 ATT HDG SWTG....................CAPT ON 3 (F/O ON 3) (NORM)

L2 *Select IR 3 to the affected side.*

L1 ATC/XPDR (IF IR 1 FAILED).................... SYS 2

ATC/XPDR (IF IR 2 FAILED).................... SYS 1

- **If IR available in ATT mode:**

  IR (AFFECTED) MODE SEL.................... ATT

  L2 *For IR alignment in ATT mode: Refer to PRO-ABN-NAV [QRH] IR ALIGNMENT IN ATT MODE.*

L1
- **If IR totally faulty:**

  IR (AFFECTED) P/B....................OFF

  L2 *Set the IR pb to OFF.*

Continued on the following page

NAV IR 1(2)(3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-D-00017981.0001001 / 21 MAR 16

L12

STATUS

CAT 3 SINGLE ONLY

INOP SYS

IR 1 (2) (3)
CAT 3 DUAL
GPWS TERR (1)
ATC/XPDR 1 (If IR1 fault)
ATC/XPDR 2 (If IR2 fault)
TCAS
See (2)

(1) *(For aircraft equipped with EGPWS ◁ or T2CAS ◁ , if IR1 fault)*

(2) *Note: In case of an IR 1 fault, the TCAS may be inoperative (depending on the TCAS manufacturer). If the IR 1 is available in ATT mode, the TCAS can be recovered by entering the aircraft magnetic heading into the CDU, as per IR ALIGNMENT IN ATT MODE procedure (Refer to PRO-ABN-NAV [QRH] IR ALIGNMENT IN ATT MODE).*

NAV IR 1+2(1+3)(2+3) FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

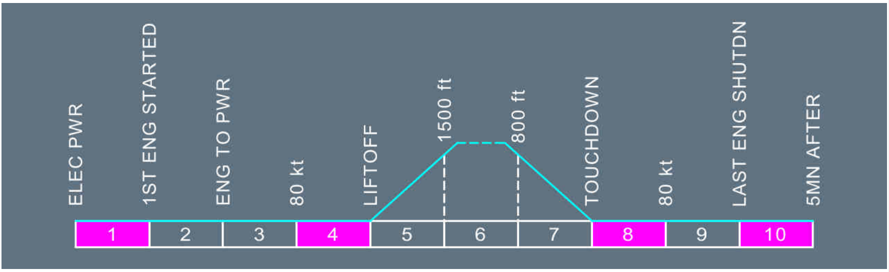
Ident.: PRO-ABN-NAV-E-00018511.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The alert trigger when the IR 1+2(1+3)(2+3) are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-E-00018007.0013001 / 10 SEP 19

L2 *Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

L1 ATT HDG SWTG.......................................CAPT ON 3 (NORM) (NORM)
ATC/XPDR (IF IR 1+3 FAULT).......................................SYS 2
ATC/XPDR (IF IR 2+3 FAULT).......................................SYS 1

- **If IR (affected) available in ATT mode:**
  IR (AFFECTED) MODE SEL.......................................ATT
- **If IR (affected) totally faulty:**
  IR (AFFECTED) P/B.......................................OFF

L2 *Note: The crewmember on the affected side can recover IR information, by using the EFIS DMC rotary selector (copy of the opposite side).*

L1 SPD BRK.......................................DO NOT USE
MAX FL.......................................REFER TO THE TABLE BELOW

Weight	160 t / 353 klb	180 t / 397 klb	200 t / 441 klb	220 t / 485 klb	230 t / 507 klb	240 t / 529 klb
Max FL	FL 415	FL 380	FL 350	FL 330	FL 320	FL 310

- **If the trim tank pumps are operative:**
  - **IF CG AFT 32 %:**
    T TANK MODE.......................................FWD

    L2 *Fuel consumption is increased by approximately 1 %.*

L1
- **If the trim tank pumps are inoperative, or not installed:**
  - **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**
    T TANK MODE.......................................FWD

    L2 *Fuel consumption is increased by approximately 1 %.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED.......................................330/.82

Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-E-00018016.0008001 / 03 DEC 19

L12

STATUS

SPD BRK..DO NOT USE
MAX FL.. 300

The MAX FL is displayed depending on the aircraft weight.

APPR PROC:

FOR LDG.. USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- **If the trim tank pump is operative:**
  - **IF CG AFT 32 %:**

    T TANK MODE...FWD

    Fuel consumption is increased by approximately 1 %.
- **If the trim tank pump is inoperative, or not installed:**
  - **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**

    T TANK MODE...FWD

    Fuel consumption is increased by approximately 1 %.

LDG DIST PROC.. APPLY

ALTN LAW: PROT LOST
FLS ◁ : F-APP + RAW ONLY
APPR 1 ONLY

INOP SYS

F/CTL PROT
IR 1+2(1+3)(2+3)
AP 1+2
A/THR
GPWS TERR (1)
TCAS
See (2)
ATC/XPDR 1 (3)
ATC/XPDR 2 (4)
AUTOLAND

(1) *(For aircraft equipped with EGPWS ◁ or T2CAS ◁, if IR1 fault)*

(2) Note: *In case of an IR 1 fault, the TCAS may be inoperative (depending on the TCAS manufacturer). If the IR 1 is available in ATT mode, the TCAS can be recovered by entering the aircraft magnetic heading into the CDU, as per the IR ALIGNMENT IN ATT MODE procedure (Refer to PRO-ABN-NAV [QRH] IR ALIGNMENT IN ATT MODE).*

(3) *(If IR 1 + 3 FAULT)*

Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

(4) *(If IR 1 + 2 or 2 + 3 FAULT)*

NAV IR 1+2(1+3)(2+3) FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

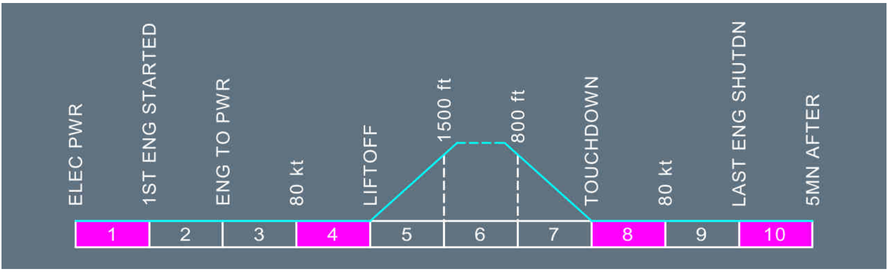
Ident.: PRO-ABN-NAV-E-00018511.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 The alert trigger when the IR 1+2(1+3)(2+3) are failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-E-00018007.0002001 / 22 MAR 17

L2 *Note: In case of a simultaneous ADR and IR (same ADIRU) failure, apply the ADR FAULT procedure before the IR FAULT procedure.*

L1 ATT HDG SWTG.......................................CAPT ON 3 (NORM) (NORM)
ATC/XPDR (IF IR 1+3 FAULT)....................................SYS 2
ATC/XPDR (IF IR 2+3 FAULT)....................................SYS 1

- **If IR (affected) available in ATT mode:**
  IR (AFFECTED) MODE SEL....................................ATT
- **If IR (affected) totally faulty:**
  IR (AFFECTED) P/B....................................OFF

L2 *Note: The crewmember on the affected side can recover IR information, by using the EFIS DMC rotary selector (copy of the opposite side).*

L1 SPD BRK....................................DO NOT USE

- ■ **If the trim tank pumps are operative:**
  - **IF CG AFT 32 %:**
    T TANK MODE....................................FWD

L2 *Fuel consumption is increased by approximately 1 %.*

L1
- ■ **If the trim tank pumps are inoperative, or not installed:**
  - **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**
    T TANK MODE....................................FWD

L2 *Fuel consumption is increased by approximately 1 %.*

L1

ASSOCIATED PROCEDURES

F/CTL ALTN LAW
(PROT LOST)
MAX SPEED....................................330/.82

Continued on the following page

NAV IR 1+2(1+3)(2+3) FAULT (Cont'd)

Ident.: PRO-ABN-NAV-E-00018016.0001001 / 03 DEC 19

L12

STATUS

SPD BRK..........................DO NOT USE
MAX SPEED..........................330/.82

APPR PROC:

FOR LDG..........................USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

- ■ **If the trim tank pump is operative:**
  - ● **IF CG AFT 32 %:**

    T TANK MODE..........................FWD

    Fuel consumption is increased by approximately 1 %.
- ■ **If the trim tank pump is inoperative, or not installed:**
  - ● **IF CG AFT 32 % AND WHEN SPD > 270 KT AND NOT IN CLIMB:**

    T TANK MODE..........................FWD

    Fuel consumption is increased by approximately 1 %.

LDG DIST PROC..........................APPLY

ALTN LAW: PROT LOST
FLS ◁ : F-APP + RAW ONLY

INOP SYS

F/CTL PROT
IR 1+2(1+3)(2+3)
AP 1+2
A/THR
GPWS TERR (1)
TCAS
See (2)
ATC/XPDR 1 (3)
ATC/XPDR 2 (4)
CAT 2

(1) *(For aircraft equipped with EGPWS ◁ or T2CAS ◁ , if IR1 fault)*

(2) *Note:* *In case of an IR 1 fault, the TCAS may be inoperative (depending on the TCAS manufacturer). If the IR 1 is available in ATT mode, the TCAS can be recovered by entering the aircraft magnetic heading into the CDU, as per the IR ALIGNMENT IN ATT MODE procedure (Refer to PRO-ABN-NAV [QRH] IR ALIGNMENT IN ATT MODE).*

(3) *(If IR 1 + 3 FAULT)*

(4) *(If IR 1 + 2 or 2 + 3 FAULT)*

NAV IR DISAGREE

Applicable to: ALL

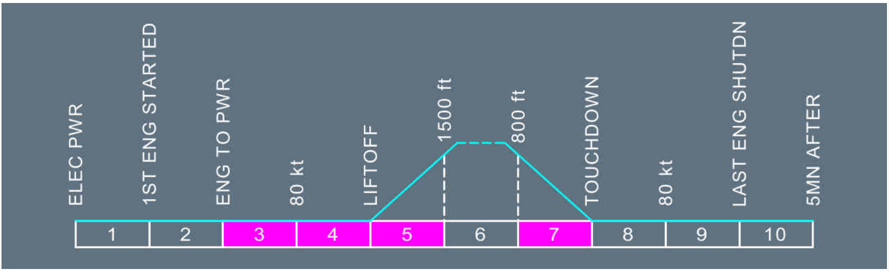
Ident.: PRO-ABN-NAV-AR-00018512.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when one IR is failed or rejected by the PRIM, and the information received from the two remaining IRs is different.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

NAV IR DISAGREE (Cont'd)

Ident.: PRO-ABN-NAV-AR-00018029.0001001 / 21 MAR 16

DIRECT LAW

L2 *Direct law becomes active. All pitch and roll protections are lost.*

L1 ATT...X CHECK

L2 *Use the standby horizon to determine the faulty IR.*

L1 ■ **IF DISAGREE CONFIRMED:**

FAULTY IR...OFF
PRIM 3...OFF THEN ON
PRIM 2...OFF THEN ON
PRIM 1...OFF THEN ON

L2 *After corrective action (the faulty IR is switched off and PRIMs are reset), pitch alternate law is recovered with reduced protections.*

L12

ASSOCIATED PROCEDURES

F/CTL ALTN LAW

Refer to PRO-ABN-F_CTL F/CTL ALTN LAW (PROT LOST).

L1 ■ **If disagree not confirmed (both IRs remain on):**

L12

ASSOCIATED PROCEDURES

F/CTL DIRECT LAW

Refer to PRO-ABN-F_CTL F/CTL DIRECT LAW (PROT LOST).

NAV IR NOT ALIGNED

Applicable to: ALL

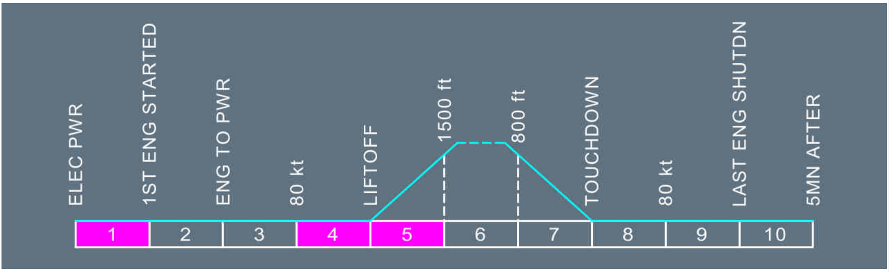
Ident.: PRO-ABN-NAV-AZ-00018513.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a problem is detected during IR alignment.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AZ-00011425.0001001 / 18 AUG 10

L2 This caution is available in Phase 2 (one engine running).

L1 POSITION MISMATCH
POSITION MISSING
PRESENT POSITION.. INSERT
EXCESS MOTION
IR 1(2)(3)(1+2)(2+3)(1+2+3) IN ALIGN

NAV LS TUNING DISAGREE

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Ident.: PRO-ABN-NAV-AB-00018530.0003001 / 22 MAR 17

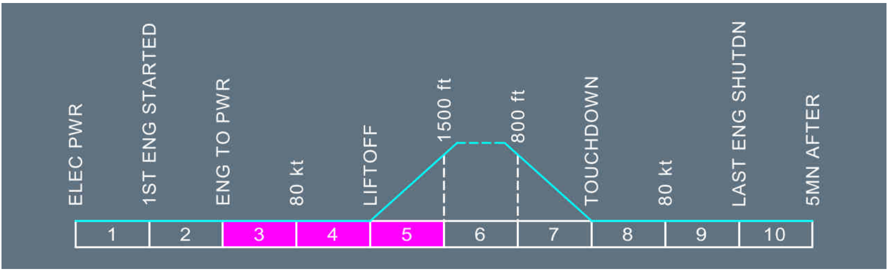
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FMGES detects a discrepancy between MMR1 and MMR2 on the landing system type, frequency, channel or course.
When the alert is triggered, the AP/FD:

- Inhibits APPR mode arming, or
- Disarms the APPR mode if already armed, or
- Reverts to basic AP/FD modes if APPR mode already engaged.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AB-00019432.0004001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-AB-00014724.0001001 / 27 AUG 14

STATUS

INOP SYS

CAT 2
GLS AUTOLAND

NAV L(R) CAPT(F/O) STATIC FAULT

Applicable to: ALL

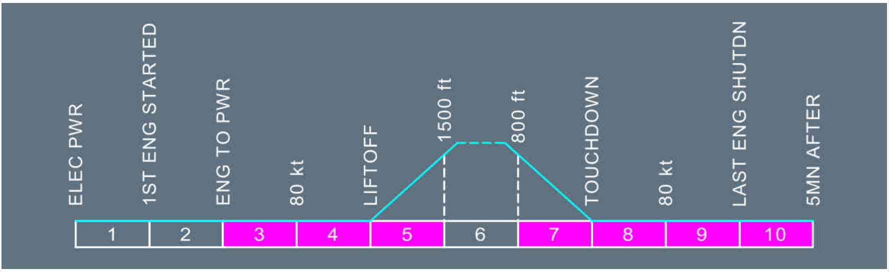
Ident.: PRO-ABN-NAV-T-00018515.0004001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the left(right) CAPT(F/O) static pressure probe is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-T-00011477.0004001 / 18 AUG 10

IAS/ALTI MAY BE UNREL

Ident.: PRO-ABN-NAV-T-00011478.0004001 / 18 AUG 10

STATUS

INOP SYS

L(R) CAPT(F/O) STAT

NAV PRED W/S DET FAULT

Applicable to: ALL

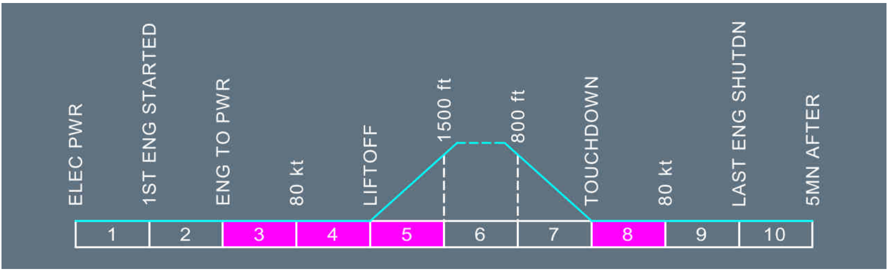
Ident.: PRO-ABN-NAV-M-00018517.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the predictive windshear function is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-M-00018777.0002001 / 21 MAR 16

WXR 1/2 SWTG.. CONSIDER

Ident.: PRO-ABN-NAV-M-00018778.0001001 / 21 MAR 16

STATUS

INOP SYS

PRED W/S DET

NAV RA 1(2) FAULT

Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

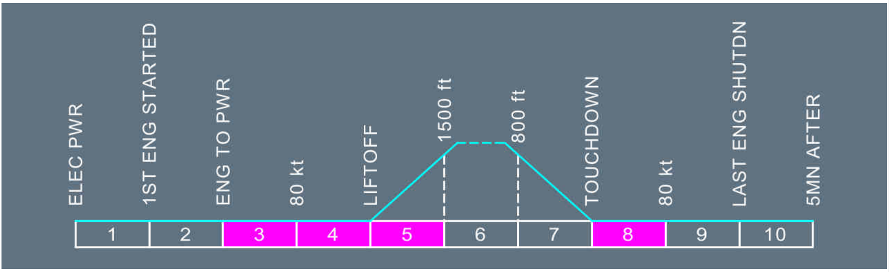
Ident.: PRO-ABN-NAV-F-00018518.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the RA 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-F-00011438.0003001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-F-00011439.0001001 / 21 NOV 11

STATUS

	INOP SYS
CAT 2 ONLY	CAT 3 GPWS (if RA 1 fault) RA 1(2)

NAV RA 1(2) FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

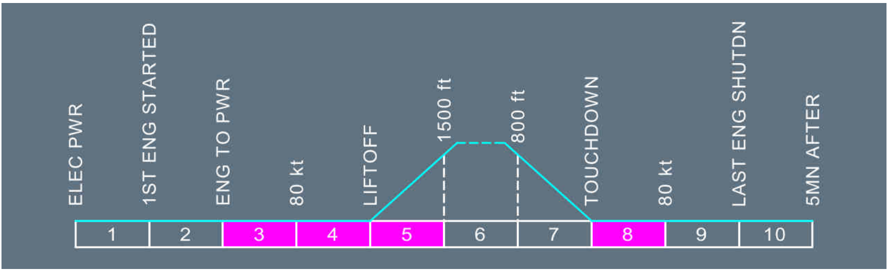
Ident.: PRO-ABN-NAV-F-00018518.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the RA 1(2) is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-F-00011438.0003001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-NAV-F-00011439.0003001 / 18 MAR 11

STATUS

CAT 2 ONLY

INOP SYS

CAT 3
RA 1(2)

NAV RA 1+2 FAULT

Applicable to: ALL

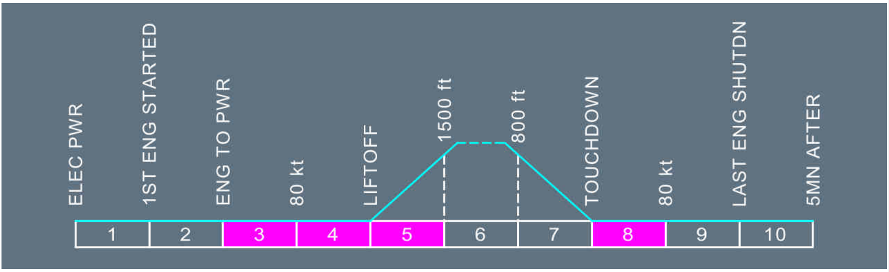
Ident.: PRO-ABN-NAV-V-00018519.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the RA 1+2 is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-V-00011440.0003001 / 25 FEB 14

Crew awareness.

Continued on the following page

NAV RA 1+2 FAULT (Cont'd)

Ident.: PRO-ABN-NAV-V-00011441.0006001 / 03 NOV 22

L12

STATUS

On the ECAM, only one of the following two statements is displayed, depending on the autopilot status.
Use manual pitch trim when flare law is active.

- **WHEN L/G DN:**
  MAN PITCH TRIM.. USE
  Provided the autopilot is off, switching to flare law occurs at landing gear extension.
- **WHEN L/G DN AND AP OFF:**
  MAN PITCH TRIM.. USE
  When the autopilot is engaged, and the landing gear is extended, switching to flare law occurs at autopilot disengagement.

ILS APPR mode cannot be engaged, LOC mode is available via the FCU LOC pb.

INOP SYS

RA 1+2
A/CALL OUT
CAT 2
GPWS
PRED W/S DET
TCAS
GLS AUTOLAND
REAC W/S DET

NAV RA DEGRADED

Applicable to: ALL

Ident.: PRO-ABN-NAV-BA-00018520.0001001 / 21 MAR 16

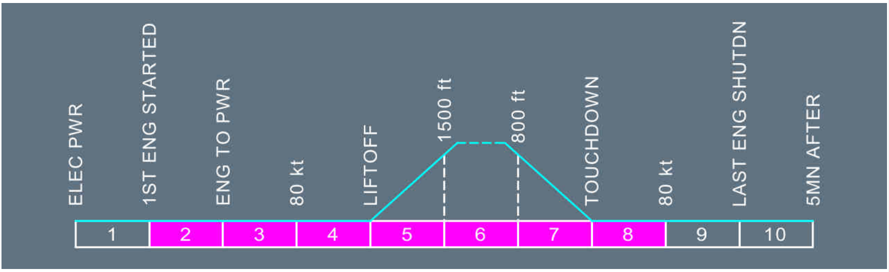
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers after landing when a discrepancy between the two radio altimeters is detected. Maintenance action is due.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-BA-00019436.0001001 / 21 MAR 16

Crew awareness.

NAV TCAS FAULT

Applicable to: ALL

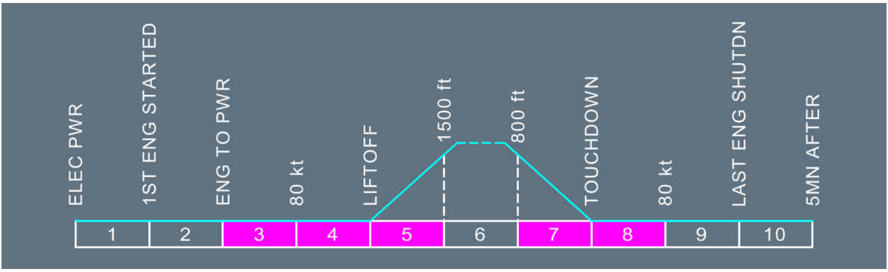
Ident.: PRO-ABN-NAV-K-00018865.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is an internal failure of the TCAS.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-K-00017891.0002001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-NAV-K-00017897.0001001 / 21 MAR 16

STATUS

INOP SYS

TCAS

NAV TCAS STBY

Applicable to: ALL

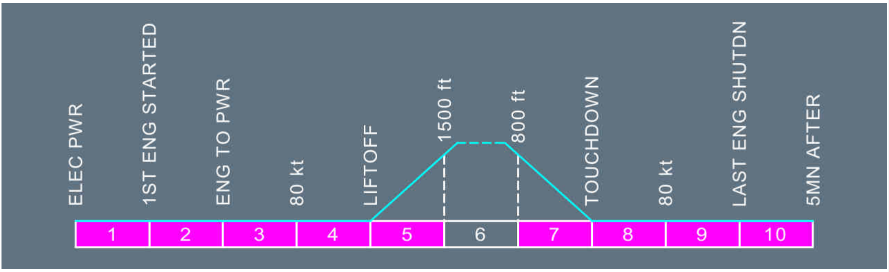
Ident.: PRO-ABN-NAV-AN-00018521.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the flight crew set the TCAS to STBY during flight.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-NAV-AN-00019372.0001001 / 21 MAR 16

Crew awareness.

STALL WARNING

Ident.: PRO-ABN-NAV-00011455.0001001 / 19 JUN 12
Applicable to: LV-KHT, LV-KHU

When the threshold is reached, a permanent aural alert (“STALL, STALL” synthetic voice then cricket) is triggered until a correct angle-of-attack is recovered *Refer to PRO-ABN-MISC [MEM] Stall Recovery* .

STALL WARNING

Ident.: PRO-ABN-NAV-00011455.0002001 / 09 OCT 14
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

When the threshold is reached, permanent aural and visual alerts (“STALL, STALL” synthetic voice then cricket, "STALL STALL" red message on PFD) are triggered until a correct angle-of-attack is recovered *Refer to PRO-ABN-MISC [MEM] Stall Recovery* .

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OVERSPEED

Applicable to: ALL

Ident.: PRO-ABN-OVERSPEED-AS-00018522.0001001 / 20 APR 17

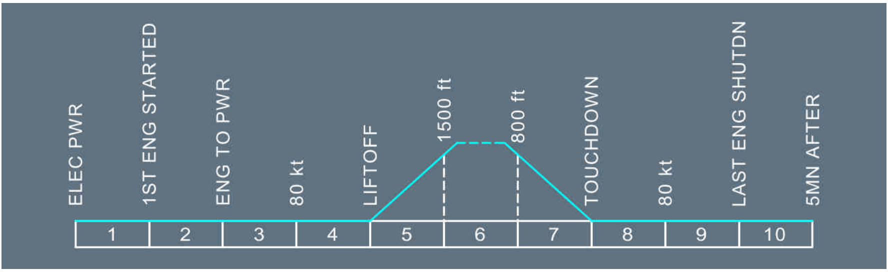
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- VMO/MMO aircraft speed/mach is greater than VMO + 4 kt/MMO + 0.006, or
- VLE aircraft speed is greater than VLE + 4 kt with L/G not uplocked or L/G doors not closed, or
- VFE aircraft speed is greater than VFE + 4 kt with slats or/and flaps extended.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-OVERSPEED-AS-00018038.0001001 / 21 MAR 16

VMO/MMO.. 330/.86

L2 *255/.60 in case of dispatch with landing gear down.*

L1 VLE.. 250/.55

VFE..SEE BELOW

CONF	*VFE*
FULL	*180*
3	*186*
2	*196*
*1**	*205*
1 + F	*215*
1	*240*

Intentionally left blank

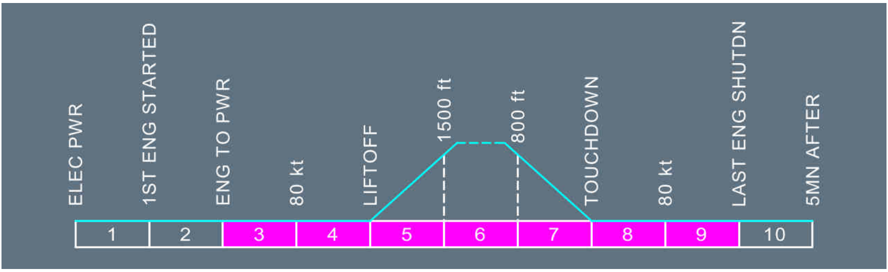
RECORDER CVR FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

Ident.: PRO-ABN-RECORDER-K-00017521.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-RECORDER-K-00014374.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-RECORDER-K-00014375.0001001 / 23 JUL 12

STATUS

INOP SYS

CVR

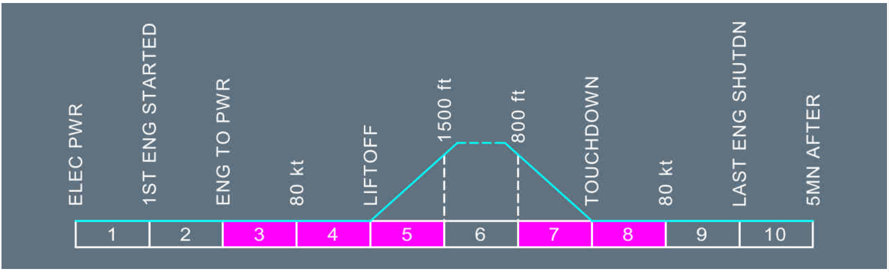
RECORDER DFDR FAULT

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

Ident.: PRO-ABN-RECORDER-A-00017522.0001001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-RECORDER-A-00010006.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-RECORDER-A-00010007.0001001 / 10 AUG 10

STATUS

INOP SYS

DFDR

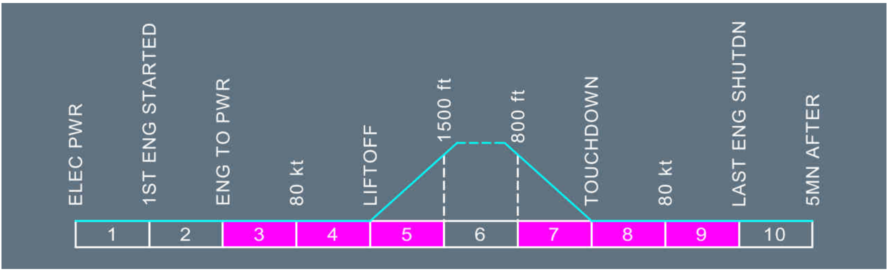
RECORDER DFDR FAULT

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

Ident.: PRO-ABN-RECORDER-A-00017522.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
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TOUCHDOWN
80 kt
LAST ENG SHUTDN
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Ident.: PRO-ABN-RECORDER-A-00010006.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-RECORDER-A-00010007.0001001 / 10 AUG 10

STATUS

INOP SYS

DFDR

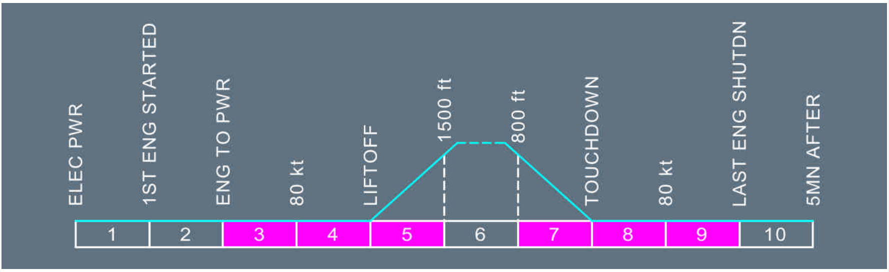
RECORDER FDIU FAULT

Applicable to: LV-GKO, LV-GKP

Ident.: PRO-ABN-RECORDER-B-00017523.0002001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-RECORDER-B-00010008.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-RECORDER-B-00010010.0001001 / 16 NOV 11

STATUS

INOP SYS

FDIU

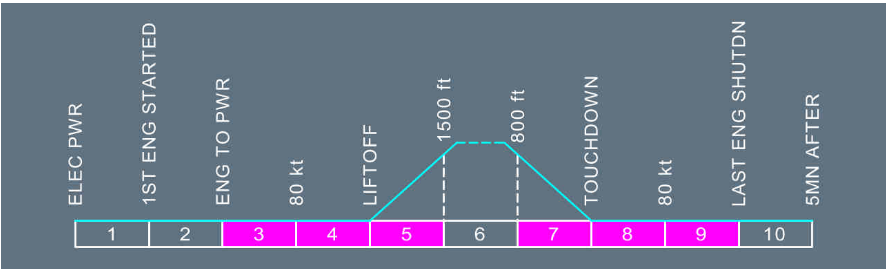
RECORDER SYS FAULT

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Ident.: PRO-ABN-RECORDER-B-00017523.0004001 / 21 MAR 16

ANNUNCIATIONS

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-RECORDER-B-00010008.0002001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-RECORDER-B-00010010.0002001 / 16 NOV 11

STATUS

INOP SYS

RECORDER SYS

Intentionally left blank

SEVERE ICE DETECTED

Applicable to: ALL

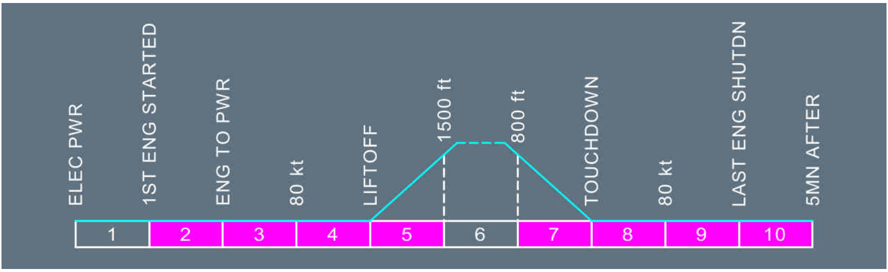
Ident.: PRO-ABN-SEVERE_ICE-AF-00017307.0001001 / 02 MAY 17

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when heavy ice is detected in flight above 1 500 ft (with TAT < 10 °C) and the WING ANTI ICE pb-sw is set to OFF or ENG X ANTI ICE pb-sw is set to OFF.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SEVERE_ICE-AF-00018835.0001001 / 21 MAR 16

ENG (ALL) ANTI ICE..ON
ENG START SEL..IGN

L2 *This line is displayed, if continuous IGNITION is not automatically selected.*

L1
- **If bleed configuration (due to failures) permits WAI selection:**
  WING ANTI ICE..ON
- **If bleed configuration (due to failures) does not permit WAI selection:**
  WING ANTI ICE..OFF
  AVOID ICING CONDITIONS

Intentionally left blank

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: LV-GKO, LV-GKP

Ident.: PRO-ABN-SMOKE-L-00011660.0001001 / 09 NOV 21

This procedure includes all the steps of the SMOKE AVNCS VENT SMOKE procedure.

Apply this procedure when:
- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
  - The avionics
  - The air conditioning
  - The cabin equipment.
- Requested by the SMOKE AVNCS VENT SMOKE procedure
- There is a smell of smoke/fumes in the cockpit:
  - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid
  - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other SMOKE ECAM alert triggers (e.g. CARGO), the flight crew must first apply the ECAM procedure and then consider applying this procedure.
Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:
- The procedure lines above the boxed items indicate the immediate actions that the flight crew must perform, if smoke/fumes are detected (with or without ECAM activation, and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In parallel, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
  - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
  - The situation becomes critical and can no longer be controlled.
- The procedure lines below the AT ANY TIME Items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

APPLY IMMEDIATELY

CREW OXY MASKS (if required)..USE / 100% / EMERG

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.
Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION EXTRACT.......OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.......OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALLEY.......OFF
SIGNS.......ON
CKPT / CABIN COM.......ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.

● **If smoke/fumes source immediately obvious, accessible and extinguishable:**
FAULTY EQT.......ISOLATE

● **If smoke/fumes source not immediately isolated:**
DIVERSION.......INITIATE
DESCENT TO FL 100 / MEA-MORA.......INITIATE

● **At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:**
REMOVAL OF SMOKE / FUMES.......CONSIDER

When necessary, the smoke/fumes removal procedure must be applied before the electrical emergency configuration is set. Indeed, in electrical emergency configuration, smoke/fumes removal cannot be performed.
Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

ELEC EMER CONFIG.......CONSIDER

Refer to the end of the procedure to set ELEC EMER CONFIG.

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**
IMMEDIATE LANDING.......CONSIDER

Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the cockpit's ventilation outlets, or if smoke/fumes are detected in the cabin, the flight crew may suspect an AIR COND SMOKE. In addition, very

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

shortly thereafter, several other SMOKE ECAM alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must therefore be applied.

- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceptible in the cockpit and/or cabin. In that case, it will be re-circulated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the SMOKE AVNCS VENT SMOKE alert is triggered, the flight crew may suspect avionics smoke/fumes
- If smoke/fumes are detected, while an equipment is declared faulty, the flight crew may suspect that smoke/fumes are coming from this equipment.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00011661.0002001 / 09 NOV 21

- **If AIR COND smoke/fumes suspected:**

  APU BLEED....OFF
  VENTILATION EXTRACT....AUTO

  Note: *When VENTILATION EXTRACT pb-sw is in the OVRD position, a single pack may not be able to maintain cabin pressure.*

  CARGO BULK ISOL VALVES....OFF

  To prevent a cargo smoke/fumes warning from being triggered due to cabin smoke/fumes.

  PACK 1....OFF

  - **If smoke/fumes continue:**

    PACK 1....ON
    PACK 2....OFF

    - **If smoke/fumes persist:**

      PACK 2....ON

      If the crew suspects that the smoke/fumes does not come from PACK 2, normal pack configuration can be restored.

      VENTILATION EXTRACT....OVRD

  REMOVAL OF SMOKE / FUMES....CONSIDER

  Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

- **If CABIN EQPT smoke/fumes suspected:**

  PAX SYS....OFF

  - **If smoke/fumes continue:**

    EMER EXIT LT....ON

    To recover minimum cabin lighting when the COMMERCIAL pb is switched OFF.

    COMMERCIAL....OFF
    SMOKE / FUMES DISSIPATION....CHECK
    FAULTY EQPT....SEARCH / ISOLATE

    Cabin lights, reading lights, passenger system, and galleys have dedicated control or C/B in the cabin or cockpit.

    - **If smoke/fumes persist or when faulty equipment confirmed isolated:**

      PAX SYS....NORM
      COMMERCIAL....NORM

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

REMOVAL OF SMOKE / FUMES.. CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00011663.0001001 / 09 NOV 21

- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**

  Consider shedding the AC BUS bar on one side. Then, if unsuccessful, on the other. When it is clear that the shedded side is not involved, reconnect it.

  - **Shed AC BUS 1 as follows:**

    GEN 2....................CHECK ON
    ECAM/ND SEL....................F/O

    The ECAM SD will be lost during the sequence. Switching is necessary to allow ELEC page monitoring.

    ELEC/AC page....................SELECT
    BUS TIE....................OFF

    The BUS TIE OFF caution is triggered after 5 s.

    AC ESS FEED....................ALTN

    Avoids autopilot and autothrust disconnection during electrical transients.

    GEN 1....................OFF

    The ECAM SD is lost.

    Note: *If this electrical configuration is maintained, the Captain’s Total Air Temperature and angle-of-attack, standby angle-of-attack, and pitot are not deiced. PFD1 and STBY instruments may display erroneous data in icing conditions. Use PFD2.*

    SMOKE / FUMES DISSIPATION....................CHECK

    - **If smoke/fumes continue:**

      GEN 1....................ON
      AC ESS FEED....................NORM
      ECAM/ND SEL....................NORM

  - **Shed AC BUS 2 as follows:**

    GEN 1....................CHECK ON
    BUS TIE....................CHECK OFF
    AC ESS FEED....................CHECK NORM
    ECAM/ND SEL....................CHECK NORM
    GEN 2....................OFF

    PFD2 and ND2 are lost.

    SMOKE / FUMES DISSIPATION....................CHECK

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

- **If smoke/fumes continue:**
  GEN 2..ON
  BUS TIE..AUTO

REMOVAL OF SMOKE / FUMES..CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

ELEC EMER CONFIG..CONSIDER

Refer to the end of the procedure to set ELEC EMER CONFIG.

Continued on the following page

Ident.: PRO-ABN-SMOKE-L-00012568.0116001 / 03 NOV 21

TO SET ELEC EMER CONFIG

EMER ELEC PWR....................MAN ON

- **When EMER GEN is available:**

  GEN 1....................OFF
  GEN 2....................OFF
  APU GEN....................OFF

ASSOCIATED PROCEDURES

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the SMOKE AVNCS VENT SMOKE alert is triggered or not before the flight crew sets the electrical emergency configuration.

- **If SMOKE AVNCS VENT SMOKE not triggered:**

  APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

  - **At 3 min before landing or 2 000 ft AAL:**

    Restore all generators 3 min before landing or at 2 000 ft AAL to recover normal braking and normal flight control law, while minimizing possible reactivation of a smoke source. Just before restoring all generators, switch F/O side on IR 3, since:
    - IR 3 is not lost in ELEC EMER CONFIG
    - IR 2 is recovered but faulty since not aligned, and PFD 2 and ND 2 are recovered after that generators are on.

    ATT HDG sw....................F/O ON 3
    ALL GENs....................ON

  - **When aircraft stopped:**

    ALL GENs....................OFF

- **If SMOKE AVNCS VENT SMOKE triggered:**

  The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

  VHF1/ATC1....................USE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

CAUTION	*In the case of discrepancies between the airspeed indications on the Captain's PFD and on standby indicator, disregard the standby indicator (probe not deiced).*

Note:
1. *Only VOR 1 or ADF 1 (as selected on the DDRMI) is available. The VOR/ADF selector position on the FCU must be in accordance with the VOR/ADF selector on the DDRMI.*
2. *ENG ANTI-ICE pb-sw is ON, regardless of the pushbutton's position, so fuel consumption increases by approximately 1.5 %.*

CTR TANK XFR BY GRAVITY
CTR TK UNUSABLE IF < 15 T

Note: As fuel is fed from one side only, fuel balance must be monitored. To maintain fuel balance, L PUMP 2 can be selected OFF. R PUMP 2 will then automatically start (its corresponding FAULT light will go off).

WEIGHT/CG...INITIALIZE

This line appears because the FCMCs lose the WEIGHT/CG information, due to the power interruption that occurs before EMER GEN activation.
The GW and CG must be initialized again in the FCMC, by manually re-entering their values in the FUEL PRED page.

- **For slats extension:**
  RAT MAN...ON
  LAND RECOVERY...ON

  SFCC 1, LGCIU 1, BSCU 1, and WHC 1 are recovered. The remaining fuel pump is lost.

- **For L/G gravity extension:**
  MAX SPEED...200 KT
  L/G GRVTY EXTN...DOWN

- **When L/G downlocked:**
  L/G LEVER...DOWN

  Note: In the case of a go-around, gear retraction is not available, and CLIMB performance is degraded.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

- **At 3 min before landing or 2 000 ft AAL:**

  Restore all generators 3 min before landing or at 2 000 ft AAL to recover normal braking and normal flight control law, while minimizing possible reactivation of a smoke source. Just before restoring all generators, switch F/O side on IR 3, since:
  - IR 3 is not lost in ELEC EMER CONFIG
  - IR 2 is recovered but faulty since not aligned, and PFD 2 and ND 2 are recovered after that generators are on.

  ATT HDG sw..F/O ON 3
  ALL GENs..ON

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00012573.0100001 / 03 NOV 21

STATUS

SPD BRK...DO NOT USE
MAX SPEED.. 330/.82

APPR PROC

- **FOR SLATS EXTENSION:**
  RAT MAN... ON
  LAND RECOVERY..ON
  FOR LDG..USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
- **FOR L/G GRVTY EXTN:**
  MAX SPEED...200 KT
  L/G GRVTY EXTN... DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G LEVER...DOWN
- **3 MIN/2000 FT BEFORE LDG:**
  ATT HDG SWTG... F/O ON 3
  ALL GEN... ON
- **WHEN L/G DN:**
  MAN PITCH TRIM... USE
  When the landing gear is extended and the GENs are off, the automatic pitch trim is inoperative.

LDG DIST PROC... APPLY

- **WHEN A/C IS STOPPED:**
  ALL GEN.. OFF

ALTN LAW : PROT LOST
FUEL CONSUMP INCRSD
ENG HI IDLE
CTR TK UNUSABLE IF < 15 T

INOP SYS

F/CTL PROT
PRIM 2+3
RA 1+2
AP 2
VHF 2+3
HALF SPLRS
REVERSERS
ADR 2 (1)
CAT 2
N/W STRG
MOST F PUMPS (1)
GPS 2
HF 2 (1)
CAT 3 DUAL (2)
N/W STRG (2)
L FUEL PUMP 2 (2)
IR 2 (2)
PRED W/S DET

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

CTR TO INR : MAN ONLY
L(R) INR TK: 2T UNUSABLE

Note: STATUS is simplified in ELEC EMER CONFIG. Only the most significant STS items are displayed.

(1) *(After LAND RECOVERY selection: SLATS/FLAPS channel 1, LGCIU 1, BSCU 1, and WHC 1 are recovered. Remaining fuel pump (L FUEL PUMP 2 or R FUEL PUMP 2) will stop. SLATS/FLAPS SLOW is displayed as information on STS. HF 1, AP 1, and ADR 3 are lost after LAND RECOVERY selection.)*

(2) *(Those inoperative systems are displayed after recovery of normal electrical supply.)*

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Ident.: PRO-ABN-SMOKE-L-00011660.0001001 / 09 NOV 21

This procedure includes all the steps of the SMOKE AVNCS VENT SMOKE procedure.

Apply this procedure when:
- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
  - The avionics
  - The air conditioning
  - The cabin equipment.
- Requested by the SMOKE AVNCS VENT SMOKE procedure
- There is a smell of smoke/fumes in the cockpit:
  - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid
  - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other SMOKE ECAM alert triggers (e.g. CARGO), the flight crew must first apply the ECAM procedure and then consider applying this procedure.
Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:
- The procedure lines above the boxed items indicate the immediate actions that the flight crew must perform, if smoke/fumes are detected (with or without ECAM activation, and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In parallel, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
  - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
  - The situation becomes critical and can no longer be controlled.
- The procedure lines below the AT ANY TIME Items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

APPLY IMMEDIATELY

CREW OXY MASKS (if required).. USE / 100% / EMERG

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.
Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION EXTRACT.......................................OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.......................................OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALLEY.......................................OFF
SIGNS.......................................ON
CKPT / CABIN COM.......................................ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.

- **If smoke/fumes source immediately obvious, accessible and extinguishable:**
  FAULTY EQT.......................................ISOLATE
- **If smoke/fumes source not immediately isolated:**
  DIVERSION.......................................INITIATE
  DESCENT TO FL 100 / MEA-MORA.......................................INITIATE

- **At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:**
  REMOVAL OF SMOKE / FUMES.......................................CONSIDER
  When necessary, the smoke/fumes removal procedure must be applied before the electrical emergency configuration is set. Indeed, in electrical emergency configuration, smoke/fumes removal cannot be performed.
  Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.
  ELEC EMER CONFIG.......................................CONSIDER
  Refer to the end of the procedure to set ELEC EMER CONFIG.

- **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**
  IMMEDIATE LANDING.......................................CONSIDER
  Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the cockpit's ventilation outlets, or if smoke/fumes are detected in the cabin, the flight crew may suspect an AIR COND SMOKE. In addition, very

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

shortly thereafter, several other SMOKE ECAM alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must therefore be applied.

- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceptible in the cockpit and/or cabin. In that case, it will be re-circulated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the SMOKE AVNCS VENT SMOKE alert is triggered, the flight crew may suspect avionics smoke/fumes
- If smoke/fumes are detected, while an equipment is declared faulty, the flight crew may suspect that smoke/fumes are coming from this equipment.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00011661.0008001 / 09 NOV 21

- **If AIR COND smoke/fumes suspected:**

  APU BLEED....OFF
  VENTILATION EXTRACT....AUTO

  Note: *When VENTILATION EXTRACT pb-sw is in the OVRD position, a single pack may not be able to maintain cabin pressure.*

  ALL CARGO ISOL VALVES....OFF

  To prevent a cargo smoke/fumes warning from being triggered due to cabin smoke/fumes.

  PACK 1....OFF

  - **If smoke/fumes continue:**

    PACK 1....ON
    PACK 2....OFF

    - **If smoke/fumes persist:**

      PACK 2....ON

      If the crew suspects that the smoke/fumes does not come from PACK 2, normal pack configuration can be restored.

      VENTILATION EXTRACT....OVRD

  REMOVAL OF SMOKE / FUMES....CONSIDER

  Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

- **If CABIN EQPT smoke/fumes suspected:**

  PAX SYS....OFF

  - **If smoke/fumes continue:**

    EMER EXIT LT....ON

    To recover minimum cabin lighting when the COMMERCIAL pb is switched OFF.

    COMMERCIAL....OFF
    SMOKE / FUMES DISSIPATION....CHECK
    FAULTY EQPT....SEARCH / ISOLATE

    Cabin lights, reading lights, passenger system, and galleys have dedicated control or C/B in the cabin or cockpit.

    - **If smoke/fumes persist or when faulty equipment confirmed isolated:**

      PAX SYS....NORM
      COMMERCIAL....NORM

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

REMOVAL OF SMOKE / FUMES.. CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00011663.0001001 / 09 NOV 21

- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**

  Consider shedding the AC BUS bar on one side. Then, if unsuccessful, on the other. When it is clear that the shedded side is not involved, reconnect it.

  - **Shed AC BUS 1 as follows:**

    GEN 2 .... CHECK ON
    ECAM/ND SEL .... F/O

    The ECAM SD will be lost during the sequence. Switching is necessary to allow ELEC page monitoring.

    ELEC/AC page .... SELECT
    BUS TIE .... OFF

    The BUS TIE OFF caution is triggered after 5 s.

    AC ESS FEED .... ALTN

    Avoids autopilot and autothrust disconnection during electrical transients.

    GEN 1 .... OFF

    The ECAM SD is lost.

    Note: *If this electrical configuration is maintained, the Captain's Total Air Temperature and angle-of-attack, standby angle-of-attack, and pitot are not deiced. PFD1 and STBY instruments may display erroneous data in icing conditions. Use PFD2.*

    SMOKE / FUMES DISSIPATION .... CHECK

    - **If smoke/fumes continue:**

      GEN 1 .... ON
      AC ESS FEED .... NORM
      ECAM/ND SEL .... NORM

  - **Shed AC BUS 2 as follows:**

    GEN 1 .... CHECK ON
    BUS TIE .... CHECK OFF
    AC ESS FEED .... CHECK NORM
    ECAM/ND SEL .... CHECK NORM
    GEN 2 .... OFF

    PFD2 and ND2 are lost.

    SMOKE / FUMES DISSIPATION .... CHECK

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

- **If smoke/fumes continue:**
  GEN 2..........ON
  BUS TIE..........AUTO

REMOVAL OF SMOKE / FUMES..........CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

ELEC EMER CONFIG..........CONSIDER

Refer to the end of the procedure to set ELEC EMER CONFIG.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00012568.0121001 / 03 NOV 21

TO SET ELEC EMER CONFIG

EMER ELEC PWR.......................................MAN ON

- **When EMER GEN is available:**
  GEN 1.......................................OFF
  GEN 2.......................................OFF
  APU GEN.......................................OFF

ASSOCIATED PROCEDURES

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the SMOKE AVNCS VENT SMOKE alert is triggered or not before the flight crew sets the electrical emergency configuration.

- **If SMOKE AVNCS VENT SMOKE not triggered:**

  APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

  - **At 3 min or 2 000 ft AAL before landing:**

    Restore all generators 3 min before landing or at 2 000 ft AAL to recover normal braking and normal flight control law, while minimizing possible reactivation of a smoke source.
    Just before restoring all generators, switch F/O side on IR 3, since:
    - IR 3 is not lost in ELEC EMER CONFIG
    - IR 2 is recovered but faulty since not aligned, and PFD 2 and ND 2 are recovered after that generators are on.

    ATT HDG sw.......................................F/O ON 3
    ALL GENs.......................................ON

  - **When aircraft stopped:**
    ALL GENs.......................................OFF

- **If SMOKE AVNCS VENT SMOKE triggered:**
  The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

  VHF1/ATC1.......................................USE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

CAUTION	*In the case of discrepancies between the airspeed indications on the Captain's PFD and on standby indicator, disregard the standby indicator (probe not deiced).*

Note: *ENG ANTI-ICE pb-sw is ON, regardless of the pushbutton's position, so fuel consumption increases by approximately 1.5 %.*

CTR TK XFR BY GRVTY
CTR TK UNUSABLE IF < 15 T

Note: *As fuel is fed from one side only, fuel balance must be monitored. To maintain fuel balance, L PUMP 2 can be selected OFF. R PUMP 2 will then automatically start (its corresponding FAULT light will go off).*

WEIGHT/CG.. INITIALIZE

This line appears because the FCMCs lose the WEIGHT/CG information, due to the power interruption that occurs before EMER GEN activation.
The GW and CG must be initialized again in the FCMC, by manually re-entering their values in the FUEL PRED page.

- **For slats extension:**
  RAT MAN.. ON
  LAND RECOVERY.. ON
  SFCC 1, LGCIU 1, BSCU 1, and WHC 1 are recovered. The remaining fuel pump is lost.
- **For L/G gravity extension:**
  MAX SPEED.. 200 KT
  L/G GRVTY EXTN.. DOWN
- **When L/G downlocked:**
  L/G lever.. DOWN

  Note: *In the case of a go-around, gear retraction is not available, and CLIMB performance is degraded.*
- **At 3 min before landing or 2 000 ft AAL:**

  Restore all generators 3 min before landing or at 2 000 ft AAL to recover normal braking and normal flight control law, while minimizing possible reactivation of a smoke source. Just before restoring all generators, switch F/O side on IR 3, since:
  - IR 3 is not lost in ELEC EMER CONFIG

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

- IR 2 is recovered but faulty since not aligned, and PFD 2 and ND 2 are recovered after that generators are on.

ATT HDG sw...F/O ON 3
ALL GENs...ON

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00012573.0100001 / 03 NOV 21

STATUS

SPD BRK..........................DO NOT USE
MAX SPEED..........................330/.82

APPR PROC

● **FOR SLATS EXTENSION:**
RAT MAN..........................ON
LAND RECOVERY..........................ON
FOR LDG..........................USE FLAP 3

This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.

● **FOR L/G GRVTY EXTN:**
MAX SPEED..........................200 KT
L/G GRVTY EXTN..........................DOWN

● **WHEN L/G DOWNLOCKED:**
L/G LEVER..........................DOWN

● **3 MIN/2000 FT BEFORE LDG:**
ATT HDG SWTG..........................F/O ON 3
ALL GEN..........................ON

● **WHEN L/G DN:**
MAN PITCH TRIM..........................USE

When the landing gear is extended and the GENs are off, the automatic pitch trim is inoperative.

LDG DIST PROC..........................APPLY

● **WHEN A/C IS STOPPED:**
ALL GEN..........................OFF

ALTN LAW : PROT LOST
FUEL CONSUMP INCRSD
ENG HI IDLE
CTR TK UNUSABLE IF < 15 T

INOP SYS

F/CTL PROT
PRIM 2+3
RA 1+2
AP 2
VHF 2+3
HALF SPLRS
REVERSERS
ADR 2 (1)
CAT 2
N/W STRG
MOST F PUMPS (1)
GPS 2
HF 2 (1)
CAT 3 DUAL (2)
N/W STRG (2)
L FUEL PUMP 2 (2)
IR 2 (2)
PRED W/S DET

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

CTR TO INR : MAN ONLY
L(R) INR TK: 2T UNUSABLE

Note: *STATUS is simplified in ELEC EMER CONFIG. Only the most significant STS items are displayed.*

(1) *(After LAND RECOVERY selection: SLATS/FLAPS channel 1, LGCIU 1, BSCU 1, and WHC 1 are recovered. Remaining fuel pump (L FUEL PUMP 2 or R FUEL PUMP 2) will stop. SLATS/FLAPS SLOW is displayed as information on STS. HF 1, AP 1, and ADR 3 are lost after LAND RECOVERY selection.)*

(2) *(Those inoperative systems are displayed after recovery of normal electrical supply.)*

[QRH] SMOKE / FUMES / AVNCS SMOKE

Applicable to: LV-KHT, LV-KHU

Ident.: PRO-ABN-SMOKE-L-00011660.0001001 / 09 NOV 21

This procedure includes all the steps of the SMOKE AVNCS VENT SMOKE procedure.

Apply this procedure when:
- The flight (cabin) crew suspect that smoke/fumes are coming from any of the following:
  - The avionics
  - The air conditioning
  - The cabin equipment.
- Requested by the SMOKE AVNCS VENT SMOKE procedure
- There is a smell of smoke/fumes in the cockpit:
  - If the smell is similar to that of orange peels, suspect a toxic leak of rain repellent fluid
  - If the smell is similar to that of pine needles, suspect a non-toxic leak.

If any other SMOKE ECAM alert triggers (e.g. CARGO), the flight crew must first apply the ECAM procedure and then consider applying this procedure.
Note that these ECAM alerts may be caused by another source, that should usually first be detected by the flight crew/cabin crew/avionics smoke detectors.

The following explains the layout of this procedure:
- The procedure lines above the boxed items indicate the immediate actions that the flight crew must perform, if smoke/fumes are detected (with or without ECAM activation, and regardless of the smoke/fumes source). These immediate actions correspond to the most common steps to be taken in smoke/fumes cases. In parallel, the flight crew must also be prepared to immediately perform a diversion. However, this diversion may be avoided if the smoke/fumes source is obvious, accessible and extinguishable or confirmed isolated (after completion of the immediate actions).
- The boxed items indicate the actions that the flight crew must consider, if at any time during the remainder of the procedure but always after the initial steps:
  - Smoke/fumes become the greatest threat and removal of smoke/fumes is required, and/or
  - The situation becomes critical and can no longer be controlled.
- The procedure lines below the AT ANY TIME Items indicate the actions that the flight crew must perform, as soon as they suspect a source of smoke/fumes. The actions will depend on whether the smoke/fumes are coming from the avionics, and/or air conditioning, and/or cabin equipment.

LAND ASAP

APPLY IMMEDIATELY

CREW OXY MASKS (if required).. USE / 100% / EMERG

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ensure crew communication is established. Avoid continuous use of the interphone to minimize interference from the oxygen mask breathing noise.
Turn the emergency knob to remove condensation or smoke/fumes from the mask.

VENTILATION EXTRACT.......OVRD

Avionics ventilation air is extracted overboard.

CAB FANS.......OFF

To prevent smoke/fumes from entering the cockpit and cabin.

GALLEY.......OFF
SIGNS.......ON
CKPT / CABIN COM.......ESTABLISH

Communication must be established with the cabin crew in order to follow up on the smoke/fumes origin and dissipation.

● **If smoke/fumes source immediately obvious, accessible and extinguishable:**
FAULTY EQT.......ISOLATE

● **If smoke/fumes source not immediately isolated:**
DIVERSION.......INITIATE
DESCENT TO FL 100 / MEA-MORA.......INITIATE

● **At ANY TIME of the procedure, if smoke/fumes become the GREATEST THREAT:**
REMOVAL OF SMOKE / FUMES.......CONSIDER

When necessary, the smoke/fumes removal procedure must be applied before the electrical emergency configuration is set. Indeed, in electrical emergency configuration, smoke/fumes removal cannot be performed.
Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

ELEC EMER CONFIG.......CONSIDER

Refer to the end of the procedure to set ELEC EMER CONFIG.

● **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**
IMMEDIATE LANDING.......CONSIDER

Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.

Guidelines to determine smoke/fumes source:

- If smoke/fumes initially come out of the cockpit's ventilation outlets, or if smoke/fumes are detected in the cabin, the flight crew may suspect an AIR COND SMOKE. In addition, very

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

shortly thereafter, several other SMOKE ECAM alerts (cargo, lavatory, avionics) will be triggered. The displayed ECAM procedures must therefore be applied.

- After an ENG or APU failure, smoke/fumes may come from the faulty item via the bleed system and be perceptible in the cockpit and/or cabin. In that case, it will be re-circulated throughout the aircraft, until it completely disappears from the air conditioning system.
- If only the SMOKE AVNCS VENT SMOKE alert is triggered, the flight crew may suspect avionics smoke/fumes
- If smoke/fumes are detected, while an equipment is declared faulty, the flight crew may suspect that smoke/fumes are coming from this equipment.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00011661.0008001 / 09 NOV 21

- **If AIR COND smoke/fumes suspected:**

  APU BLEED.....OFF
  VENTILATION EXTRACT.....AUTO

  Note: *When VENTILATION EXTRACT pb-sw is in the OVRD position, a single pack may not be able to maintain cabin pressure.*

  ALL CARGO ISOL VALVES.....OFF

  To prevent a cargo smoke/fumes warning from being triggered due to cabin smoke/fumes.

  PACK 1.....OFF

  - **If smoke/fumes continue:**

    PACK 1.....ON
    PACK 2.....OFF

    - **If smoke/fumes persist:**

      PACK 2.....ON

      If the crew suspects that the smoke/fumes does not come from PACK 2, normal pack configuration can be restored.

      VENTILATION EXTRACT.....OVRD

  REMOVAL OF SMOKE / FUMES.....CONSIDER

  Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

- **If CABIN EQPT smoke/fumes suspected:**

  PAX SYS.....OFF

  - **If smoke/fumes continue:**

    EMER EXIT LT.....ON

    To recover minimum cabin lighting when the COMMERCIAL pb is switched OFF.

    COMMERCIAL.....OFF
    SMOKE / FUMES DISSIPATION.....CHECK
    FAULTY EQPT.....SEARCH / ISOLATE

    Cabin lights, reading lights, passenger system, and galleys have dedicated control or C/B in the cabin or cockpit.

    - **If smoke/fumes persist or when faulty equipment confirmed isolated:**

      PAX SYS.....NORM
      COMMERCIAL.....NORM

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

REMOVAL OF SMOKE / FUMES.. CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00011663.0001001 / 09 NOV 21

- **If smoke/fumes source cannot be determined and persist or AVNCS / ELECTRICAL smoke/fumes suspected:**

  Consider shedding the AC BUS bar on one side. Then, if unsuccessful, on the other. When it is clear that the shedded side is not involved, reconnect it.

  - **Shed AC BUS 1 as follows:**

    GEN 2.....CHECK ON
    ECAM/ND SEL..... F/O

    The ECAM SD will be lost during the sequence. Switching is necessary to allow ELEC page monitoring.

    ELEC/AC page..... SELECT
    BUS TIE..... OFF

    The BUS TIE OFF caution is triggered after 5 s.

    AC ESS FEED..... ALTN

    Avoids autopilot and autothrust disconnection during electrical transients.

    GEN 1.....OFF

    The ECAM SD is lost.

    Note: *If this electrical configuration is maintained, the Captain’s Total Air Temperature and angle-of-attack, standby angle-of-attack, and pitot are not deiced. PFD1 and STBY instruments may display erroneous data in icing conditions. Use PFD2.*

    SMOKE / FUMES DISSIPATION..... CHECK

    - **If smoke/fumes continue:**

      GEN 1.....ON
      AC ESS FEED.....NORM
      ECAM/ND SEL.....NORM

  - **Shed AC BUS 2 as follows:**

    GEN 1.....CHECK ON
    BUS TIE.....CHECK OFF
    AC ESS FEED.....CHECK NORM
    ECAM/ND SEL..... CHECK NORM
    GEN 2.....OFF

    PFD2 and ND2 are lost.

    SMOKE / FUMES DISSIPATION..... CHECK

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

- **If smoke/fumes continue:**
  GEN 2 .... ON
  BUS TIE .... AUTO

REMOVAL OF SMOKE / FUMES .... CONSIDER

Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

ELEC EMER CONFIG .... CONSIDER

Refer to the end of the procedure to set ELEC EMER CONFIG.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00012568.0122001 / 03 NOV 21

TO SET ELEC EMER CONFIG

EMER ELEC PWR.....MAN ON

- **When EMER GEN is available:**
  GEN 1.....OFF
  GEN 2.....OFF
  APU GEN.....OFF

ASSOCIATED PROCEDURES

ELEC EMER CONFIG

Two different procedures can be displayed on the ECAM, depending on whether the SMOKE AVNCS VENT SMOKE alert is triggered or not before the flight crew sets the electrical emergency configuration.

■ **If SMOKE AVNCS VENT SMOKE not triggered:**

APPLY ELEC EMER CONFIG PROCEDURE, BUT DO NOT RESET GEN, EVEN IF REQUESTED BY ECAM

- **At 3 min before landing or 2 000 ft AAL:**

  Restore all generators 3 min before landing or at 2 000 ft AAL to recover normal braking and normal flight control law, while minimizing possible reactivation of a smoke source. Just before restoring all generators, switch F/O side on IR 3, since:
  - IR 3 is not lost in ELEC EMER CONFIG
  - IR 2 is recovered but faulty since not aligned, and PFD 2 and ND 2 are recovered after that generators are on.

  ATT HDG sw .....F/O ON 3
  ALL GENs.....ON

- **When aircraft stopped:**
  ALL GENs.....OFF

■ **If SMOKE AVNCS VENT SMOKE triggered:**
The ECAM displays a specific ELEC EMER CONFIG procedure. The flight crew must apply the following ECAM procedure.

VHF1/ATC1.....USE

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

CAUTION	*In the case of discrepancies between the airspeed indications on the Captain's PFD and on standby indicator, disregard the standby indicator (probe not deiced).*

Note: ENG ANTI-ICE pb-sw is ON, regardless of the pushbutton's position, so fuel consumption increases by approximately 1.5 %.

ENG 1+2 N1 DEGRADED MODE
ENG 1 N1 MODE.. ON
ENG 2 N1 MODE.. ON

DO NOT EXCEED N1 LIMIT
MAN THR.. ADJUST
CTR TANK XFR BY GRAVITY
CTR TK UNUSABLE IF < 15 T

Note: As fuel is fed from one side only, fuel balance must be monitored. To maintain fuel balance, L PUMP 2 can be selected OFF. R PUMP 2 will then automatically start (its corresponding FAULT light will go off).

WEIGHT/CG..INITIALIZE

This line appears because the FCMCs lose the WEIGHT/CG information, due to the power interruption that occurs before EMER GEN activation.
The GW and CG must be initialized again in the FCMC, by manually re-entering their values in the FUEL PRED page.

- **For slats extension:**
  RAT MAN..ON
  LAND RECOVERY..ON

  SFCC 1, LGCIU 1, BSCU 1, and WHC 1 are recovered. The remaining fuel pump is lost.

- **For L/G gravity extension:**
  MAX SPEED.. 200 KT
  L/G GRVTY EXTN..DOWN

- **When L/G downlocked:**
  L/G lever.. DOWN

  Note: In the case of a go-around, gear retraction is not available, and CLIMB performance is degraded.

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

- **At 3 min before landing or 2 000 ft AAL:**

  Restore all generators 3 min before landing or at 2 000 ft AAL to recover normal braking and normal flight control law, while minimizing possible reactivation of a smoke source. Just before restoring all generators, switch F/O side on IR 3, since:
  - IR 3 is not lost in ELEC EMER CONFIG
  - IR 2 is recovered but faulty since not aligned, and PFD 2 and ND 2 are recovered after that generators are on.

  ATT HDG sw...F/O ON 3
  ALL GENs...ON

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-L-00012573.0101001 / 03 NOV 21

STATUS

SPD BRK........................DO NOT USE
MAX SPEED........................330/.82

APPR PROC

- **FOR SLATS EXTENSION:**
  RAT MAN........................ON
  LAND RECOVERY........................ON
  FOR LDG........................USE FLAP 3
  This line is replaced by "FOR LDG: USE FLAP 3" when CONF 3 is selected, as a reminder.
- **FOR L/G GRVTY EXTN:**
  MAX SPEED........................200 KT
  L/G GRVTY EXTN........................DOWN
- **WHEN L/G DOWNLOCKED:**
  L/G LEVER........................DOWN
- **3 MIN/2000 FT BEFORE LDG:**
  ATT HDG SWTG........................F/O ON 3
  ALL GEN........................ON
- **WHEN L/G DN:**
  MAN PITCH TRIM........................USE
  When the landing gear is extended and the GENs are off, the automatic pitch trim is inoperative.

LDG DIST PROC........................APPLY

- **WHEN A/C IS STOPPED:**
  ALL GEN........................OFF

ALTN LAW: PROT LOST
FUEL CONSUMP INCRSD
ENG HI IDLE
ENG 1 N1 DEGRADED MODE

INOP SYS

F/CTL PROT
PRIM 2+3
RA 1+2
AP 2
VHF 2+3
HALF SPLRS
REVERSERS
ADR 2 (1)
CAT 2
N/W STRG
MOST F PUMPS (1)
GPS 2
HF 2 (1)
CAT 3 DUAL (2)
N/W STRG (2)
L FUEL PUMP 2 (2)
IR 2 (2)
PRED W/S DET

Continued on the following page

[QRH] SMOKE / FUMES / AVNCS SMOKE (Cont'd)

ENG 2 N1 DEGRADED MODE
CTR TK UNUSABLE IF < 15 T
CTR TO INR: MAN ONLY
L(R) INR TK: 2T UNUSABLE

Note: STATUS is simplified in ELEC EMER CONFIG. Only the most significant STS items are displayed.

(1) *(After LAND RECOVERY selection: SLATS/FLAPS channel 1, LGCIU 1, BSCU 1, and WHC 1 are recovered. Remaining fuel pump (L FUEL PUMP 2 or R FUEL PUMP 2) will stop. SLATS/FLAPS SLOW is displayed as information on STS. HF 1, AP 1, and ADR 3 are lost after LAND RECOVERY selection.)*

(2) *(Those inoperative systems are displayed after recovery of normal electrical supply.)*

[QRH] REMOVAL OF SMOKE / FUMES

Ident.: PRO-ABN-SMOKE-00011627.0001001 / 05 MAY 22
Applicable to: ALL

Apply this [QRH] REMOVAL OF SMOKE / FUMES procedure, if smoke/fumes become the greatest threat when applying the [QRH] SMOKE / FUMES / AVNCS SMOKE procedure.

EMER EXIT LIGHT.......ON
PACK FLOW.......HI

To provide maximum airflow from the packs.
Do not shut down the air conditioning packs, and do not reduce ventilation in an attempt to smother the fire.
Do not deploy oxygen masks, if fire is suspected in the cabin.

LDG ELEV.......10 000 FT / MEA-MORA
DESCENT TO FL 100 / MEA-MORA.......INITIATE

Descent is initiated to FL 100, or the MEA-MORA, or the minimum obstacle clearance altitude, while the cabin altitude is increased to 10 000 ft or the MEA-MORA.
The increase in cabin altitude also reduces, at least temporarily, the smoke/fumes concentration.
Cabin depressurization starts, when descent is initiated.

ATC.......NOTIFY
SMOKE / FUMES / AVNCS SMOKE PROC.......CONTINUE

While descending, continue applying the appropriate steps of the [QRH] SMOKE / FUMES / AVNCS SMOKE procedure, depending on the suspected smoke/fumes source.
Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL.

- **At FL 100 or MEA-MORA:**
  PACK 1.......OFF
  PACK 2.......OFF

  It is not possible to open the cockpit window, when the packs are ON.

  CABIN PRESS MODE SEL.......MAN
  MAN VALVE SEL.......BOTH
  MAN V/S CTL.......FULL UP

  The outflow valves must be fully open to prevent repressurization when the RAM AIR valve is open.

  RAM AIR.......ON

  At FL 100, or MEA-MORA, or minimum obstacle clearance altitude, it is possible to open the RAM AIR valve, when ΔP is 1 PSI or below. RAM AIR does not assist smoke/fumes removal, but allows flying with both packs OFF (after window opening).

Continued on the following page

[QRH] REMOVAL OF SMOKE / FUMES (Cont'd)

- **If smoke/fumes persist:**

  If there is smoke/fumes in the cockpit, open the cockpit window to evacuate the smoke/fumes.

  MAX SPEED: 230 kt
  COCKPIT DOOR...OPEN
  HEADSETS...ON
  PM SLIDING WINDOW...OPEN

  - **When window is open:**

    NON-AFFECTED PACK(s)...ON
    VISUAL WARNINGS (noisy cockpit)..MONITOR

    Due to the increased noise level, pay particular attention to visual warnings.

    SMOKE / FUMES / AVNCS SMOKE PROC...CONTINUE

    Continue applying the appropriate steps of the [QRH] SMOKE / FUMES / AVNCS SMOKE procedure depending on the suspected smoke/fumes source.
    Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL.

[QRH] SMOKE / FIRE FROM LITHIUM BATTERY

Ident.: PRO-ABN-SMOKE-00015934.0001001 / 09 NOV 21
Applicable to: ALL

If necessary, transfer control to the flight crewmember seated on the opposite side of the fire.

CKPT / CAB COM....................ESTABLISH
STORAGE AFTER Li BAT FIRE cabin procedure....................REQUEST INITIATION

- **If flames:**
  CREW OXY MASK (PF)....................USE / 100% / EMER
  PBE (PM)....................USE
  FIRE EXTINGUISHER....................USE
- **If no flames or when flames extinguished:**
  - **If not possible to remove device from the cockpit:**
    WATER or NON-ALCOHOLIC LIQUID....................POUR ON DEVICE
    DEVICE....................MONITOR
  - **If possible to remove device from the cockpit:**
    DEVICE....................TRANSFER TO CABIN

- **At ANY TIME of the procedure, if SMOKE becomes the GREATEST THREAT:**
  REMOVAL OF SMOKE / FUMES procedure....................CONSIDER
  Refer to PRO-ABN-SMOKE [QRH] REMOVAL OF SMOKE / FUMES.

- **At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:**
  IMMEDIATE LANDING....................CONSIDER
  L2 *Depending on the situation, the Captain can consider an overweight landing, a tailwind landing, a ditching, a forced landing, etc.*

SMOKE AFT/BULK CRG SMOKE

Applicable to: ALL

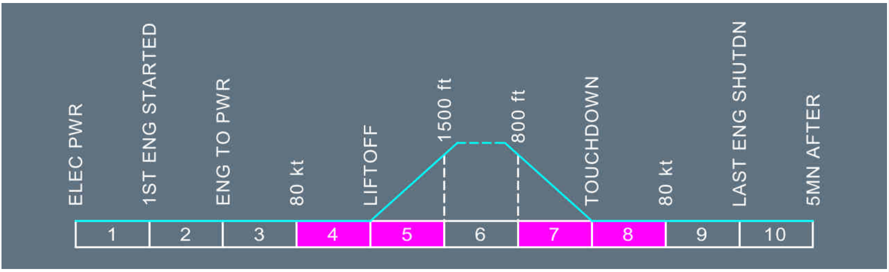
Ident.: PRO-ABN-SMOKE-G-00017533.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the corresponding cargo compartment is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-G-00018025.0002001 / 21 MAR 17

LAND ASAP

AFT ISOL VALVE ◁ (IF NOT AUTOMATICALLY CLOSED)....................OFF
BULK ISOL VALVE (IF NOT AUTOMATICALLY CLOSED)....................OFF

- **IF AFT/BULK CRG CLOSED (displayed on ground only):**
  AFT AGENT....................DISCH

CAB FANS....................OFF

- **AT LOWER DECK:**
  CREW RESTS ◁ ....EVACUATE
  CREW RESTS DOORS ◁ .... CLOSE

- **ON GROUND BEFORE OPEN CRG DOORS:**
  PAX.................... DISEMBARK

L2 *Note:* *Refer to PRO-ABN-SMOKE SMOKE FWD CRG SMOKE. They are applicable to the AFT/BULK CRG SMOKE procedure.*

Continued on the following page

SMOKE AFT/BULK CRG SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-G-00018026.0002001 / 21 MAR 16

STATUS

- **BEFORE OPEN CARGO DOORS (displayed only on ground):**
  PAX...DISEMBARK

INOP SYS

AFT CRG VENT
BULK VENT
BULK HEAT

SMOKE AVIONICS DET FAULT

Applicable to: ALL

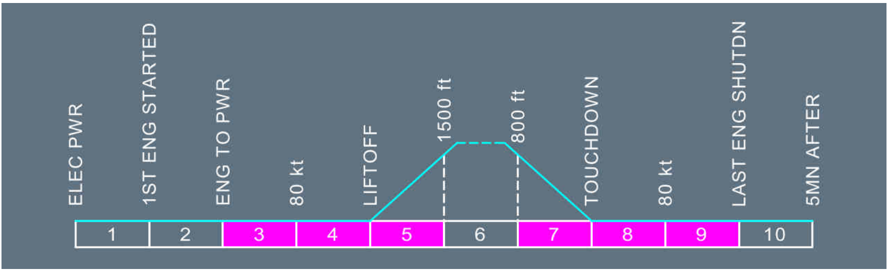
Ident.: PRO-ABN-SMOKE-K-00017469.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when all of the avionic smoke detectors are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-K-00011653.0001001 / 25 FEB 14

L2 Avionics compartment smoke detection is lost.

L1 Crew awareness.

Continued on the following page

SMOKE AVIONICS DET FAULT (Cont'd)

Ident.: PRO-ABN-SMOKE-K-00011655.0001001 / 18 AUG 10

STATUS

INOP SYS

AVNCS DET

SMOKE AVNCS VENT SMOKE

Applicable to: ALL

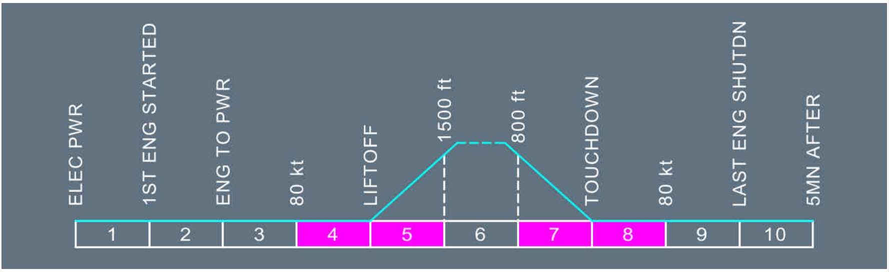
Ident.: PRO-ABN-SMOKE-AL-00017471.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the ventilation extraction duct is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
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TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AL-00018037.0001001 / 21 MAR 17

L2 The description of this procedure is included in the SMOKE/FUMES/AVNCS SMOKE procedure. (*Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL*)

SMOKE BBAND DET FAULT ⩤

Applicable to: ALL

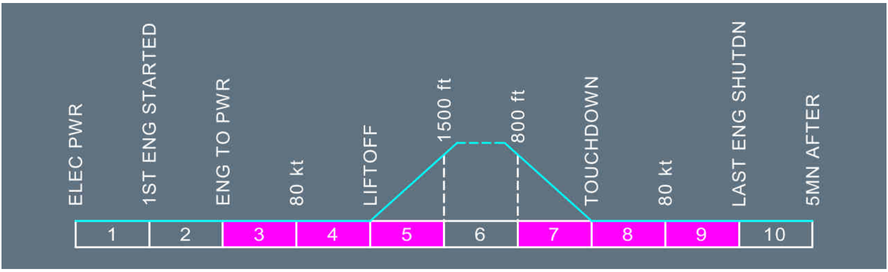
Ident.: PRO-ABN-SMOKE-AD-00017565.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a smoke detection in the ventilation duct of the Broadband system is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AD-00015693.0001001 / 05 JAN 15

L2 Smoke detection is lost in the Broadband System.

L1 PAX BBAND...OFF

Ident.: PRO-ABN-SMOKE-AD-00015694.0001001 / 05 JAN 15

STATUS

INOP SYS

BBAND DET

SMOKE BULK AVN SMOKE

Applicable to: ALL

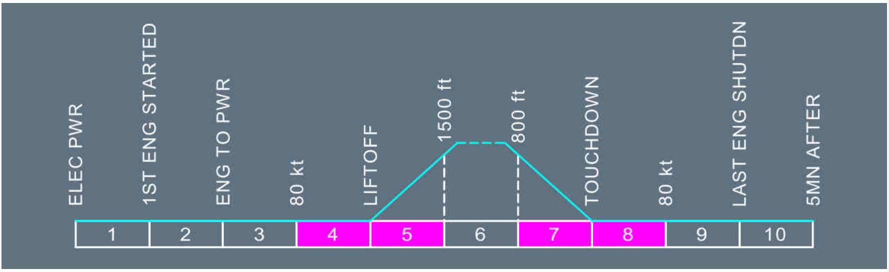
Ident.: PRO-ABN-SMOKE-AM-00017548.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the bulk cargo rack is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AM-00018071.0003001 / 13 JUL 16

LAND ASAP

BULK AVNCS ⊲ .... OFF

PAX SYS ⊲ .... OFF

L2 *This will confirm the automatic cut-off of the power supply.*

L1 CAB FANS .... OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

SMOKE BULK DET FAULT ◁

Applicable to: ALL

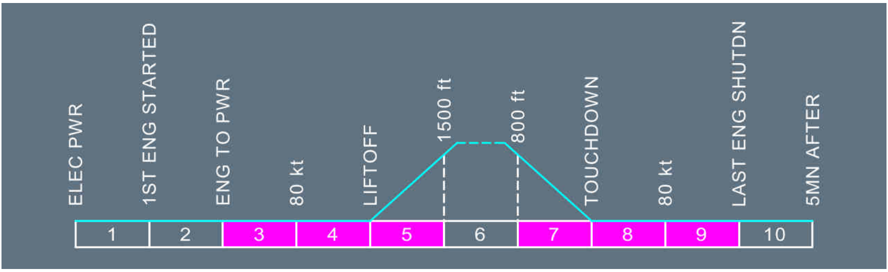
Ident.: PRO-ABN-SMOKE-S-00017582.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a smoke detection in the bulk cabin crew rest compartment is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-S-00018076.0001001 / 21 MAR 16

This alert is only applicable to aircraft equipped with IFE ◁ .

BULK REST

L2 Crew awareness that Bulk rest detection is faulty.
Bulk rest smoke detection is lost.

Ident.: PRO-ABN-SMOKE-S-00018077.0001001 / 21 MAR 16

This alert is only applicable to aircraft equipped with IFE ◁ .

STATUS

INOP SYS

BLK REST DET

SMOKE BULK REST BTL 1(2) ⩤

Applicable to: ALL

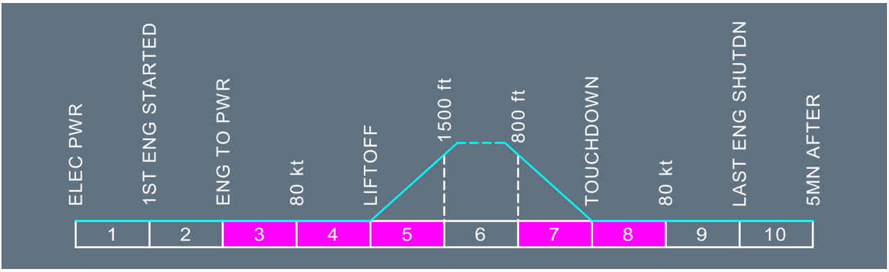
Ident.: PRO-ABN-SMOKE-AN-00017581.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a fire extinguishing bottle 1(2) in the bulk cabin crew rest compartment is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AN-00018081.0001001 / 21 MAR 16

This alert is only applicable to aircraft equipped with IFE ⩤ .

Crew awareness that Bulk Rest Bottle 1(2) is faulty.

SMOKE BULK REST SMOKE ⋞

Applicable to: ALL

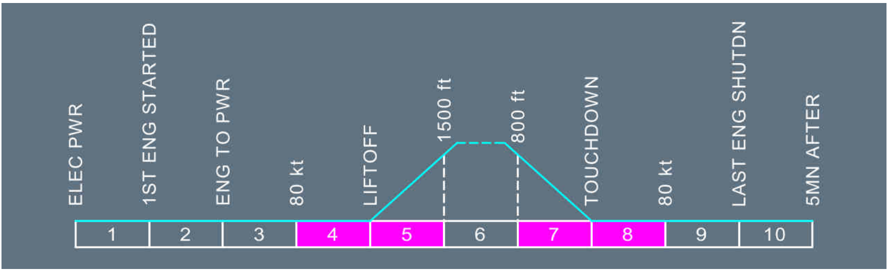
Ident.: PRO-ABN-SMOKE-AO-00017579.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the bulk area is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AO-00018101.0002001 / 17 MAR 17

CAB FANS...OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

L1 CKPT/CAB COM...ESTABLISH

L2 *Communication must be established with the cabin crew in order to follow up on the smoke origin and dissipation.*
Consider applying the SMOKE/FUMES/AVNCS SMOKE QRH procedure (Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL).

Note: *If the warning has been temporarily displayed and confirmed as a false warning by the flight and the cabin crew, turn the cabin fans on again.*

L1 ● **IF FIRE PERSISTS:**
LAND ASAP...CONSIDER

SMOKE CAB REST SMOKE ⩤

Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

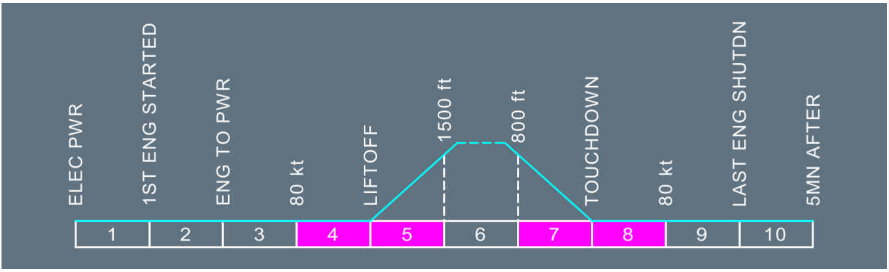
Ident.: PRO-ABN-SMOKE-AP-00017577.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the Lower Deck Mobile Crew Rest (LDMCR) or in the staircase housing is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

SMOKE CAB REST SMOKE ◁ (Cont'd)

Ident.: PRO-ABN-SMOKE-AP-00018108.0004001 / 09 MAY 17

CAB FANS....................OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

L1 CKPT/CAB COM....................ESTABLISH

L2 *Communication must be established with the cabin crew in order to follow up on the smoke origin and dissipation.*
Consider applying the SMOKE/FUMES/AVNCS SMOKE QRH procedure (Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL).

L1
- **IF FIRE PERSISTS:**

  LAND ASAP....................CONSIDER

CAB REST DOORS....................CLOSE

L2 *If it is not possible to fight the smoke source, evacuate and close the hatch. Ensure that the cabin crew have manually discharged the internal fire extinguisher, because the automatic fire extinguishing system is deactivated.*

Note: *If the warning has been temporarily displayed and confirmed as a false warning:*
1. Turn the cabin fans on again.
2. Crew rest compartment may be recovered by resetting both VENT controller channels.

L1 AFT ISOL VALVE ◁ (IF NOT AUTOMATICALLY CLOSED)....................OFF
BULK ISOL VALVE (IF NOT AUTOMATICALLY CLOSED)....................OFF

- **IF AFT+BULK CRG CLOSED (displayed on ground only):**

L2 Order the ground crew to not open the door of the affected cargo compartment, unless the passengers have disembarked and the fire services are present. Also ensure that the AFT/BULK cargo doors are closed before discharging the extinguishing agent.

L1 AFT AGENT....................DISCH

- **ON GROUND BEFORE OPEN CRG DOORS:**

  PAX....................DISEMBARK

Continued on the following page

SMOKE CAB REST SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-AP-00021527.0001001 / 09 MAY 17

STATUS

- **BEFORE OPEN CARGO DOORS (displayed only on ground):**
  PAX..DISEMBARK

INOP SYS

AFT CRG VENT
BULK VENT

SMOKE CAB REST SMOKE

Applicable to: LV-FVI, LV-KAN, LV-KAO, LV-KHU

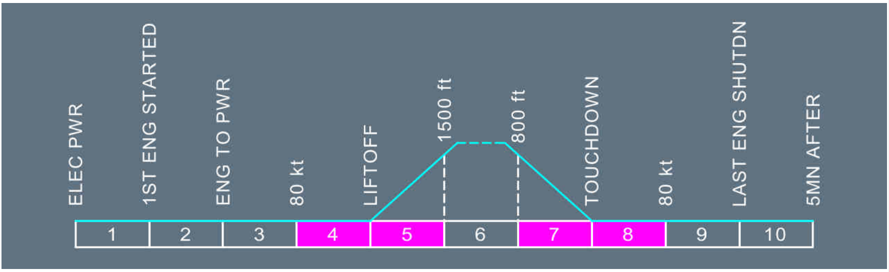
Ident.: PRO-ABN-SMOKE-AP-00017577.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the Lower Deck Mobile Crew Rest (LDMCR) or in the staircase housing is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

SMOKE CAB REST SMOKE ⏪ (Cont'd)

Ident.: PRO-ABN-SMOKE-AP-00018108.0002001 / 17 MAR 17

CAB FANS..OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

L1 CKPT/CAB COM..ESTABLISH

L2 *Communication must be established with the cabin crew in order to follow up on the smoke origin and dissipation.*
Consider applying the SMOKE/FUMES/AVNCS SMOKE QRH procedure (Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL).

L1 CAB REST DOORS..CLOSE

L2 *If it is not possible to fight the smoke source, evacuate and close the hatch. Ensure that the cabin crew have manually discharged the internal fire extinguisher, because the automatic fire extinguishing system is deactivated.*

Note: *If the warning has been temporarily displayed and confirmed as a false warning:*
1. Turn the cabin fans on again.
2. Crew rest compartment may be recovered by resetting both VENT controller channels.

SMOKE CAB VIDEO 1(2)(3)(4) SMOKE

Applicable to: ALL

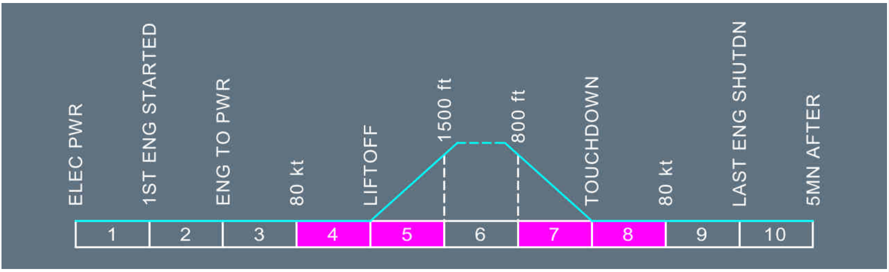
Ident.: PRO-ABN-SMOKE-AQ-00017557.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the corresponding VCC is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AQ-00015696.0002001 / 17 MAR 17

VCC ....OFF

- **If VCC pb-sw is not installed:**
  PAX SYS..OFF

CAB FANS..OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

L1 CKPT/CAB COM..ESTABLISH

L2 *The flight crew must establish the communication with the cabin crew in order to follow up on the smoke origin and dissipation.*
Consider applying the SMOKE/FUMES/AVNCS SMOKE QRH procedure (Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL).

Note: *If the warning was temporarily displayed and confirmed as a spurious warning by the flight and cabin crew, turn the cabin fans on again.*

SMOKE DET FAULT

Applicable to: ALL

Ident.: PRO-ABN-SMOKE-J-00017457.0001001 / 21 MAR 16

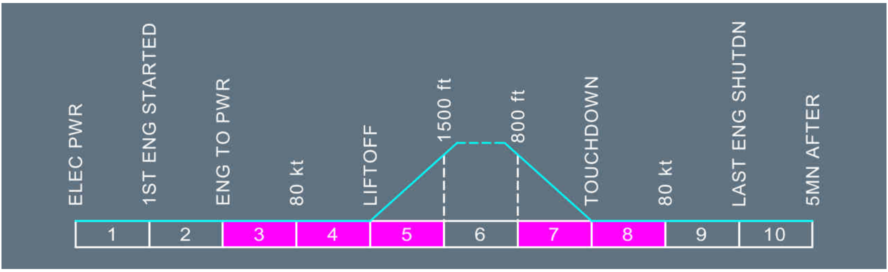
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- Both SDCU or CIDS channels are failed, or
- All smoke detectors are lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
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Continued on the following page

SMOKE DET FAULT (Cont'd)

Ident.: PRO-ABN-SMOKE-J-00018112.0001001 / 21 MAR 16

BULK AVNCS ◁ .... OFF
PAX SYS ◁ .... OFF
PAX BBAND ◁ .... OFF
IFEC ◁ .... OFF
VCC ◁ .... OFF

- **IF NO LIVESTOCK:**
  - **For A330-200/300 aircraft:**
    FWD AND AFT ISOL VALVE ◁ .... OFF
    BULK ISOL VALVE.. OFF
    FWD CRG COOLING ◁ .... OFF
  - **For A330-200F aircraft:**
    GALLEY & LAV FAN.. OFF
    MD ISOL VALVE.. OFF
    LD FWD ISOL VALVE ◁ .... OFF
    LD AFT ISOL VALVE ◁ .... OFF
    BULK ISOL VALVE.. OFF
    FWD CRG COOLING ◁ .... OFF

Ident.: PRO-ABN-SMOKE-J-00018155.0001001 / 21 MAR 16

STATUS

INOP SYS

CRG VENT ◁
MD VENT ◁ (1)
LD VENT ◁ (1)
SMOKE DET
FWD CRG TEMP ◁
AFT CRG COND ◁
LD FWD TEMP ◁ (1)
LD AFT TEMP ◁ (1)

(1) *(For A330-200F only)*

SMOKE FLT (CAB) REST DET FAULT ⋖

Applicable to: ALL

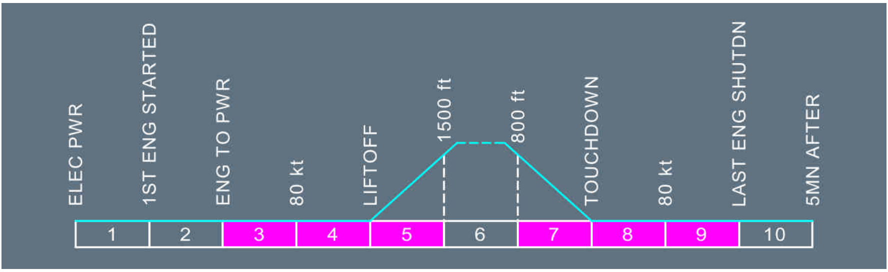
Ident.: PRO-ABN-SMOKE-M-00017578.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a smoke detection in the flight (cabin) crew rest compartment is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-M-00018157.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-SMOKE-M-00018158.0001001 / 21 MAR 16

STATUS

INOP SYS

FLT REST DET (CAB)

SMOKE FLT REST SMOKE

Applicable to: ALL

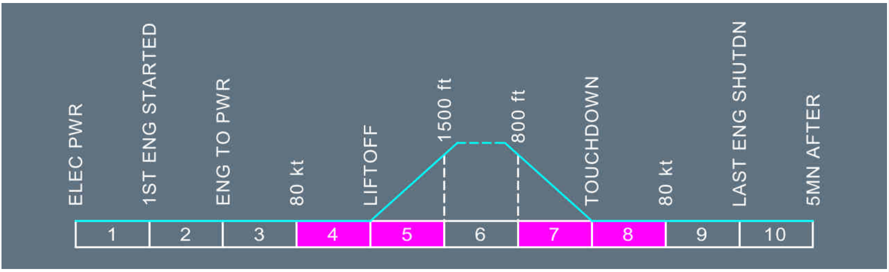
Ident.: PRO-ABN-SMOKE-AR-00017576.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the Flight Crew Rest Compartment (FCRC) is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

SMOKE FLT REST SMOKE ⩤ (Cont'd)

Ident.: PRO-ABN-SMOKE-AR-00018159.0002001 / 17 MAR 17

CAB FANS..OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

Note: If the warning has been temporarily displayed and confirmed as a false warning by the flight crew, turn the CAB FANS back ON.

L1
- **For A330-200F:**

  GALLEY & LAV FAN..OFF

  L2 *To prevent smoke from entering the Main Deck Cargo compartment.*

  Note: If the warning has been temporarily displayed and confirmed as a false warning by the flight crew, turn the CAB FANS and GALLEY & LAV FAN back ON.

L1 CKPT/CAB COM..ESTABLISH

L2 *Communication must be established with the cabin crew / occupants (if any) to follow up on the smoke origin and dissipation and take necessary actions.*
Consider applying the SMOKE/FUMES/AVNCS/MD SMOKE QRH procedure (Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL).

SMOKE FWD (AFT/BULK) CRG DET FAULT

Applicable to: ALL

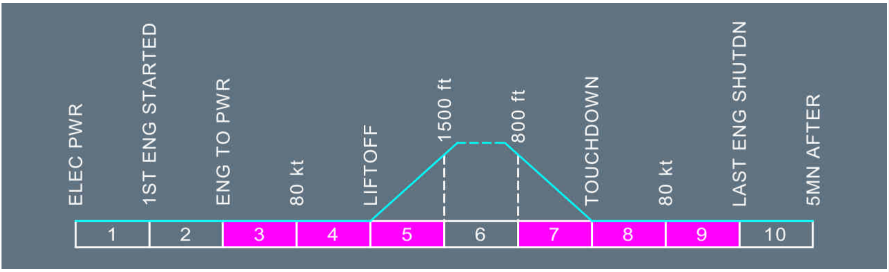
Ident.: PRO-ABN-SMOKE-H-00017537.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a smoke detection in the corresponding cargo compartment is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-H-00018433.0001001 / 21 MAR 16

- **IF NO LIVESTOCK:**

  ISOL VALVE ◁ (AFFECTED COMPARTMENT)....................OFF
  BULK ISOL VALVE....................OFF
  FWD CRG COOLING ◁ ....OFF

Ident.: PRO-ABN-SMOKE-H-00018434.0001001 / 21 MAR 16

STATUS

INOP SYS

FWD CRG DET (AFT) (BULK)
FWD CRG TEMP ◁
FWD CRG VENT ◁ (AFT)
BULK VENT

SMOKE FWD CRG SMOKE

Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

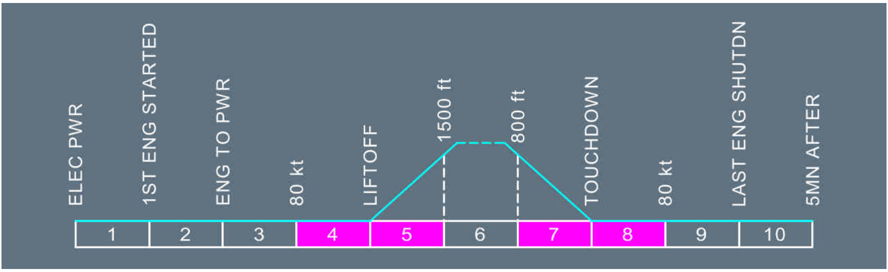
Ident.: PRO-ABN-SMOKE-F-00017532.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the FWD cargo compartment is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

SMOKE FWD CRG SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-F-00018441.0002001 / 03 NOV 23

LAND ASAP

FWD ISOL VALVE (IF NOT AUTOMATICALLY CLOSED).. OFF

- **IF FWD CRG CLOSED (displayed on ground only):**
  FWD AGENT.. DISCH

CAB FANS...OFF

- **ON GROUND BEFORE OPEN CRG DOORS:**
  PAX.. DISEMBARK

L2

1. Expect the SMOKE warning to remain after agent discharge, even if the smoke source is extinguished. Gases from smoke source are not evacuated, and smoke detectors are also sensitive to the extinguishing agent.
   Once the isolation valves are closed, the cargo is not ventilated. Therefore, the cargo temperature is unreliable
2. When ventilation is required for livestock transportation, the normal cargo ventilation may be recovered if:

   - The warning is displayed temporarily
   - The agent is not discharged.

   The normal cargo ventilation is recovered by resetting the cargo ventilation system by using the VENT CONT LANE 1 and LANE 2 reset buttons
3. If the SMOKE warning is displayed on ground, with the cargo compartment door open, do not initiate AGENT DISCHARGE. Request the ground crew to investigate and eliminate the smoke source
4. On ground, the warning may be triggered due to a high level of humidity or insecticide spraying. Provided that the smoke is not visually confirmed:
   - Deactivate the smoke detection system, by pulling the SDCU 1 and 2 reset pb-sw
   - Reset the cargo ventilation system, using the VENT CONT LANE 1 and LANE 2 reset buttons at the same time for a minimum of 5 s (but less than 10 s to avoid automatic shut-down of the IFE system)
   - At cargo doors closure, reactivate SDCU 1 and 2.

Continued on the following page

SMOKE FWD CRG SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-F-00018442.0003001 / 21 MAR 16

STATUS

- **BEFORE OPEN CRG DOORS (displayed on ground only):**
  PAX...DISEMBARK

INOP SYS

FWD CRG VENT

SMOKE FWD CRG SMOKE

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

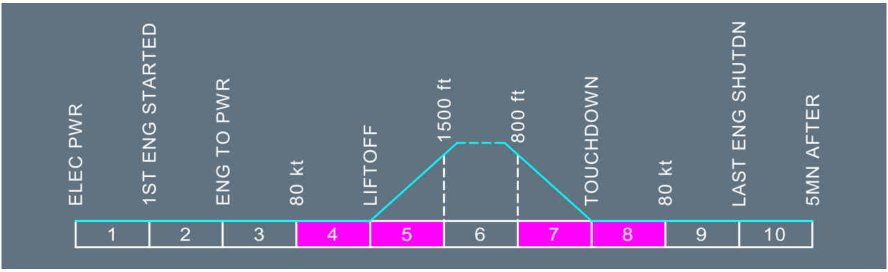
Ident.: PRO-ABN-SMOKE-F-00017532.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the FWD cargo compartment is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Continued on the following page

SMOKE FWD CRG SMOKE (Cont'd)

Ident.: PRO-ABN-SMOKE-F-00018441.0003001 / 03 NOV 23

LAND ASAP

FWD ISOL VALVE ⩤ (IF NOT AUTOMATICALLY CLOSED).. OFF

- **IF FWD CRG CLOSED (displayed on ground only):**

  FWD AGENT.. DISCH

CAB FANS...OFF

- **ON GROUND BEFORE OPEN CRG DOORS:**

  PAX.. DISEMBARK

L2

1. Expect the SMOKE warning to remain after agent discharge, even if the smoke source is extinguished. Gases from smoke source are not evacuated, and smoke detectors are also sensitive to the extinguishing agent.
   Once the isolation valves are closed, the cargo is not ventilated. Therefore, the cargo temperature is unreliable
2. When ventilation is required for livestock transportation, the normal cargo ventilation may be recovered if:
   - The warning is displayed temporarily
   - The agent is not discharged.

   The normal cargo ventilation is recovered by resetting the cargo ventilation system by using the VENT CONT LANE 1 and LANE 2 reset buttons
3. If the SMOKE warning is displayed on ground, with the cargo compartment door open, do not initiate AGENT DISCHARGE. Request the ground crew to investigate and eliminate the smoke source
4. On ground, the warning may be triggered due to a high level of humidity or insecticide spraying.

Ident.: PRO-ABN-SMOKE-F-00018442.0003001 / 21 MAR 16

STATUS

	INOP SYS
● **BEFORE OPEN CRG DOORS (displayed on ground only):** PAX...DISEMBARK	FWD CRG VENT ⩤

SMOKE IFE BAY DET FAULT ⩤

Applicable to: ALL

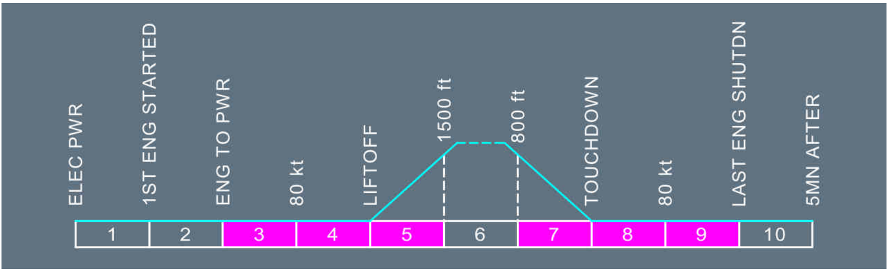
Ident.: PRO-ABN-SMOKE-AE-00017559.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a smoke detection in the IFE bay is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AE-00015699.0001001 / 05 JAN 15

L2 Smoke detection is lost in the IFE bay.

L1 IFEC ⩤ .... OFF

- **If IFEC pb-sw is not installed:**
  PAX SYS .... OFF

Ident.: PRO-ABN-SMOKE-AE-00015701.0001001 / 05 JAN 15

STATUS

INOP SYS

IFE BAY DET

SMOKE IFE BAY SMOKE ◁

Applicable to: ALL

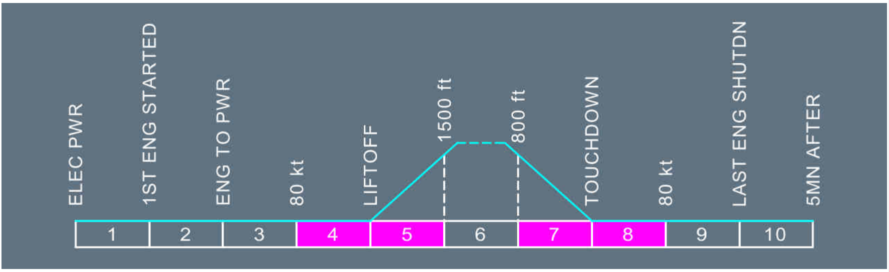
Ident.: PRO-ABN-SMOKE-AS-00017560.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the IFE bay is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AS-00015702.0002001 / 05 JAN 15

LAND ASAP

IFEC ◁ ....OFF

- **If IFEC pb-sw is not installed:**

  PAX SYS..OFF

CAB FANS..OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

L1 CKPT/CAB COM..ESTABLISH

L2 *The flight crew must establish the communication with the cabin crew in order to follow up on the smoke origin and dissipation.*

SMOKE LAVATORY DET FAULT

Applicable to: ALL

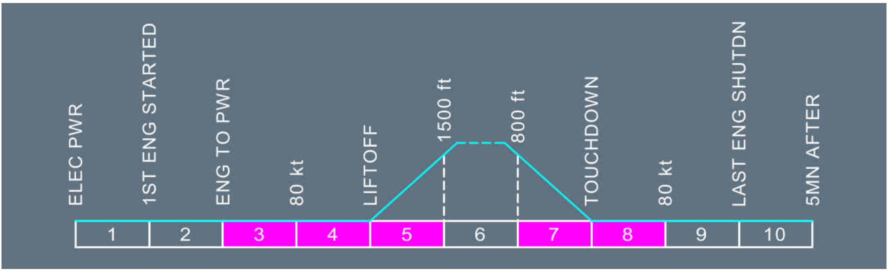
Ident.: PRO-ABN-SMOKE-I-00017478.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when there is a loss of smoke detection in at least one of the lavatory.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-I-00018449.0001001 / 21 MAR 16

Crew awareness.

Ident.: PRO-ABN-SMOKE-I-00011647.0001001 / 18 AUG 10

STATUS

INOP SYS

LAV DET

SMOKE LAVATORY SMOKE

Applicable to: ALL

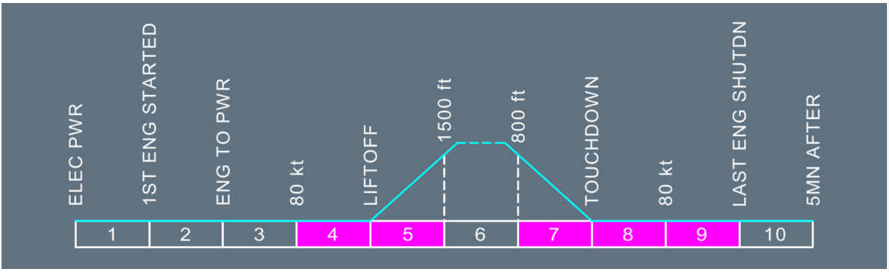
Ident.: PRO-ABN-SMOKE-AU-00017475.0003001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in a lavatory is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AU-00018450.0001001 / 21 MAR 17

CKPT/CAB COM.....ESTABLISH

L2 *Communication must be established with the cabin crew in order to follow up on the smoke origin and dissipation.*
Refer to PRO-ABN-SMOKE [QRH] SMOKE / FUMES / AVNCS SMOKE - GENERAL.

SMOKE FWD (AFT) CRG BTL 1(2) FAULT

Applicable to: ALL

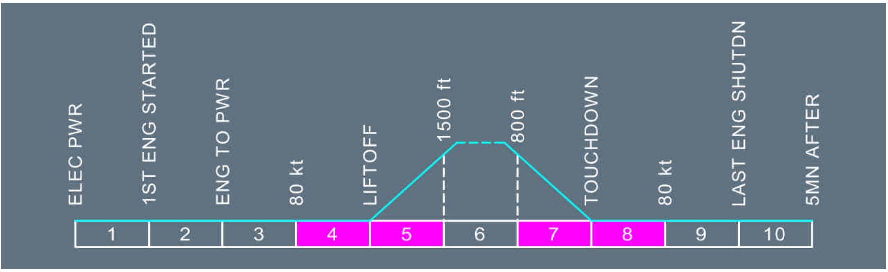
Ident.: PRO-ABN-SMOKE-AV-00017536.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the FWD or AFT BTL 1(2) is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
1
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Ident.: PRO-ABN-SMOKE-AV-00018474.0002001 / 22 MAR 17

Crew awareness.

L2
- If bottle 1 is lost, fire-extinguishing capability is lost in the affected compartment.
- If bottle 2 is lost, agent concentration will not be ensured after fire extinguishing.

SMOKE PAX BBAND SMOKE

Applicable to: ALL

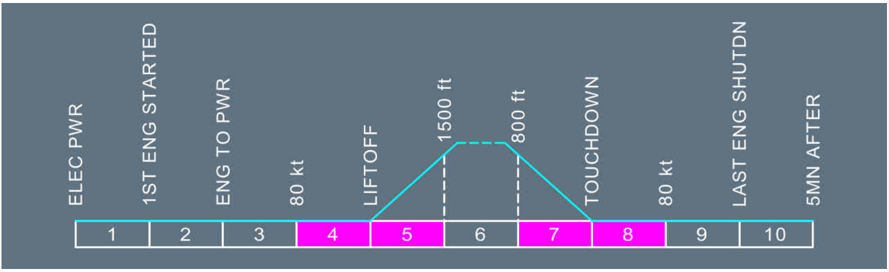
Ident.: PRO-ABN-SMOKE-AX-00017563.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when smoke in the ventilation duct of the Broadband system is detected.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AX-00015703.0002001 / 05 JAN 15

LAND ASAP

PAX BBAND..OFF
CAB FANS..OFF

L2 *To prevent smoke from entering the cockpit and cabin.*

L1 CKPT/CAB COM..ESTABLISH

L2 *The flight crew must establish the communication with the cabin crew in order to follow up on the smoke origin and dissipation.*

Note: *If the warning has been temporarily displayed and confirmed as a false warning by the flight and cabin crew, turn the cabin fans on again.*

SMOKE VIDEO 1(2)(3)(4) DET FAULT ⩤

Applicable to: ALL

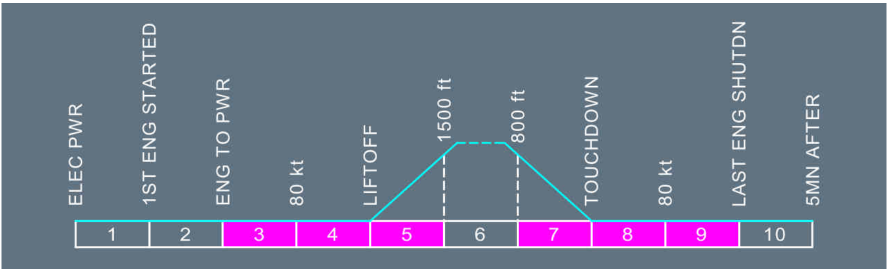
Ident.: PRO-ABN-SMOKE-AC-00017558.0002001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when a smoke detection in the corresponding VCC is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SMOKE-AC-00015704.0001001 / 05 JAN 15

L2 Smoke detection is lost in the corresponding VCC.

L1 VCC ⩤ .... OFF

- **If VCC pb-sw is not installed:**

  PAX SYS.. OFF

Ident.: PRO-ABN-SMOKE-AC-00015706.0001001 / 05 JAN 15

STATUS

INOP SYS

VIDEO 1(2)(3)(4) DET

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[MEM] EGPWS CAUTIONS

Ident.: PRO-ABN-SURV-00019378.0003001 / 04 DEC 18
Applicable to: ALL

■ "TERRAIN TERRAIN" - "TOO LOW TERRAIN" - "TERRAIN AHEAD" - "OBSTACLE AHEAD"

■ During night or IMC:

Simultaneously:

AP....................OFF
PITCH....................PULL UP

L2 Pull to full backstick and maintain in that position.

L1
THRUST LEVERS....................TOGA
SPEEDBRAKE lever....................CHECK RETRACTED
BANK....................WINGS LEVEL or ADJUST

L2 Aircraft obtain the best climb performance when the wings are as level as possible. The flight crew can adjust bank while climbing, provided that turning is the safest action.

L1 *Note: For some airports, the operator may define a specific procedure.*

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL CLEAR OF OBSTACLE.

■ During daylight and VMC, with terrain and obstacles clearly in sight:

FLIGHT PATH....................ADJUST

L2 Adjust pitch, bank and thrust to silence the alert.

L1 *Note: For some airports, the operator may define a specific procedure.*

■ "SINK RATE"

■ Above 1 000 ft AAL in IMC or above 500 ft AAL in VMC:

FLIGHT PATH....................ADJUST

L2 Adjust pitch and thrust to silence the alert.

L1

■ Below 1 000 ft AAL in IMC or below 500 ft AAL in VMC:

GO-AROUND....................CONSIDER

Continued on the following page

[MEM] EGPWS CAUTIONS (Cont'd)

- **"DON'T SINK"**

FLIGHT PATH..ADJUST

L2 Adjust pitch and thrust to silence the alert.

L1
- **"TOO LOW GEAR" - "TOO LOW FLAPS"**

GO-AROUND..PERFORM

- **"GLIDE SLOPE"**
  - **Above 1 000 ft AAL in IMC or above 500 ft AAL in VMC:**

FLIGHT PATH..ADJUST

L2 Adjust pitch and thrust to reduce the vertical deviation from the glideslope.

L1
- **When conditions require a deliberate approach below glideslope:**

G/S MODE..OFF

- **Below 1 000 ft AAL in IMC or below 500 ft AAL in VMC:**

GO-AROUND..CONSIDER

[MEM] EGPWS WARNINGS

Ident.: PRO-ABN-SURV-00017168.0003001 / 04 DEC 18
Applicable to: ALL

- **"PULL UP" - "TERRAIN AHEAD PULL UP" - "OBSTACLE AHEAD PULL UP"**

Simultaneously:

AP..OFF
PITCH..PULL UP

L2 Pull to full backstick and maintain in that position.

L1
THRUST LEVERS..TOGA
SPEEDBRAKE lever..CHECK RETRACTED
BANK..WINGS LEVEL or ADJUST

L2 Aircraft obtain the best climb performance when the wings are as level as possible. The flight crew can adjust bank while climbing, provided that turning is the safest action.

L1
DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL CLEAR OF OBSTACLE.

[MEM] TCAS CAUTION - TRAFFIC ADVISORY

Ident.: PRO-ABN-SURV-00025042.0002001 / 13 MAY 22
Applicable to: LV-KAN, LV-KAO

L2 If the AP/FD TCAS mode is available, the TCAS mode arms on FMA.

L1 TCAS mode..CHECK ARMED

L2 If the AP/FD TCAS mode does not arm, the flight crew must be prepared to disconnect the AP in the case of a RA, and manually follow the TCAS guidances.

L1 ● **If the A/THR is off:**

AUTOTHRUST..ON

L2 It is recommended to set the A/THR to ON in order to avoid the AUTO FLT A/THR LIMITED alert at the automatic A/THR activation that occurs in the case of a RA.

L1 Do not perform a maneuver based on a TA alone.

[MEM] TCAS CAUTION - TRAFFIC ADVISORY

Ident.: PRO-ABN-SURV-00025042.0001001 / 13 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

Do not perform a maneuver based on a TA alone.

[MEM] TCAS WARNING - RESOLUTION ADVISORY

Ident.: PRO-ABN-SURV-00011464.0007001 / 17 MAY 22
Applicable to: LV-KAN, LV-KAO

Always follow RA orders, even if this results in crossing the intruder altitude, because these orders ensure the best altitude separation.

CAUTION	Be aware that the intruder may have a TCAS, and may maneuver in response to a coordinated RA order. Therefore, not following an RA order could compromise safe separation.

■ **If the AP/FD TCAS mode is available:**

L2 The flight crew applies this procedure, when a RA triggered, and the AP/FD TCAS mode is engages. The AP/FD TCAS mode follows the RA orders.

L1
- **All RA, except any CLIMB RA during approach in CONF 3 or FULL:**
  - **If the AP is OFF:**

    FD ORDERS.. FOLLOW

    The AP can be engaged.

  VERTICAL SPEED.. MONITOR

L2 If a preventive RA was triggered: check that the vertical speed remains out of the red area of the vertical speed scale.

If a corrective RA was triggered: check that the vertical speed gets out of the red area, and remains in the green area of the vertical speed scale.

L1

CAUTION	If for any reason during a RA, the aircraft vertical speed does not reach the green area of the vertical speed scale, the PF should disconnect the AP, and override the FD orders, in order to lead the aircraft vertical speed out of the red area of the vertical speed scale. If necessary, the PF must use the full speed range between Vαmax and VMAX.

- **Any CLIMB RA during approach in CONF 3 or FULL:**

  GO-AROUND.. PERFORM

L2 The AP/FD TCAS mode disengages (the AP/FD does no longer follows the RA orders).

L1 Follow the SRS GA mode.

VERTICAL SPEED.. MONITOR

Continued on the following page

[MEM] TCAS WARNING - RESOLUTION ADVISORY (Cont'd)

L2 Check that the vertical speed remains out of the red area of the vertical speed scale and take over if necessary.

L1 Respect stall, GPWS or windshear warnings.

ATC....................NOTIFY

- **When the "CLEAR OF CONFLICT" aural alert sounds:**

L2 The AP/FD TCAS mode, if engaged, disengages.

L1
AP/FD....................MONITOR/FOLLOW
ATC....................NOTIFY
LATERAL AND VERTICAL GUIDANCE....................ADJUST

L2 The flight crew should engage an appropriate vertical mode, or adjust the vertical speed target, in accordance with the latest ATC clearance.

L1 SPEED....................ADJUST

L2 The flight crew should adjust the speed target, and revert to managed speed, as appropriate.

L1 ■ **If the AP/FD TCAS mode is not available:**

L2 The flight crew must apply this procedure, when a RA is triggered, and the AP/FD TCAS mode does not engage.

L1
- **All RA, except CLIMB RA during approach in CONF 3 or FULL:**

AP (if engaged)....................OFF
BOTH FDs....................OFF

Respond promptly and smoothly.

VERTICAL SPEED....................ADJUST or MAINTAIN

L2 Adjusting or maintain the vertical speed as required, to reach the green area and/or avoid the red area of the vertical speed scale.

L1 *Note:* *Avoid excessive maneuvers while attempting to maintain the vertical speed just outside the red area of the vertical speed scale, and within the green area. If necessary, use the full speed range between Vαmax and VMAX.*

- **Any CLIMB RA during approach in CONF 3 or FULL:**

GO-AROUND....................PERFORM

Follow the SRS GA mode.

Continued on the following page

[MEM] TCAS WARNING - RESOLUTION ADVISORY (Cont'd)

VERTICAL SPEED....................MONITOR

L2 Check that the vertical speed remains out of the red area of the vertical speed scale and take over if necessary.

L1 Respect stall, GPWS or windshear warnings.

ATC....................NOTIFY

- **When the “CLEAR OF CONFLICT” aural alert sounds:**

ATC....................NOTIFY
LATERAL AND VERTICAL GUIDANCE....................ADJUST

L2 Adjust the lateral and vertical guidance to resume normal navigation, in accordance with ATC clearance.

L1 AP/FD....................AS RQRD

L2 If necessary, reengage the AP/FD.

[MEM] TCAS WARNING - RESOLUTION ADVISORY

Ident.: PRO-ABN-SURV-00011464.0005001 / 17 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

Always follow RA orders, even if this results in crossing the intruder altitude, because these orders ensure the best altitude separation.

CAUTION	Be aware that the intruder may have a TCAS, and may maneuver in response to a coordinated RA order. Therefore, not following an RA order could compromise safe separation.

- **All RA, except any CLIMB RA during approach in CONF 3 or FULL:**

AP (if engaged).. OFF
FDs.. OFF

Respond promptly and smoothly.

VERTICAL SPEED.. ADJUST or MAINTAIN

L2 Adjust or maintain the vertical speed as required, depending on the green area, and/or to avoid the red area of the vertical speed scale.

L1 *Note:* *Avoid excessive maneuvers while attempting to maintain the vertical speed just outside the red area of the vertical speed scale, and within the green area. If necessary, use the full speed range between Vαmax and VMAX.*

- **Any CLIMB RA during approach in CONF 3 or FULL:**

GO-AROUND.. PERFORM

Follow the SRS GA mode.

VERTICAL SPEED.. MONITOR

L2 Check that the vertical speed remains out of the red area of the vertical speed scale and take over if necessary.

L1 Respect stall, GPWS, or windshear warnings.

ATC.. NOTIFY

- **When the “CLEAR OF CONFLICT” aural alert sounds:**

ATC.. NOTIFY
LATERAL AND VERTICAL GUIDANCE.. ADJUST

L2 Adjust the lateral and vertical guidance to resume normal navigation, in accordance with ATC clearance.

Continued on the following page

[MEM] TCAS WARNING - RESOLUTION ADVISORY (Cont'd)

L1

AP/FD..AS RQRD

L2

If necessary, reengage the AP/FD.

[MEM] WINDSHEAR WARNING - REACTIVE WINDSHEAR

Ident.: PRO-ABN-SURV-00012300.0001001 / 04 NOV 20
Applicable to: ALL

If Windshear is detected, both PFDs display a WINDSHEAR message. An associated aural WINDSHEAR alert sounds three times.

If the flight crew detects WINDSHEAR, apply the following recovery technique:

■ Takeoff:

● If before V1:

If there are significant variations in airspeed, and in airspeed trend below the indicated V1, reject the takeoff.

L2 *If windshear occurs during the takeoff roll, the aircraft may reach V1 later (or sooner) than expected. The flight crew should ensure that there is sufficient runway remaining to stop the aircraft, if necessary.*

L1 **● If after V1:**

THR LEVERS....................TOGA
REACHING VR....................ROTATE
SRS ORDERS....................FOLLOW

If necessary, the flight crew may pull the sidestick fully back.

Note: If the FD bars are not displayed, move toward an initial pitch attitude of 17.5 °. Then, if necessary to prevent a loss of altitude, increase the pitch attitude.

■ Airborne - initial climb or landing:

THR LEVERS AT TOGA....................SET OR CONFIRM
AP (if engaged)....................KEEP ON
SRS ORDERS....................FOLLOW

If necessary, the flight crew may pull the sidestick fully back.

Note: 1. The autopilot disengages, if the angle of attack value goes above alpha prot.
2. If the FD bars are not displayed, move toward an initial pitch attitude of 17.5 °. Then, if necessary to prevent a loss of altitude, increase the pitch attitude.

DO NOT CHANGE CONFIGURATION (SLATS/FLAPS, GEAR) UNTIL OUT OF WINDSHEAR.

CLOSELY MONITOR THE FLIGHT PATH AND THE SPEED.

SMOOTHLY RECOVER TO NORMAL CLIMB OUT OF WINDSHEAR.

SURV ROW/ROP LOST

Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

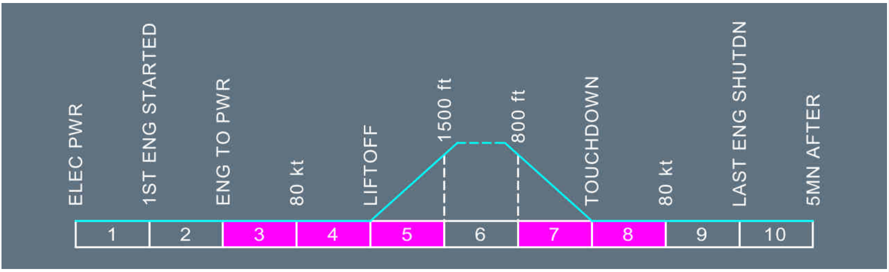
Ident.: PRO-ABN-SURV-AI-00018481.0001001 / 26 NOV 19

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the ROW/ROP is lost.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-SURV-AI-00016119.0001001 / 23 JUN 15

Crew awareness.

Ident.: PRO-ABN-SURV-AI-00019094.0001001 / 17 MAR 16

STATUS

INOP SYS

ROW/ROP

T.O SPEEDS NOT INSERTED

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

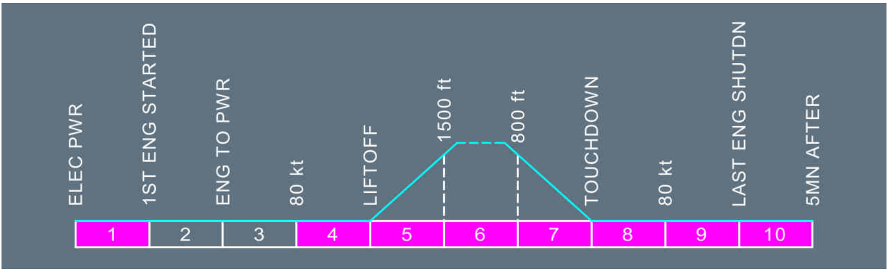
Ident.: PRO-ABN-T-O-M-00017825.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the take off speeds are not inserted.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-T-O-M-00016641.0001001 / 09 DEC 15

Crew awareness.

T.O SPEEDS TOO LOW

Applicable to: LV-FVI, LV-KAN, LV-KAO

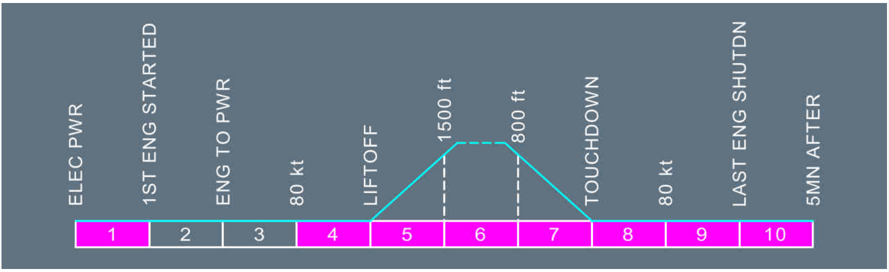
Ident.: PRO-ABN-T-O-N-00017824.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the take off speeds are too low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-T-O-N-00016642.0001001 / 09 DEC 15

TOW AND T.O DATA...CHECK

T.O SPEEDS TOO LOW

Applicable to: LV-FVH, LV-GHQ, LV-GIF

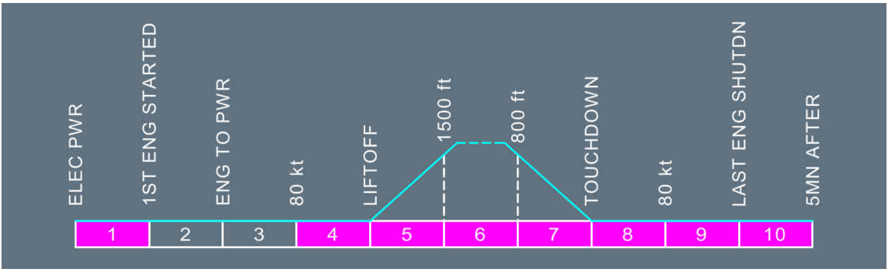
Ident.: PRO-ABN-T-O-N-00017824.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the take off speeds are too low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-T-O-N-00016642.0003001 / 04 JUL 17

TOW & T.O DATA..CHECK

T.O V1/VR/V2 DISAGREE

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

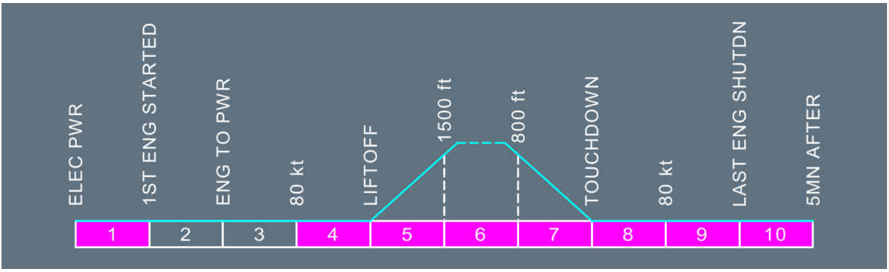
Ident.: PRO-ABN-T-O-O-00017823.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when V1, VR, and V2 disagree.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-T-O-O-00016643.0001001 / 09 DEC 15

Crew awareness.

VENT BLOWING FAULT

Applicable to: ALL

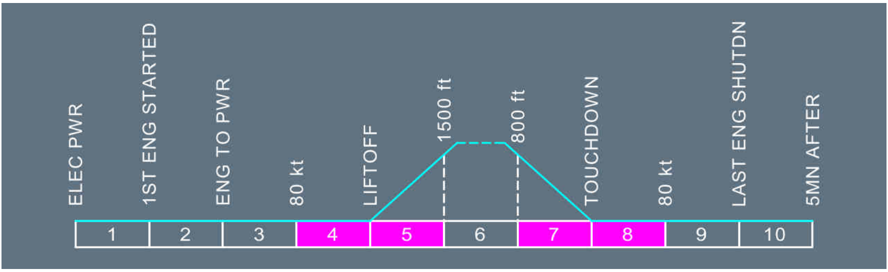
Ident.: PRO-ABN-VENT-R-00017493.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the cooling capacity of the avionics ventilation blown air is abnormal.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Note: Associated with ground external horn triggered after a time delay.

Ident.: PRO-ABN-VENT-R-00018284.0001001 / 21 MAR 16

PACK FLOW..HI

L2 *To increase the airflow.*

L1 CAB FANS..ON

COCKPIT TEMP..DECREASE

CABIN TEMP..DECREASE

L2 *To decrease the temperature of the recirculated air.*

L1 ● **IF WARNING AFTER 5 MIN:**

MAX FLT TIME..5 HOURS

L2 *Note: This flight time limitation intends to prevent premature failures of some minor equipment (IFE, cabin communication ...) that may occur after 5 h with a BLOWING FAULT caution. This limitation is not applicable to other equipment.*

Continued on the following page

VENT BLOWING FAULT (Cont'd)

Ident.: PRO-ABN-VENT-R-00018285.0001001 / 21 MAR 16

STATUS

- **If the warning is still displayed after 5 min:**
  MAX FLT TIME..5 HOURS

INOP SYS

VENT BLOWING

VENT EXTRACT FAULT

Applicable to: ALL

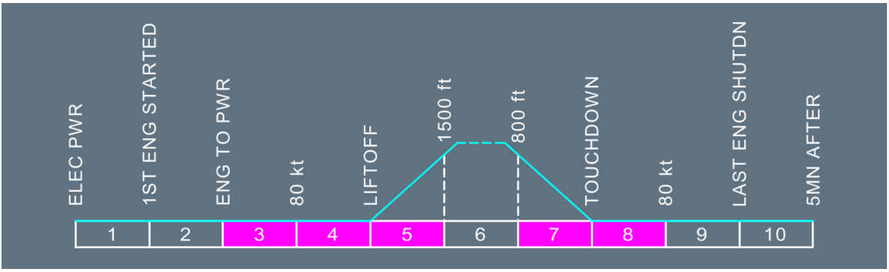
Ident.: PRO-ABN-VENT-S-00017495.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the avionics ventilation extract flow is low.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Note: Associated with ground external horn triggered after a time delay.

Continued on the following page

VENT EXTRACT FAULT (Cont'd)

Ident.: PRO-ABN-VENT-S-00010963.0001001 / 03 NOV 23

Note: To reset the AEVC computer, make sure that the EXTRACT pb-sw is set to AUTO position. This may clear the VENT EXTRACT FAULT, only if it is triggered on ground at engine start.

EXTRACT..OVRD

L2 *Air is blown through the overboard extract valve, which is partially open.*
The underfloor extract valve is closed.

Ident.: PRO-ABN-VENT-S-00010964.0001001 / 17 AUG 10

STATUS

INOP SYS

VENT EXTRACT

VENT GND COOL FAULT ⩤

Applicable to: ALL

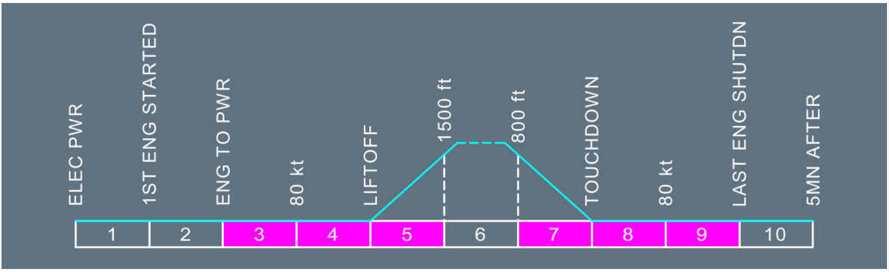
Ident.: PRO-ABN-VENT-V-00017506.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the Ground Refrigeration Unit (GRU), fan or ground cool valve is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-VENT-V-00018286.0002001 / 21 MAR 17

GND COOL.. OFF

- **IF SKIN VALVE STILL OPEN:**
  - MAX FL..100/MEA-MORA
  - CAB PR MODE SEL..MAN
  - CAB PR VALVE SEL..BOTH
  - MAN V/S CTL.. FULL UP

L2 *Pressurization is inhibited to avoid damage to the ducts.*
It may take 10 s in manual mode before the crew notices a change in the outflow valve position.

Ident.: PRO-ABN-VENT-V-00018287.0002001 / 21 MAR 17

STATUS

	INOP SYS
MAX FL........................100/MEA-MORA	GND COOL

VENT OVBD VALVE FAULT

Applicable to: ALL

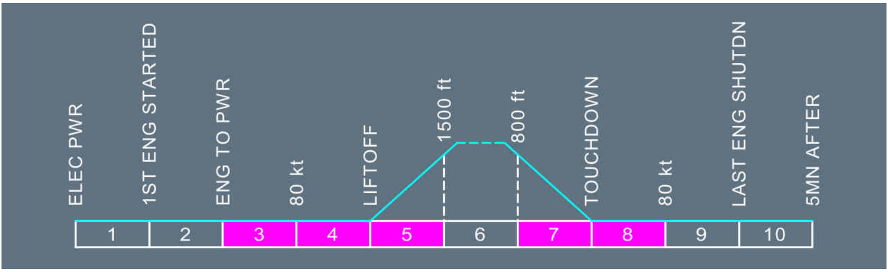
Ident.: PRO-ABN-VENT-T-00017497.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the overboard extract valve is open at engine start or not partially open after override.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-VENT-T-00010965.0002001 / 03 NOV 23

Note: *To reset the AEVC computer, make sure that the EXTRACT pb-sw is set to AUTO position. This may clear the VENT OVBD VALVE FAULT, only if it is triggered on ground at engine start.*

EXTRACT...OVRD

- **IF OVBD STILL FULL OPEN:**

  MAX FL...100/MEA-MORA

  CAB PR MODE SEL...MAN

  CAB PR VALVE SEL...BOTH

  MAN V/S CTL...FULL UP

L2 *Pressurization is inhibited to avoid damage to the ducts.*
It may take 10 s in manual mode before the crew notices a change in the outflow valve position.

Continued on the following page

VENT OVBD VALVE FAULT (Cont'd)

Ident.: PRO-ABN-VENT-T-00010966.0002001 / 21 MAR 17

STATUS

MAX FL...100/MEA-MORA	**INOP SYS** OVBD VALVE

VENT PACK BAY VENT FAULT

Applicable to: ALL

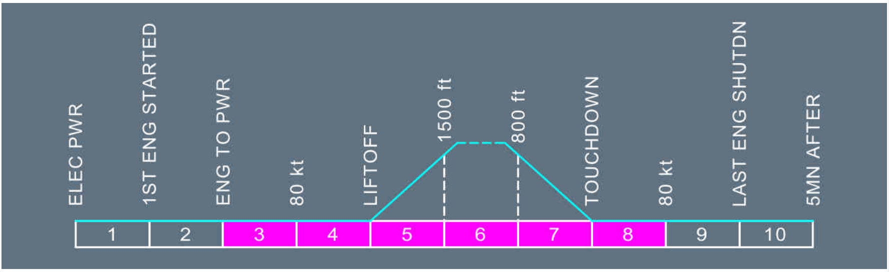
Ident.: PRO-ABN-VENT-U-00017499.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers on ground when low ΔP is detected across the turbofan, and at least one pack is operating.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Note: Associated with ground external horn triggered after a time delay.

Ident.: PRO-ABN-VENT-U-00018293.0001001 / 21 MAR 16

ONE PACK...OFF

Continued on the following page

VENT PACK BAY VENT FAULT (Cont'd)

Ident.: PRO-ABN-VENT-U-00018294.0001001 / 21 MAR 16

STATUS

- **On ground:**
  BOTH PACKS AVAIL IN FLT

INOP SYS

PACK 1 or 2
PACKBAY VENT
FWD CRG TEMP ◁

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[QRH] WHEEL TIRE DAMAGE SUSPECTED

Ident.: PRO-ABN-WHEEL-00019865.0001001 / 17 MAR 17
Applicable to: ALL

The flight crew must apply the WHEEL TIRE DAMAGE SUSPECTED procedure in the case of suspicion of damage on one or several tires.
There are several ways described in the FCTM to determine that one or several tires are damaged, *Refer to FCTM/PR-AEP-LG Wheel Tire Damaged Suspected*.

LDG DIST PROC...APPLY

Performance impact of one burst tire is equivalent to one brake released.

TAXI WITH CARE

Refer to LIM-LG Taxi with Deflated or Damaged Tires.

WHEEL HYD SEL VALVE

Applicable to: ALL

Ident.: PRO-ABN-WHEEL-Q-00018146.0001001 / 21 MAR 16

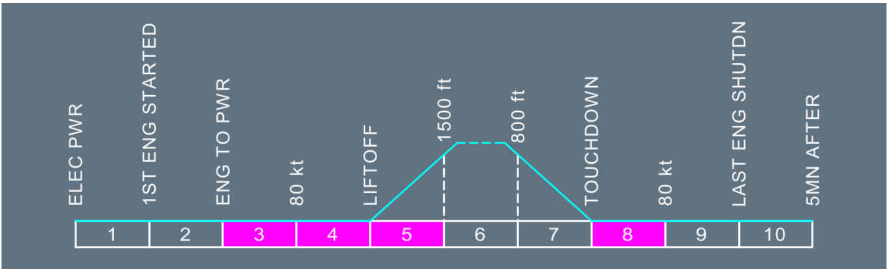
ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when:

- The normal selector valve is failed, or
- The steering selector valve is failed in the open position.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
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TOUCHDOWN
80 kt
LAST ENG SHUTDN
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Continued on the following page

WHEEL HYD SEL VALVE (Cont'd)

Ident.: PRO-ABN-WHEEL-Q-00018710.0001001 / 21 MAR 16

- L2 If the normal brake selector valve is failed open, full green hydraulic pressure is present at normal servovalves' entry.
  Nosewheel steering remains available.
- L2 On ground, do not tow the aircraft with the green hydraulic system pressurized : If the steering selector valve is failed open, nosewheel steering remains pressurized, and so towing may either break the towbar's shear pin, or the nose gear (if towbarless towing).
- L2 If the steering selector valve is failed open, setting A/SKID & N/W STRG sw to OFF will cause the nosewheel to go to maximum deflection.

L1 A/SKID N/WS.. KEEP ON

L2 *As long as antiskid is operative, brake pressure is regulated by normal servovalves*

Ident.: PRO-ABN-WHEEL-Q-00018711.0001001 / 21 MAR 16

STATUS

A/SKID N/WS...KEEP ON

WHEEL N/W STRG FAULT

Applicable to: ALL

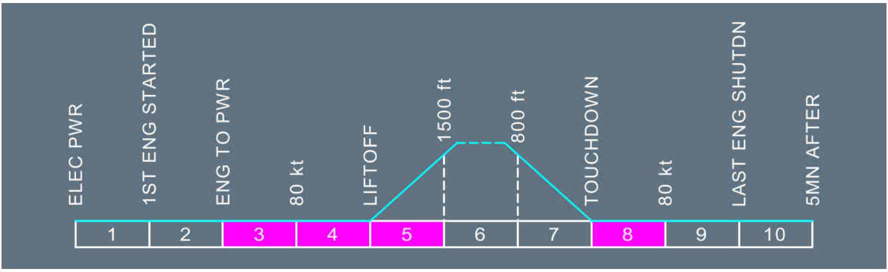
Ident.: PRO-ABN-WHEEL-S-00018148.0001001 / 21 MAR 16

ANNUNCIATIONS

Triggering Conditions:

L2 This alert triggers when the nose wheel steering system is failed.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
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LIFTOFF
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TOUCHDOWN
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LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-WHEEL-S-00010799.0001001 / 25 FEB 14

Crew awareness.

Ident.: PRO-ABN-WHEEL-S-00010800.0001001 / 21 MAR 16

L12

STATUS	INOP SYS
CAT 3 SINGLE ONLY *See* (1)	CAT 3 DUAL N/W STRG

(1) Note: *Automatic rollout is not authorized (Refer to QRH/OPS Required Equipment for CAT2 and CAT3).*

WHEEL TIRE LO PR

Applicable to: ALL

Ident.: PRO-ABN-WHEEL-AF-00018149.0004001 / 21 MAR 16

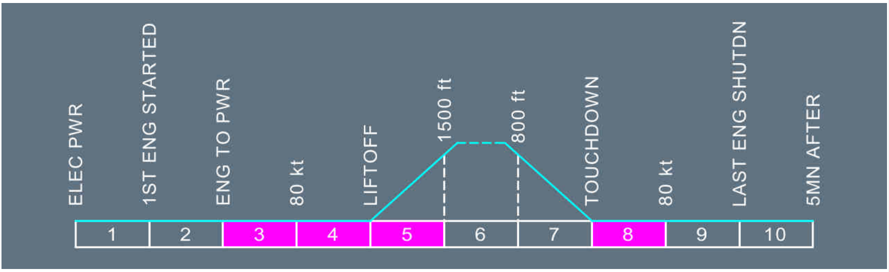
ANNUNCIATIONS

Triggering Conditions:

L2

This alert triggers when one of the following cases occur:
- One tire pressure is below:
  - 74 % of nominal pressure between liftoff and engines shutdown, or
  - 89 % of nominal pressure in other cases.
- There is a difference of pressure between two wheels of the same axle that is higher than:
  - 21 % of nominal pressure between liftoff and engines shutdown, or
  - 15 % of nominal pressure in other cases.

Flight Phase Inhibition:


ELEC PWR
1ST ENG STARTED
ENG TO PWR
80 kt
LIFTOFF
1500 ft
800 ft
TOUCHDOWN
80 kt
LAST ENG SHUTDN
5MN AFTER
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Ident.: PRO-ABN-WHEEL-AF-00019192.0001001 / 21 MAR 16

Crew awareness.

GENERAL

Ident.: PRO-ABN-90-00010100.0001001 / 17 MAR 11
Applicable to: ALL

A successful outcome of an emergency situation depends, first of all, upon each crewmember's perfect knowledge and execution of the duties assigned to him/her.
The captain should frequently check that all crew members know exactly their assigned positions and their specific duties, as well as the duties of the other crew members, in case of an abnormal or an emergency condition.
Since it is not possible to cover all the situations which may occur, the captain will be responsible for adapting the following instructions, to obtain the best coordination of the emergency operation.
Should it be physically impossible for the captain to carry out his duties, another crewmember will substitute for him according to the chain of command.
The procedures in the manual are AIRBUS procedures and should be considered to be a reference.

COCKPIT-ASSIGNED DUTIES FOR EVACUATION

Ident.: PRO-ABN-90-00010101.0001001 / 03 NOV 21
Applicable to: ALL

■ If it is NOT POSSIBLE to reach the passenger cabin:

The flight crew should evacuate the aircraft via the cockpit clearview windows, by using the escape ropes.

On ground, each crewmember must help passengers, and direct them away from the aircraft.

■ If it is POSSIBLE to reach the passenger cabin:

CAPT	- Is the last person to leave the cockpit: Proceeds to the cabin and helps with passenger evacuation, as necessary - Is the last person to leave the aircraft: Checks that all persons have evacuated the aircraft - Evacuates the aircraft, via the rear door, or any other available exit, if the captain cannot reach the rear door - On ground, the captain takes command of operations until rescue units arrive.
F/O	- Proceeds to the cabin, and takes the emergency equipment - Evacuates the aircraft, using any available exit - Helps passengers on ground, and directs them away from the aircraft.

CABIN CREW-ASSIGNED AREAS FOR EVACUATION

Ident.: PRO-ABN-90-00010103.0001001 / 17 MAR 11
Applicable to: ALL

CABIN CREW DESIGNATION	ASSIGNED JUMPSEAT AND DOOR	ASSIGNED AREA
1 PURSER	DOOR 1 LH	FWD - ALL CABIN
1 CABIN CREW	DOOR 1 RH	FWD
2 CABIN CREWS	DOOR 2 RH/LH	MID/FWD
2 CABIN CREWS	DOOR 3 RH/LH	MID/AFT
2 CABIN CREWS	DOOR 4 RH/LH	AFT/MID

Note: These procedures are established for the minimum required number of 8 cabin crews.

COMMUNICATIONS

Ident.: PRO-ABN-90-00010104.0001001 / 27 FEB 18
Applicable to: ALL

1. EMERGENCY CALL

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- Press "EMER pb-sw" on the CALL panel, or - Passenger Address (PA) System: "PURSER TO COCKPIT PLEASE!"	The Purser must immediately go to the cockpit.
CABIN	COCKPIT	- Interphone: "PRIO CAPT"	Any cabin crewmember can make such a call. The cockpit crew must reply.

2. EMERGENCY ALERT

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "ATTENTION CREW! AT STATIONS!"	The cockpit crew makes a short and precise announcement to warn that an emergency evacuation may soon be required. Cabin crews must proceed to their emergency stations.

3. NOTIFICATION TO PASSENGERS

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- SIGNS ON - PA system	For psychological reasons, the cockpit crew should be the first to inform of an intended emergency landing.
PURSER	CABIN	- CABIN LIGHTS 100 % - PA System	Purser informs passengers that they have to pay special attention to these warnings: - "FINISH PREPARATION" - "BRACE FOR IMPACT" - "EVACUATE, EVACUATE"

4. FINISH PREPARATION

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- Passenger address (PA) System: "FINISH PREPARATION!"	The cockpit crew gives this order a short time before an emergency landing.

5. BRACE FOR IMPACT

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "BRACE FOR IMPACT!"	The cockpit crew announces to brace for impact approximately 1 min before landing.

6. INITIATE EVACUATION (RESTRICTED EXITS)

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "EVACUATE, EVACUATE" - Activate EVAC signals.	The cockpit crew orders an immediate evacuation, and the cabin crew directs passengers to all available exits.
CABIN	COCKPIT AND CABIN	- EVAC SIGNAL SYSTEM on FWD ATTND panel (FAP) - PA System or megaphone.	Used by the cabin crew, if there is no signal or order from the cockpit, and if it is unmistakably clear that the aircraft must be evacuated.
CABIN	CABIN	- Verbal	The cabin crew stands up and shouts: - "SEATBELTS OFF!" - "LEAVE EVERYTHING!" - "GET OUT!" - "COME THIS WAY!"

7. EVACUATION NOT REQUIRED

FROM	TO	COMMUNICATION METHOD(S)	REMARKS
COCKPIT	CABIN	- PA System: "CABIN CREW and PASSENGERS REMAIN SEATED!"	When the Captain decides that an evacuation is not required, the cockpit crew makes an immediate announcement to this effect.

ON GROUND EVACUATION

Applicable to: ALL

Ident.: PRO-ABN-90-A-00010105.0001001 / 16 JAN 18

COCKPIT CREW PROCEDURES

The cockpit crew notifies the cabin crew of the nature of the emergency, and states intentions.

The cockpit crew uses the Passenger Address system, to make an appropriate announcement, such as: “EVACUATE, EVACUATE”, and presses the EVAC COMMAND pb ◁ .

Ident.: PRO-ABN-90-A-00010106.0001001 / 26 JAN 18

CABIN CREW PROCEDURES

When the cabin receives the order to evacuate, each cabin crewmember must proceed as follows:

STAND UP AND SHOUT..........."UNFASTEN SEATBELTS"
OUTSIDE CONDITIONS...........CHECK

- **If outside conditions are safe:**

  DOOR IN ARMED POSITION...........OPEN FIRMLY
  SHOUT..........."COME THIS WAY"

  - **If the door does not open automatically:**

    DOOR...........PUSH AND OPEN MANUALLY

  SLIDE (or SLIDERAFT) DEPLOYMENT...........CHECK FULL DEPLOYMENT

  It takes approximately 4 s for the slide (or slideraft) to deploy.

  - **If the slide (or slideraft) does not automatically inflate:**

    RED, MANUAL INFLATION HANDLE...........PULL

    The red, manual inflation handle is located on the right-hand side of the slide (or slideraft) girt extension.

  ORDER..........."EVACUATE, EVACUATE"
  PASSENGER EVACUATION...........EXPEDITE

  - **If the slide (or slideraft) becomes unserviceable:**

    PASSENGER EVACUATION...........STOP
    PASSENGERS TO ANOTHER USABLE EXIT...........REDIRECT

  TOTAL ZONE EVACUATION...........CHECK
  CABIN CREW...........EVACUATE
  PASSENGERS AWAY FROM THE AIRCRAFT...........DIRECT

- **If outside conditions are unsafe:**

  EXIT DOOR...........BLOCK
  PASSENGERS TO NEAREST USABLE EXIT...........REDIRECT

COCKPIT EVACUATION THROUGH WINDOW

Applicable to: ALL

Ident.: PRO-ABN-90-B-00010107.0001001 / 05 AUG 10

OPENING THE SLIDING WINDOW

HANDLE....................PUSH DOWN AND PULL BACK

Pulling the handle backwards, opens the sliding window.

Ident.: PRO-ABN-90-B-00010108.0001001 / 24 NOV 15

COCKPIT EVACUATION WITH ESCAPE ROPE

ESCAPE ROPE STOWAGE....................OPEN

The escape rope stowage is located above the sliding window, on either side of the overhead panel.

ESCAPE ROPE....................UNROLL

Unroll the escape rope, and throw it through the window.

SEAT....................STEP ON

ESCAPE ROPE....................GRASP

Grasp the escape rope firmly with both hands, and slide down along the rope.

EVACUATION ON WATER

Applicable to: ALL

Ident.: PRO-ABN-90-C-00010109.0001001 / 17 MAR 11

CABIN CREW RESPONSIBLE FOR TYPE “A” DOORS

- **When the cabin receives the order to evacuate, each cabin crewmember must proceed as follows:**

  CHILDREN LIFEVESTS....................DISTRIBUTE

  STAND UP AND SHOUT....................
  ...."UNFASTEN SEATBELTS-PUT ON YOUR LIFEVEST"

  Inflate the lifevest, only once outside the aircraft.

  ORDER...................."REMOVE SHOES"

- **If the Type A door is usable:**

  DOOR IN ARMED POSITION....................OPEN

  SLIDERAFT....................DEPLOY

  RED, MANUAL INFLATION HANDLE....................PULL

  Do not wait for automatic inflation of the slideraft.

■ **If the water level is close to the door sill:**

The slideraft inflates on the water.

SLIDERAFT...LEAVE ATTACHED TO CABIN FLOOR
PASSENGER LIFEVESTS.....................................INFLATE WHEN BOARDING SLIDERAFT
PASSENGERS... BOARD SLIDERAFT
TOTAL ZONE EVACUATION...CHECK
LAST CREWMEMBER... BOARD SLIDERAFT
SLIDERAFT.. SEPARATE FROM DOOR SILL

The last crewmember must separate the slideraft from the door sill, and board with all the necessary safety equipment.

MOORING LINE...CUT
SURVIVAL KIT.. RETRIEVE

The survival kit is attached to the slideraft via a lanyard.

■ **If the water level is too far away from the door sill:**

SLIDERAFT...DISCONNECT FROM DOOR SILL

The slideraft remains tied to the aircraft by a 6 m (20 ft) mooring line.

MOORING LINE...HOLD

To keep the slideraft close to the exit, hold the mooring line.

PASSENGER LIFEVESTS.....................................INFLATE WHEN BOARDING SLIDERAFT
PASSENGERS... BOARD SLIDERAFT
TOTAL ZONE EVACUATION...CHECK
LAST CREWMEMBER... BOARD SLIDERAFT

The last crewmember must board with all the necessary safety equipment.

MOORING LINE...CUT
SURVIVAL KIT.. RETRIEVE

The survival kit is attached to the slideraft via a lanyard.

Ident.: PRO-ABN-90-C-00010110.0001001 / 05 AUG 10

CABIN CREW RESPONSIBLE FOR EMERGENCY EXIT TYPE "I" DOORS

● **When the cabin receives the order to evacuate, each cabin crewmember must proceed as follows:**

CHILDREN LIFEVESTS..DISTRIBUTE
STAND UP AND SHOUT..
...."UNFASTEN SEATBELTS — PUT ON YOUR LIFEVEST"
ORDER..."REMOVE SHOES"

Note: *Evacuation is usually done through the passenger doors. However, if one of the passenger doors is not usable, Exit 3 door (Type 1) may be used for evacuation, and the slide may be used as a flotation device.*

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NORMAL PROCEDURES

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FOREWORD

Ident.: PRO-NOR-SOP-01-00010854.0001001 / 05 DEC 17
Applicable to: ALL

The procedures contained in this Chapter are recommended by Airbus, and are consistent with the other Chapters of this manual.

The Authorities do not certificate Standard Operating Procedures. The manufacturer presents them herein as the best way to proceed, from a technical and operational standpoint. They are continually updated and the revisions take into account Operator input, as well as manufacturer experience.

In addition, Operators may amend them, as needed. However, the manufacturer recommends that Operators using the FCOM as onboard operational manual submit suggested changes to expedite publication, and maintain consistency of the manual. The Operator should note that they may rewrite this Chapter, at their own responsibility ; this could, however, make it difficult to update the manual and keep it consistent with the other Chapters.

The following sections contain expanded information on normal procedures.

Standard Operating Procedures consist of inspections, preparations, and normal procedures. All items of a given procedure are listed in a sequence that follows a standardized scan of the cockpit panels, unless that sequence goes against the action priority logic, to ensure that all actions are performed in the most efficient way.

These procedures assume that all systems are operating normally, and that all automatic functions are used normally.

Standard Operating Procedures consider that both pilots use Electronic Flight Bag (EFB). Airbus recommends operating with two EFBs in order to reduce the risk of erroneous inputs.

The FCOM also contains normal procedures that are non-routine procedures in the Supplementary Procedures chapter and in the Special Operations chapter.

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GPS PRIMARY AVAILABILITY (IF INSTALLED)

Ident.: PRO-NOR-SOP-02-00014828.0006001 / 06 NOV 23
Applicable to: ALL

- **For RNP1/RNP2/RNP4 operations, RNP APCH/RNAV(GNSS) approaches, and RNP AR/RNAV(RNP) ◁ approaches:**

  GPS PRIMARY availability is demonstrated to be available 100 % of the time with 24 healthy satellites.

  If required by operational regulation, for specific conditions (e.g. RNP AR/RNAV(RNP), mountainous terrain, or less than 24 satellites), an appropriate Ground-Based Prediction Program should be used to check the GPS PRIMARY availability for each intended procedure (arrival, departure, and alternate if required).

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SAFETY EXTERIOR INSPECTION

Applicable to: ALL

Ident.: PRO-NOR-SOP-03-A-00010458.0001001 / 09 NOV 21

GENERAL

Safety exterior inspections ensure that the aircraft and the external environment of the aircraft are safe for operation. When the flight crew arrives at the aircraft, they must check for, or be informed of any obstructions near the aircraft, engineering activity, or refueling activity, etc.

Ident.: PRO-NOR-SOP-03-A-00010461.0001001 / 05 MAY 22

WHEEL CHOCKS

WHEEL CHOCKS.. CHECK | CM2

L2 *If the wheel chocks are not in position, the flight crew must check that the parking brake is set with sufficient accumulator pressure.*

Ident.: PRO-NOR-SOP-03-A-00010462.0001001 / 05 MAY 22

LANDING GEAR DOORS

LANDING GEAR DOORS..CHECK POSITION | CM2

WARNING	*If any landing gear door is open, do not pressurize the hydraulic systems until clearance is obtained from ground personnel.*

Ident.: PRO-NOR-SOP-03-A-00010463.0001001 / 05 MAY 22

APU AREA

APU AREA.. CHECK | CM2

L2 *Observe that the APU inlet and outlet are clear.*

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GENERAL

Ident.: PRO-NOR-SOP-04-00010896.0001001 / 09 NOV 21
Applicable to: ALL

Items marked by asterisks (*) are the only steps to be completed after a transit stop without flight crew change. Otherwise, the new flight crew performs all the items.
The safety checks prevent the inadvertent operation of aircraft systems, danger to the aircraft, and danger to the personnel.

AIRCRAFT SETUP

Applicable to: ALL

Ident.: PRO-NOR-SOP-04-A-00021745.0001001 / 09 NOV 21

GENERAL

WARNING	Do not pressurize the hydraulic systems until clearance is obtained from ground personnel.

Ident.: PRO-NOR-SOP-04-A-00010897.0001001 / 09 NOV 21

ENG

ENG 1, 2 MASTERS LEVERS	OFF	CM2
ENG START selector	NORM	CM2

Ident.: PRO-NOR-SOP-04-A-00011881.0001001 / 09 NOV 21

WEATHER RADAR

* Radar sw	OFF	CM2
* WINDSHEAR/PWS sw	OFF	CM2
* GAIN knob	AUTO/CAL	CM2
* MODE selector	AS RQRD	CM2

Ident.: PRO-NOR-SOP-04-A-00010898.0001001 / 09 NOV 21

L/G

L/G lever	DOWN	CM2

Ident.: PRO-NOR-SOP-04-A-00010899.0001001 / 09 NOV 21

WIPERS

Both WIPER selectors	OFF	CM2

BATTERIES CHECK/EXTERNAL POWER

Ident.: PRO-NOR-SOP-04-00010900.0002001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP
Impacted by TDU: 00014152 Batteries Check/Setup

- **If the aircraft has not been electrically supplied for 6 h or more, perform the following check:**

  BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw................................CHECK OFF | CM2
  BAT 1 and 2 and APU BAT VOLTAGE...............................CHECK ABOVE 25.5 V | CM2

  L2 *Battery voltage above 25.5 V ensures a charge above 50 %. After the check, the selector should remain on the APU position to avoid discharge of BAT 1 or 2.*

  L1
  - **If the battery voltage is at or below 25.5 V:**

    a charging cycle of about 20 min is required.

    BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................................AUTO | CM2
    EXT PWR..ON | CM2

    L2 *Check on ELEC DC SD page, battery contactors closed and batteries charging.*

    L1
    - **after 20 min:**

      BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw................................OFF | CM2
      BAT 1 and 2 and APU BAT VOLTAGE...................CHECK ABOVE 25.5 V | CM2

      L2 *After the check, the selector should remain on the APU position.*

  L1
  - **If the battery voltage is above 25.5 V:**

    BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................................AUTO | CM2

    Note: If the aircraft is supplied by batteries only: After 5 min the ground horn will trigger, and the ventilation EXTRACT FAULT light will come on, along with the ECAM warning.

- **If the aircraft has been electrically supplied during the last 6 h:**

  BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw.. AUTO | CM2

L12

Note: In case of APU start on battery only, perform the following check:

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw.............................AUTO | CM2
BAT 1 and 2 and APU BAT..................................CHECK ABOVE 23.5 V | CM2

If one battery voltage is lower than 23.5 V, there is a risk that APU start aborts. A charging cycle of the battery is required.

- **If the AVAIL light is on:**

  EXT PWR pb....................ON | CM2

  Note: 1. If only one electrical power is available, the ground personnel should connect EXT PWR A since:
  - *EXT PWR B does not permit to supply directly GND/FLT buses without energizing the total aircraft network.*
  - *The simultaneous use of EXT PWR B and APU GEN is not possible.*

  2. If AVAIL does not come on (EXT PWR connected) or ON/AVAIL go out during EXT PWR operation, the GPCU protection trips. Use the EXT PWR to reset.

BATTERIES CHECK/EXTERNAL POWER

Ident.: PRO-NOR-SOP-04-00010900.0002001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

■ **If the aircraft has not been electrically supplied for 6 h or more, perform the following check:**

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................CHECK OFF | CM2
BAT 1 and 2 and APU BAT VOLTAGE....................CHECK ABOVE 25.5 V | CM2

L2 *Battery voltage above 25.5 V ensures a charge above 50 %. After the check, the selector should remain on the APU position to avoid discharge of BAT 1 or 2.*

L1 ■ **If the battery voltage is at or below 25.5 V:**

a charging cycle of about 20 min is required.

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................AUTO | CM2
EXT PWR....................ON | CM2

L2 *Check on ELEC DC SD page, battery contactors closed and batteries charging.*

L1 ● **after 20 min:**

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................OFF | CM2
BAT 1 and 2 and APU BAT VOLTAGE....................CHECK ABOVE 25.5 V | CM2

L2 *After the check, the selector should remain on the APU position.*

L1 ■ **If the battery voltage is above 25.5 V:**

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................AUTO | CM2

Note: If the aircraft is supplied by batteries only: After 5 min the ground horn will trigger, and the ventilation EXTRACT FAULT light will come on, along with the ECAM warning.

■ **If the aircraft has been electrically supplied during the last 6 h:**

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................AUTO | CM2

L12

Note: *In case of APU start on battery only, perform the following check:*

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw..............................AUTO | CM2
BAT 1 and 2 and APU BAT...................................CHECK ABOVE 23.5 V | CM2

If one battery voltage is lower than 23.5 V, there is a risk that APU start aborts. A charging cycle of the battery is required.

- **If the AVAIL light is on:**

  EXT PWR pb..ON | CM2

  Note: *1. If only one electrical power is available, the ground personnel should connect EXT PWR A since:*
  - *EXT PWR B does not permit to supply directly GND/FLT buses without energizing the total aircraft network.*
  - *The simultaneous use of EXT PWR B and APU GEN is not possible.*

  2. If AVAIL does not come on (EXT PWR connected) or ON/AVAIL go out during EXT PWR operation, the GPCU protection trips. Use the EXT PWR to reset.

BATTERIES CHECK/EXTERNAL POWER

Ident.: TDU / PRO-NOR-SOP-04-00014152.0001001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP
Impacted DU: 00010900 Batteries Check/Setup

■ **If the aircraft has not been electrically supplied for 6 h or more, perform the following check:**

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw.................................CHECK OFF | CM2
BAT 1 and 2 and APU BAT VOLTAGE.................................CHECK ABOVE 25.5 V | CM2

L2 *Battery voltage above 25.5 V ensures a charge above 50 %. After the check, the selector should remain on APU position to avoid discharge of BAT 1 or 2.*

L1 ■ **If the battery voltage is at or below 25.5 V:**

a charging cycle of about 20 min is required.

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................................AUTO | CM2
EXT PWR..ON | CM2

Check on ELEC DC SD page, battery contactors closed and batteries charging.

- **after 20 min:**

  BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw.................................OFF | CM2
  BAT 1 and 2 and APU BAT VOLTAGE....................CHECK ABOVE 25.5 V | CM2

L2 *After the check, the selector should remain on the APU position.*

L1

- **If the battery voltage is above 25.5 V:**

  BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................................AUTO | CM2

  Note: *If the aircraft is supplied by batteries only: After 5 min, the ground horn will trigger, and the ventilation EXTRACT FAULT light will come on, along with the ECAM warning.*

  Note: *When the aircraft is supplied by batteries only, one safety valve is detected open and the SAFETY VALVE OPEN caution is triggered. This alert can be disregarded, and cockpit preparation be continued.*

- **If the aircraft has been electrically supplied during the last 6 h:**

  BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw...AUTO | CM2

L12

Note: *In case of APU start on battery only, perform the following check:*

BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw..............................AUTO | CM2
BAT 1 and 2 and APU BAT..................................CHECK ABOVE 23.5 V | CM2

If one battery voltage is lower than 23.5 V, there is a risk that APU start aborts.
A charging cycle of the battery is required.

Note: *When the aircraft is supplied by batteries only, one safety valve is detected open and the SAFETY VALVE OPEN caution is triggered. This alert can be disregarded, and cockpit preparation be continued.*

● **If the AVAIL light is on:**

EXT PWR pb...ON | CM2

Note: *1. If only one electrical power is available, the ground personnel should connect EXT PWR A since:*
- EXT PWR B does not permit to supply directly GND/FLT buses without energizing the total aircraft network.
- The simultaneous use of EXT PWR B and APU GEN is not possible.
2. If AVAIL does not come on (EXT PWR connected) or ON/AVAIL go out during EXT PWR operation, the GPCU protection trips. Use the EXT PWR to reset.

APU FIRE TEST/APU START

Applicable to: ALL

Ident.: PRO-NOR-SOP-04-C-00025222.0001001 / 06 MAY 22

RMP

RMP ....CHECK ON/SET | CM2
Green NAV light..CHECK OFF | CM2

SEL light	CHECK OFF	CM2
COM FREQUENCIES	TUNE	CM2

L2 *Use VHF 1 for ATC (only VHF 1 is available in emergency electrical configuration), VHF 2 for ATIS and company frequencies. VHF 3 is normally devoted to ACARS.*

Ident.: PRO-NOR-SOP-04-C-00026554.0001001 / 28 NOV 23

ACP

INT knob.................. PRESS OUT/VOLUME CHECK | PF

L2 *Ensure that INT volume is turned up, to enable contact with the ground crew.*

L1 VHF..................CHECK | PF

L2 *Check transmission and reception.*

L1 HF (if required for flight)..................CHECK | PF

L2 *Check transmission and reception.*

CAUTION	
	- *Do not transmit on HF during refueling operations (i.e. refueling, defueling, fuel transfer)* - *Only perform HF radio checks when appropriate (i.e. no personnel in the immediate vicinity).*

Ident.: PRO-NOR-SOP-04-C-00010902.0001001 / 09 NOV 21

APU FIRE

APU FIRE pb-sw	CHECK IN and GUARDED	CM2
APU AGENT light	CHECK OFF	CM2
APU FIRE TEST pb	PRESS and MAINTAIN	CM2

TEST RESULT

Check that the APU fire detection and extinguishing system is operative:
- APU FIRE warning on (if AC power available):
  - ECAM
  - CRC
  - MASTER WARN light.
- APU FIRE pb-sw lighted red (lighted partially if AC power not available)
- SQUIB light and DISCH light on.

Ident.: PRO-NOR-SOP-04-C-00010903.0002001 / 24 NOV 23

APU START

APU MASTER SW pb-sw ....ON | CM2

● **If batteries only are supplying:**
APU pb (on the ECAM control panel)..PRESS | CM2

L2 *This action enables the display of the APU SD page on the upper ECAM.*

L1 APU START pb-sw ....ON | CM2

L2 *To increase the APU START performance, Airbus recommends to set the APU START pb-sw to ON 3 min after the flight crew sets the APU MASTER SW pb-sw to ON. This ensures the APU fuel feed line is sufficiently pressurized.*
For more information on the APU start, Refer to APU Controls and indicators/Overhead panel.

L1 *Note: In cold weather conditions (below approximately 10 °C), the flight crew may observe a bleed pressure up to 12 PSI with possible fluctuations on the APU SD page and the BLEED SD page.*

L2 *For more information on APU starter limitations and APU operations during refueling:*
- *Refer to LIM-APU APU Start*
- *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling.*

L1 ● **When the APU is AVAIL:**
APU BLEED pb-sw ....ON | CM2

L2 *Do not use APU BLEED, if the ground personnel confirms that a LP or HP ground air unit is connected to the aircraft.*
To determine if a HP ground air unit is connected, the flight crew should also check on the BLEED SD page, if there is pressure in the bleed air system.

L1 ALL WHITE lights..OFF | CM2
X-BLEED rotary selector ....AUTO | CM2
COCKPIT TEMP rotary selector and CABIN TEMP rotary selector ....AS RQRD | CM2

L2 *Full range temperature 24 ± 6 °C (75 ± 11 °F).*
The temperature selection recommended for the cabin is 21.5 °C (about 10 o'clock).

L1 * EXT PWR pb .... AS RQRD | CM2

L2 *The flight crew should keep the external power units ON to reduce the APU load, particularly in hot weather conditions.*

ADIRS

Ident.: PRO-NOR-SOP-04-00011860.0004001 / 03 NOV 22
Applicable to: ALL

ADIRS

* ALL IR MODE selector .... NAV | CM2

L2 *Align or realign IRS as appropriate. Refer to FCTM/PR-NP-SOP-40 ADIRS Operations.*

A complete IRS alignment must be performed in the following cases:

- Before the first flight of the day, or
- When there is a crew change, or
- When the departure airport is located between latitudes 2 ° north and 2 ° south, or
- When the GPS is not available and the NAVAID coverage is poor on the expected route, or
- When the GPS is not available and the expected flight time is more than 3 h.

A fast IRS alignment must be performed if a complete IRS alignment is not necessary.
To perform an alignment, the aircraft must be stopped on ground. Do not align IRS during engine start, or while the engines are running. In the case of aircraft movement during the IRS alignment, the flight crew must perform a new full alignment.

COCKPIT LIGHTS

Ident.: PRO-NOR-SOP-04-00010908.0001001 / 09 NOV 21
Applicable to: ALL

COCKPIT LIGHTS

* COCKPIT LIGHTS.. AS RQRD |CM1-CM2

L2 *Set INT LT, FLOOD LT, INTEG LT (included glareshield and FCU).*

EFB/ACARS (IF INSTALLED) INITIALIZATION

Applicable to: ALL

Ident.: PRO-NOR-SOP-04-B-00021766.0001001 / 09 NOV 21

EFB START

ALL EFB...START |CM1-CM2

- **In accordance with the Operator's policy or if required by operational regulation:**

  EFB/eQRH VERSION...CHECK |CM1-CM2

  If required, the flight crew performs this check unless a specific procedure is established as per Operator's policy to ensure that the correct version is onboard.

  On the EFB STATUS page and the eQRH My aircraft page, check the EFB VERSION number and compare it with the valid version number given as reference by the Operator (e.g. on the company flight plan).

Ident.: PRO-NOR-SOP-04-B-00026029.0001001 / 28 NOV 23

ACARS ◁ INITIALIZATION

* ACARS ◁ .... INITIALIZE | CM1

L2 *Initialize ACARS if not done automatically, as per company policy.*

Ident.: PRO-NOR-SOP-04-B-00021756.0001001 / 04 DEC 18

FMGS PRE-INITIALIZATION

Perform FMGS Pre-Initialization in the case of ACARS ◁ operations or EFB operations with SYNCHRO AVIONICS ◁ .

At electrical power-up, the FMGSs and FCU run through various internal tests. Allow enough time (3 min) for tests' completion, and do not start to press pushbuttons until the tests are over. If the "PLEASE WAIT" message appears, do not press any MCDU key until the message clears.

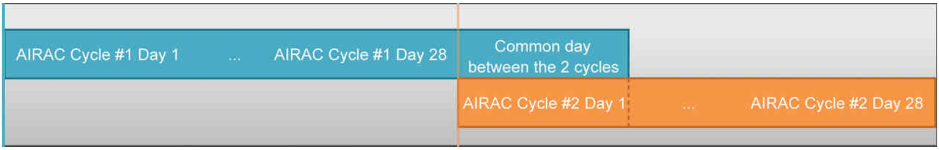
Ident.: PRO-NOR-SOP-04-B-00021754.0001001 / 09 NOV 21

* ENGINE & AIRCRAFT TYPE.. CHECK | CM1

Ident.: PRO-NOR-SOP-04-B-00021788.0001001 / 09 NOV 21

* FM database validity.. CHECK | CM1

- *Check the DATA BASE validity and stored WPT/NAVAIDS/RWY/ROUTES, if any. If applicable, review the stored data for deletion decision.*
- *On Honeywell FMS, the double AIRAC cycle of the NDB has one day in common (AIRAC Cycle #1 Day 29 / AIRAC Cycle #2 Day 1). From Day 2 of AIRAC Cycle #2, the active database is no longer valid and the message "CHECK DATA BASE CYCLE" will be triggered.*
  On the common day, select AIRAC Cycle #2 prior to the first flight of the day.



Ident.: PRO-NOR-SOP-04-B-00021706.0001001 / 09 NOV 21

* FLT NBR.. INSERT/CHECK | CM1

L2 *Insert FLT NBR only if the company flight plan is not received via ACARS.*

L1 * FROM/TO.. INSERT/CHECK | CM1

L2 *Insert FROM/TO only if the company flight plan is not received via ACARS.*

Ident.: PRO-NOR-SOP-04-B-00021767.0001001 / 09 NOV 21

EFB STATUS PAGE

* EFB SYNCHRO AVIONICS ◁ .... CLICK | CM1-CM2
* EFB STATUS page.. INSERT/CHECK | CM1-CM2

L2 On the EFB STATUS page, each flight crewmember checks or, inserts and checks (if no EFB SYNCHRO AVIONICS):
- ACFT TYPE and ACFT REG
- FLT NBR and FROM/TO (in agreement with the FMS ACTIVE/INIT page).

AIRCRAFT ACCEPTANCE

Ident.: PRO-NOR-SOP-04-00021759.0002001 / 24 NOV 23
Applicable to: LV-KHT, LV-KHU

* RCL pb......................................PRESS 3 s | CM1

L2 *This action recalls all the warnings that the flight crew cleared or cancelled during the last flight.*

L1 * LOGBOOK AND MEL/CDL ITEMS......................CHECK | BOTH

L2
- *Check the deferred items list*
- *Crosscheck with ECAM recall.*

All flight crewmembers:
- *Check and discuss the technical condition of the aircraft (deferred items list)*
- *Check and discuss the MEL items (including the associated operational procedures, if any) and the CDL items. This includes the acceptability of the MEL and CDL items and the influence on the flight plan*
- *Activate the MEL and CDL items (the activated MEL and CDL items are sent to the performance applications)*
- *In icing conditions with OAT below +1 °C (34 °F) check the taxi-in time in freezing fog of the previous flight recorded in the logbook. This time will be used to determine the remaining taxi-out time before the next engine acceleration for ice shedding (Refer to PRO-NOR-SUP-ADVWXR Engine Ice Shedding on Ground).*

L1 AIRCRAFT CONFIGURATION SUMMARY......................CHECK | BOTH

L2 *For awareness of the current aircraft configuration, both flight crewmembers discuss together the optional installed aircraft systems and functions, and their influence on the ongoing flight.*

L1 * OEB......................................CHECK | BOTH

L2 *All flight crewmembers review and discuss together all OEBs and associated procedures applicable to the aircraft.*
Any flight crewmember who operates at the flight deck at any time during the on-going flight should be aware of the applicable OEB(s).

L1 * AIRCRAFT ACCEPTANCE......................PERFORM | CM1

Note: *The aircraft acceptance can be performed later, but must be completed at the end of the Cockpit Preparation.*

AIRCRAFT ACCEPTANCE

Ident.: PRO-NOR-SOP-04-00021759.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

* RCL pb..........PRESS 3 s | CM1

L2 *This action recalls all the warnings that the flight crew cleared or cancelled during the last flight.*

L1 * LOGBOOK AND MEL/CDL ITEMS..........CHECK | BOTH

L2
- *Check the deferred items list*
- *Crosscheck with ECAM recall.*

All flight crewmembers:
- *Check and discuss the technical condition of the aircraft (deferred items list)*
- *Check and discuss the MEL items (including the associated operational procedures, if any) and the CDL items. This includes the acceptability of the MEL and CDL items and the influence on the flight plan*
- *Activate the MEL and CDL items (the activated MEL and CDL items are sent to the performance applications)*
- *In icing conditions with OAT at +3 °C (37 °F) or below, check the taxi-in time of the previous flight in icing conditions with OAT at +3 °C (37 °F) or below recorded in the logbook. This time will be used to determine the remaining taxi-out time before the next engine acceleration for ice shedding (Refer to PRO-NOR-SUP-ADVWXR Engine Operations on Ground in Icing Conditions).*

L1 AIRCRAFT CONFIGURATION SUMMARY..........CHECK | BOTH

L2 *For awareness of the current aircraft configuration, both flight crewmembers discuss together the optional installed aircraft systems and functions, and their influence on the ongoing flight.*

L1 * OEB..........CHECK | BOTH

L2 *All flight crewmembers review and discuss together all OEBs and associated procedures applicable to the aircraft.*
Any flight crewmember who operates at the flight deck at any time during the on-going flight should be aware of the applicable OEB(s).

L1 * AIRCRAFT ACCEPTANCE..........PERFORM | CM1

Note: *The aircraft acceptance can be performed later, but must be completed at the end of the Cockpit Preparation.*

PRELIMINARY PERFORMANCE DETERMINATION

Ident.: PRO-NOR-SOP-04-00021760.0001001 / 24 NOV 23
Applicable to: ALL

For more information, *Refer to FCTM/PR-NP-SOP-PRELIMINARY COCKPIT PREPARATION-Preliminary Takeoff Performance Computation*.

Each flight crewmember independently computes the preliminary performance data in accordance with the technical condition of the aircraft and/or any other criteria that may affect the aircraft performance (e.g. NOTAM, runway condition, aircraft configuration).

* AIRFIELD DATA....................................OBTAIN | CM1-CM2

L2 *Obtain data needed for initializing the system, preparing the cockpit and for preliminary takeoff performance computation. The airfield data should include: RUNWAY IN USE, ALTIMETER SETTING, and WEATHER DATA.*

L1
- **If the LOADSHEET application is used:**
  * PRELIMINARY LOADING....................COMPUTE AND CROSSCHECK | CM1-CM2
- **If dispatch under MEL and in accordance with the logbook:**
  * MEL/CDL ITEMS (as appropriate)....................CHECK ACTIVATED | CM1-CM2

L2 *As appropriate, check that the MEL and CDL items are activated in the applicable performance application.*

L1 * NAV CHARTS CLIPBOARD....................................PREPARE | BOTH

L2 *Prepare the necessary charts and verify that both flight crewmembers refer to the same chart reference.*

L1 * PRELIMINARY TAKEOFF PERF DATA....................................COMPUTE | CM1-CM2

L2 *Both flight crewmembers discuss together and decide all of the following:*
- *RWY to be used*
- *RWY intersection*
- *Flaps setting*
- *Use of anti-ice*
- *Use of packs*
- *Takeoff thrust setting options (FLEX, TOGA, DERATE).*

The PF and the PM independently compute the preliminary takeoff performance data.

L1 * PRELIMINARY TAKEOFF PERF DATA....................................CROSSCHECK | BOTH

L2 *The PF and the PM compare and ensure that the computations are the same.*

BEFORE WALKAROUND

Applicable to: ALL

Ident.: PRO-NOR-SOP-04-D-00021790.0002001 / 09 NOV 21

ECAM PAGES

- **On the DOOR SD page:**
  * OXY....................................CHECK PRESSURE | PM

- **If the OXY pressure is half boxed in amber:**

MIN FLT CREW OXY CHART....................................CHECK PRESSURE | PM

L2 *Verify that the pressure is sufficient for the scheduled flight (Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure).*

L1
- **On the HYD SD page:**

* RESERVOIR FLUID LEVEL......................CHECK WITHIN NORMAL RANGE | PM

- **On the ENG SD page:**

* ENG OIL QUANTITY..CHECK | PM

L2 *Check that the oil quantity is above the minimum. Refer to LIM-ENG Oil.*

L1 *Note:* *If the ENG oil quantity indication does not appear on the ENG SD page, press the ENG 1 and 2 FADEC GND PWR pb-sw on the overhead maintenance panel. After the check of the ENG oil quantity, press again the ENG 1 and 2 FADEC GND PWR pb-sw.*

Ident.: PRO-NOR-SOP-04-D-00010909.0001001 / 09 NOV 21

F/CTL

FLAPS..CHECK POSITION | PM

L2 *Check the upper ECAM display to confirm that the FLAPS position agrees with the handle position.*

L1 * SPEED BRAKE lever................................CHECK RETRACTED and DISARMED | PM

WARNING	*If flight control surface positions do not agree with the control handle positions, check with the maintenance crew before applying hydraulic power.*

Ident.: PRO-NOR-SOP-04-D-00010910.0001001 / 06 MAY 22

PARKING BRAKE

* ACCU PRESS indicator..CHECK | PM

L2 *The ACCU PRESS indication must be in the green band. If required use the electric pump on blue hydraulic system to recharge the brake accumulator.*

L1 * PARK BRK handle..ON | PM

L2 *When one brake temperature is above 500 °C (or above 350 °C with the brake fans ◁ ON), avoid applying the parking brake, unless operationally necessary.*

L1 * BRAKES PRESS indicator..CHECK | PM

L2 *Check for normal indications.*

L1 **WARNING** The blue electric pump pressurizes the blue hydraulic system. Get ground crew clearance before to use the electric pump.

Ident.: PRO-NOR-SOP-04-D-00010911.0001001 / 03 NOV 22

ALTERNATE BRAKING SYSTEM

The purpose of this check is to verify, before the first flight of the day, the efficiency of the alternate braking system (absence of “spongy pedals”).

CHOCKS.. CHECK IN PLACE | PM
PARK BRK handle.. OFF | PM

L2 *The ACCU PRESS indication must be in the green band. If required use the electrical pump on the blue hydraulic system to recharge the brake accumulator.*

L1 BRAKE PEDALS... PRESS | PM

L2 *Apply maximum pressure on both pedals.*

L1 BRAKE PRESSURE... CHECK | PM

L2 *Check on BRAKE PRESS indicator:*
- *The pressure builds up without delay symmetrically on left and right sides for the same application simultaneously applied on left and right pedals.*
- *With full pedal deflection, the pressure is between 2 200 PSI and 2 700 PSI.*

L1 BRAKE PEDALS... RELEASE | PM
PARK BRK handle... ON | PM

Ident.: PRO-NOR-SOP-04-D-00010919.0001001 / 18 NOV 21

EMERGENCY EQUIPMENT

EMER EQPT.. CHECK | PM

L2 *Check that:*
- *Life vests are stowed*
- *Crash axe is stowed*
- *Smoke hoods* ◁ *and/or portable oxygen equipment and full-face masks* ◁ *is stowed and ready for use*
- *Portable fire extinguisher is lockwired and the pressure gauge indicator is in the green area*
- *Oxygen masks are stowed*
- *Flashlights are stowed*
- *Escape ropes are stowed.*

Ident.: PRO-NOR-SOP-04-D-00010920.0001001 / 09 NOV 21

RAIN REPELLENT ⊲

RAIN RPLNT indicators.................................... CHECK PRESSURE and QUANTITY | PM

CAUTION	*Never use rain repellent to wash the windshield and never use it on a dry windshield.*

Ident.: PRO-NOR-SOP-04-D-00010921.0002001 / 24 NOV 23

LANDING GEAR PINS

* GEAR PINS.. CHECK ONBOARD and STOWED | PM

L2 *Check that the three gear pins are onboard and stowed.*

Intentionally left blank

GENERAL

Ident.: PRO-NOR-SOP-05-00011095.0001001 / 05 MAY 22
Applicable to: ALL

The exterior walkaround ensures that the general condition of the aircraft is satisfactory and that the visible aircraft components and equipment are safe for the flight:

- There is no impact damage to the structure
- There is no evident fuel, oil, or hydraulic leak
- All ground access doors are closed
- All covers are removed (e.g. pitot covers, AOA covers, etc.).

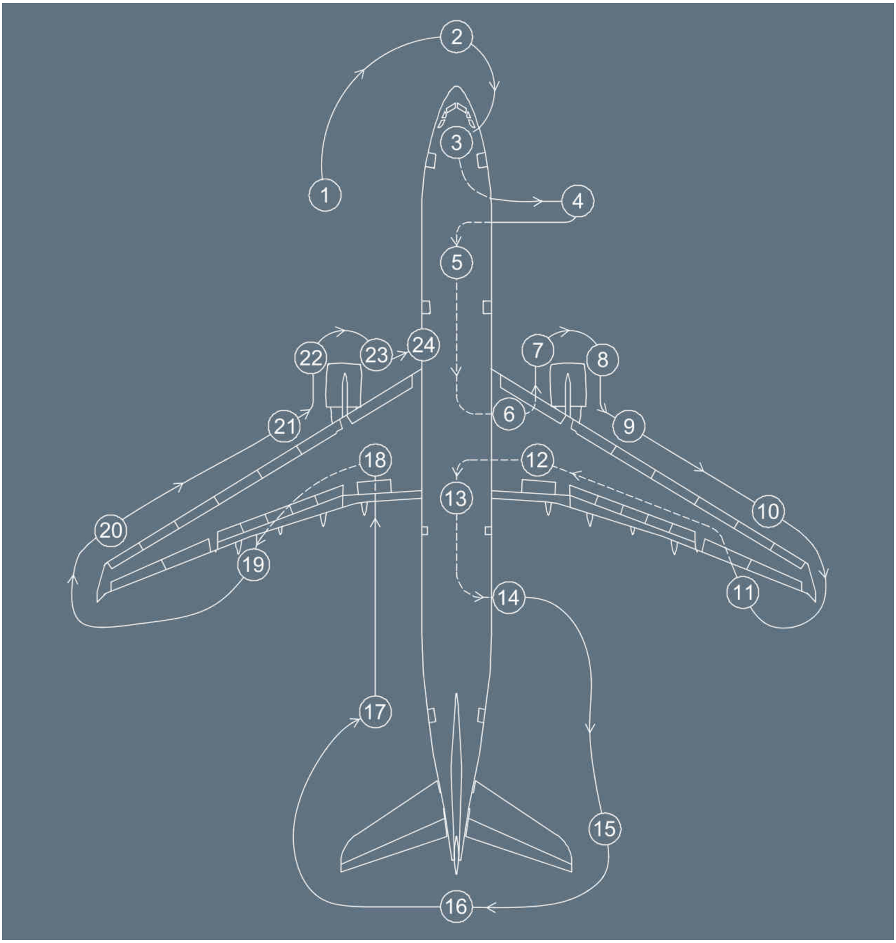
The flight crew must perform a complete walkaround before each flight.
The parking brake must be set to ON during the exterior walkaround, in order to enable the flight crew to check brake wear indicators.

WARNING	If any landing gear door is open, do not apply hydraulic power until clearance is obtained from ground personnel.

EXTERIOR WALKAROUND

Ident.: PRO-NOR-SOP-05-A-00011096.0001001 / 09 OCT 12
Applicable to: ALL

SCHEMATIC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(1) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH FWD Fuselage*

(2) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - Nose Section*

(3) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - Nose L/G*

(4) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH FWD Fuselage*

(5) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - Lower Center Fuselage*

(6) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Center Wing*

(7) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 2 LH Side*

(8) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 2 RH Side*

(9) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Wing Leading Edge*

(10) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Wing Tip*

(11) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Wing Trailing Edge*

(12) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH Landing Gear*

(13) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - Center Fuselage*

(14) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - RH AFT Fuselage*

(15) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - Tail*

(16) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - APU*

(17) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH AFT Fuselage*

(18) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Landing Gear and Fuselage*

(19) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Wing Trailing Edge*

(20) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Wing Tip*

(21) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Wing Leading Edge*

(22) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 1 LH Side*

(23) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - ENG 1 RH Side*

(24) *Refer to PRO-NOR-SOP-05 Exterior Walkaround - LH Center Wing*

Ident.: PRO-NOR-SOP-05-A-00011097.0001001 / 09 NOV 21
Applicable to: ALL

LH FWD FUSELAGE

Outflow valve........................CHECK CONDITION
Static ports........................CLEAR
AOA probe........................CHECK CONDITION

Wing and engine scan lights.....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011098.0001001 / 09 NOV 21
Applicable to: ALL

NOSE SECTION

Pitot probes.....CHECK CONDITION
TAT probes.....CHECK CONDITION
Radome and latches.....CHECK CONDITION/LATCHED
Avionics compartment door.....CLOSED
Ice detection probes.....CHECK CONDITION
Crew oxygen discharge indicator.....GREEN

Ident.: PRO-NOR-SOP-05-A-00011099.0001001 / 09 NOV 21
Applicable to: ALL

NOSE L/G

Nose wheel chocks.....IN PLACE
Wheels and tires.....CHECK CONDITION
Nose gear structure.....CHECK CONDITION
Taxi, Takeoff and Runway Turnoff lights.....CHECK CONDITION
Hydraulic lines and electrical wires.....CHECK CONDITION
Wheel well.....CHECK
Safety pin.....REMOVED
Ground electrical power door (if not required).....CLOSED
Avionic ventilation overboard valve.....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011100.0001001 / 09 NOV 21
Applicable to: ALL

RH FWD FUSELAGE

AOA probes.....CHECK CONDITION
PAX oxygen discharge indicator ◁ .....GREEN
Cargo loading operation access door (if not required).....CLOSED
Cargo door operation access door (if not required).....CLOSED
Cargo door (if not required).....CLOSED
Static ports .....CLEAR
Antennas.....CHECK CONDITION
Drain mast.....CHECK CONDITION
Wing and engine scan lights.....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011101.0001001 / 09 NOV 21
Applicable to: ALL

LOWER CENTER FUSELAGE

Emergency ram air inlet flap	CHECK CONDITION
LP ground connection door	CLOSED
Anticollision light	CHECK CONDITION
Pack air intakes and outlets	CLEAR
HP ground connection door	CLOSED
Ground hydraulic connection blue	CLOSED
Left L/G ground opening handle access door	CLOSED
Right L/G ground opening handle access door	CLOSED
Ground hydraulic connection yellow	CLOSED

Ident.: PRO-NOR-SOP-05-A-00011102.0001001 / 09 NOV 21
Applicable to: ALL

RH CENTER WING

Tank magnetic fuel level(s)	FLUSH
Fuel water drain valves	NO LEAK
Water drain valve door	CLOSED
Landing light	CHECK CONDITION
Slat 1	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011103.0006001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

ENG 2 LH SIDE

IDG oil fill access door	CLOSED
Thrust reversers cowl door	CLOSED
Pressure relief doors	CLOSED
Fan cowl doors	CLOSED/LATCHED/FLAG REMOVED
Drain masts	CHECK CONDITION/NO LEAK
Access to starter valve manual override	CLOSED
Access door to reversers latches	CLOSED
Engine inlet and fan blades	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011103.0002001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO

ENG 2 LH SIDE

IDG oil fill access door	CLOSED
Thrust reversers cowl door	CLOSED

Pressure relief doors	CLOSED
Fan cowl door	CLOSED/LATCHED
Drain masts	CHECK CONDITION/NO LEAK
Access to starter valve manual override	CLOSED
Access door to reversers latches	CLOSED
Engine inlet and fan blades	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011103.0004001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

ENG 2 LH SIDE

Thrust reversers pivot doors	CLOSED
Door position sensor harness access	CLOSED
Door pivot and position sensor access	CLOSED
IDG oil fill access door	CLOSED
Pressure relief and start valve/anti ice valve/reverser GND safety access	CLOSED
Drain masts	CHECK CONDITION/NO LEAK
Thrust reversers cowl doors	CLOSED/LATCHED
Fan cowl doors	CLOSED/LATCHED
Engine inlet and fan blades	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011104.0006001 / 13 DEC 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

ENG 2 RH SIDE

Engine oil fill access door	CLOSED
Fan cowl doors	CLOSED/LATCHED/ FLAG REMOVED
Thrust reverser cowl door	CLOSED
Pressure relief door	CLOSED
Turbine exhaust	CLEAR

Ident.: PRO-NOR-SOP-05-A-00011104.0002001 / 17 MAY 17
Applicable to: LV-KAN, LV-KAO

ENG 2 RH SIDE

Engine oil fill access door	CLOSED
Fan cowl door	CLOSED/LATCHED
Thrust reverser cowl door	CLOSED
Pressure relief door	CLOSED
Turbine exhaust	CLEAR

Ident.: PRO-NOR-SOP-05-A-00011104.0004001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

ENG 2 RH SIDE

Engine oil filler access door....CLOSED
Thrust reversers cowl doors....CLOSED/LATCHED
Fan cowl doors....CLOSED/LATCHED
Master chip detector and HYD case drain filter access....CLOSED
Drain masts....CHECK CONDITION/NO LEAK
Thrust reversers pivot doors....CLOSED
Door position sensor harness access....CLOSED
Door pivot and position sensor access....CLOSED
Turbine exhaust....CLEAR

Ident.: PRO-NOR-SOP-05-A-00011107.0001001 / 09 NOV 21
Applicable to: ALL

RH WING LEADING EDGE

Refuel coupling door....CLOSED
Inner and outer magnetic fuel levels....FLUSH
Fuel water drain valve....NO LEAK
RAT doors....CLOSED
Slats 2, 3, 4....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011110.0002001 / 09 NOV 21
Applicable to: ALL

RH WING TIP

Fuel ventilation overpressure disc ....INTACT
Wing fence....CHECK CONDITION
Magnetic fuel level(s)....FLUSH
Fuel water drain valve....NO LEAK
Surge tank air inlet....CLEAR
Slats 5, 6, 7....CHECK CONDITION
Navigation and Strobe lights....CHECK CONDITION
Antennas on top of fuselage....CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011111.0001001 / 09 NOV 21
Applicable to: ALL

RH WING TRAILING EDGE

Static dischargers....CHECK CONDITION
Control surfaces....CHECK CONDITION

Flaps and fairings........................CHECK CONDITION
Jettison outlet ◁✱ ....NO LEAK
Antennas on top of fuselage........................CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011112.0002001 / 09 NOV 21
Applicable to: ALL

RH LANDING GEAR

Chocks........................REMOVED
Wheels and tires........................CHECK CONDITION
Brakes and brake wear indicators........................CHECK CONDITION
Hydraulic lines........................CHECK
Landing gear structure........................CHECK
Downlock springs........................CHECK
Safety pin........................REMOVED

Ident.: PRO-NOR-SOP-05-A-00011114.0001001 / 09 NOV 21
Applicable to: ALL

CENTER FUSELAGE

Refuel electric control panel........................CLOSED
APU FUEL Drain........................CHECK CONDITION/NO LEAK
Ground hydraulic connection green and reservoir filling........................CLOSED

Ident.: PRO-NOR-SOP-05-A-00011115.0002001 / 24 NOV 23
Applicable to: ALL

RH AFT FUSELAGE

VHF 2 and RA Antennas........................CHECK CONDITION

Check that the RA antennas are clean.

Drain mast........................CHECK CONDITION
Potable water aft drain panel........................CLOSED
Cargo loading operation access door (if not required)........................CLOSED
Cargo door operation access door (if not required)........................CLOSED
Cargo door (if not required)........................CLOSED
Bulk door (if not required)........................CLOSED
Potable water service panel........................CLOSED
Waste service panel........................CLOSED

Ident.: PRO-NOR-SOP-05-A-00011116.0002001 / 06 MAY 22
Applicable to: ALL

TAIL

Stabilizer, elevator, fin and rudder	CHECK CONDITION
Surge tank air inlet	CLEAR
Fuel water drain valves (3)	NO LEAK
Static dischargers	CHECK
Lower fuselage structure (tail impact on runway)	CHECK CONDITION
Flight records access door	CLOSED
Fuel ventilation overpressure disc	INTACT

Ident.: PRO-NOR-SOP-05-A-00011117.0002001 / 09 NOV 21
Applicable to: ALL

APU

Access door (if not required)	CLOSED
Air intake	CHECK CONDITION
Exhaust	CLEAR
Navigation light	CHECK CONDITION
Fire extinguishing overpressure indication (red disc)	IN PLACE

Ident.: PRO-NOR-SOP-05-A-00011118.0002001 / 09 NOV 21
Applicable to: ALL

LH AFT FUSELAGE

Stabilizer, elevator, fin and rudder	CHECK CONDITION
Outflow valve	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011119.0002001 / 09 NOV 21
Applicable to: ALL

LH LANDING GEAR AND FUSELAGE

Chocks	REMOVED
Wheels and tires	CHECK CONDITION
Brakes and brake wear indicator	CHECK CONDITION
Hydraulic lines	CHECK
Landing gear structure	CHECK
Downlock spring	CHECK
Safety pin	REMOVED

Ident.: PRO-NOR-SOP-05-A-00011120.0001001 / 09 NOV 21
Applicable to: ALL

LH WING TRAILING EDGE

Jettison outlet ❄ .... NO LEAK
Flaps and fairings.......... CHECK CONDITION
Control surfaces.......... CHECK CONDITION
Static dischargers.......... CHECK CONDITION
Antennas on top of fuselage.......... CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011121.0002001 / 09 NOV 21
Applicable to: ALL

LH WING TIP

Navigation and Strobe lights.......... CHECK CONDITION
Slats 7, 6, 5.......... CHECK CONDITION
Surge tank air inlet.......... CLEAR
Fuel water drain valve.......... NO LEAK
Magnetic fuel level(s).......... FLUSH
Wing fence.......... CHECK CONDITION
Fuel ventilation overpressure disc.......... INTACT

Ident.: PRO-NOR-SOP-05-A-00011124.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

LH WING LEADING EDGE

Inner and outer magnetic fuel levels.......... FLUSH
Fuel water drain valve.......... NO LEAK
Slats 4, 3, 2.......... CHECK CONDITION
Refuel coupling door.......... CLOSED

Ident.: PRO-NOR-SOP-05-A-00011124.0003001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO

LH WING LEADING EDGE

Inner and outer magnetic fuel levels.......... FLUSH
Fuel water drain valve.......... NO LEAK
Slats 4, 3, 2.......... CHECK CONDITION
Refuel coupling door.......... CLOSED
Refuel control panel.......... CLOSED

Ident.: PRO-NOR-SOP-05-A-00011125.0006001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

ENG 1 LH SIDE

IDG oil fill access door	CLOSED
Thrust reversers cowl door	CLOSED
Pressure relief doors	CLOSED
Fan cowl doors	CLOSED/LATCHED/FLAG REMOVED
Drain masts	CHECK CONDITION/NO LEAK
Access to starter valve manual override	CLOSED
Access door to reversers latches	CLOSED
Engine inlet and fan blades	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011125.0002001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO

ENG 1 LH SIDE

IDG oil fill access door	CLOSED
Thrust reversers cowl door	CLOSED
Pressure relief doors	CLOSED
Fan cowl door	CLOSED/LATCHED
Drain masts	CHECK CONDITION/NO LEAK
Access to starter valve manual override	CLOSED
Access door to reversers latches	CLOSED
Engine inlet and fan blades	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011125.0004001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

ENG 1 LH SIDE

Thrust reversers pivot doors	CLOSED
Door position sensor harness access	CLOSED
Door pivot and position sensor access	CLOSED
IDG Oil filler access door	CLOSED
Pressure relief and start valve/anti ice valve/reverser GND safety access	CLOSED
Drain masts	CHECK CONDITION/NO LEAK
Thrust reversers cowl doors	CLOSED/LATCHED
Fan cowl doors	CLOSED/LATCHED
Engine inlet and fan blades	CHECK CONDITION

Ident.: PRO-NOR-SOP-05-A-00011126.0006001 / 13 DEC 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

ENG 1 RH SIDE

Engine oil fill access door	CLOSED
Fan cowl doors	CLOSED/LATCHED/FLAG REMOVED
Thrust reverser cowl door	CLOSED
Pressure relief door	CLOSED
Turbine exhaust	CLEAR

Ident.: PRO-NOR-SOP-05-A-00011126.0002001 / 17 MAY 17
Applicable to: LV-KAN, LV-KAO

ENG 1 RH SIDE

Engine oil fill access door	CLOSED
Fan cowl door	CLOSED/LATCHED
Thrust reverser cowl door	CLOSED
Pressure relief door	CLOSED
Turbine exhaust	CLEAR

Ident.: PRO-NOR-SOP-05-A-00011126.0004001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

ENG 1 RH SIDE

Engine oil filler access door	CLOSED
Thrust reversers cowl doors	CLOSED/LATCHED
Fan cowl doors	CLOSED/LATCHED
Master chip detector and HYD drain case filter access	CLOSED
Drain masts	CHECK CONDITION/NO LEAK
Thrust reversers pivot doors	CLOSED
Door position sensor harness access	CLOSED
Door pivot and position sensor access	CLOSED
Turbine exhaust	CLEAR

Ident.: PRO-NOR-SOP-05-A-00011153.0002001 / 09 NOV 21
Applicable to: ALL

LH CENTER WING

Tank magnetic fuel level(s)	FLUSH
Fuel water drain valves	NO LEAK
Water drain valve panel	CLOSED
Landing light	CHECK CONDITION
Slat 1	CHECK CONDITION

GENERAL

Ident.: PRO-NOR-SOP-06-00011855.0001001 / 09 NOV 21
Applicable to: ALL

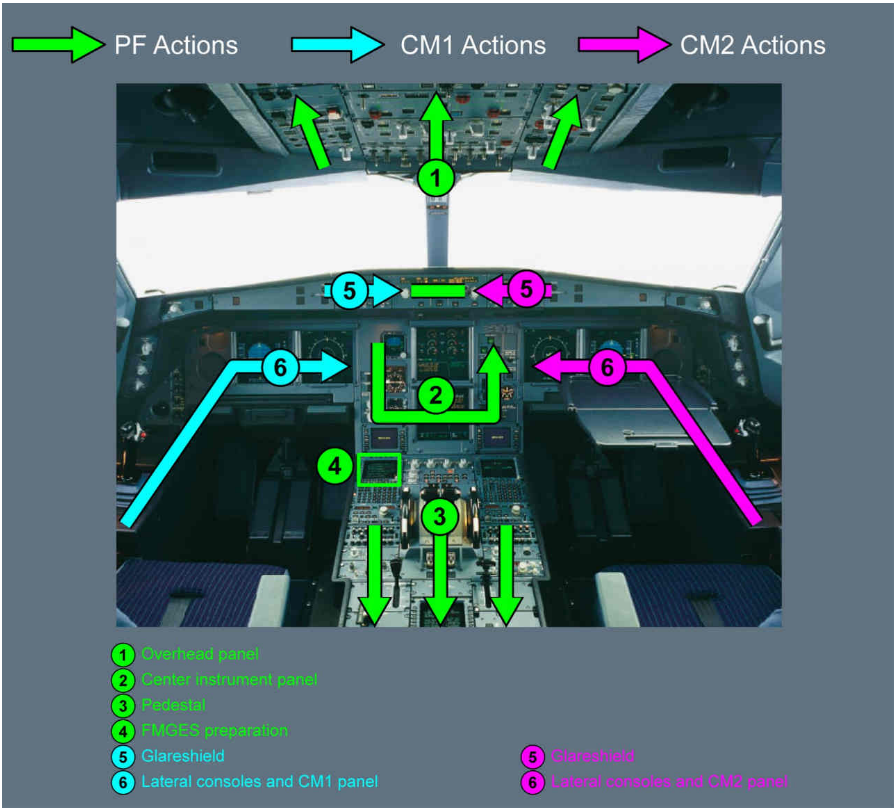
Items marked by (*) are the only steps to be completed after a transit stop without flight crew change. Otherwise, the new flight crew performs all the items.
The PF prepares the overhead panel, the center instrument panel and the pedestal while the PM performs the external walkaround. When both flight crewmembers are seated and the PM checked the FMS, both flight crewmembers continue the cockpit preparation.

WARNING	Do not pressurize the hydraulic systems until clearance is obtained from ground personnel.

FLOW PATTERN

Ident.: PRO-NOR-SOP-06-00019992.0001001 / 24 NOV 23
Applicable to: ALL

COCKPIT PREPARATION FLOW PATTERN


PF Actions
CM1 Actions
CM2 Actions
1
5
5
6
2
6
4
3
① Overhead panel
② Center instrument panel
③ Pedestal
④ FMGES preparation
⑤ Glareshield
⑥ Lateral consoles and CM1 panel
⑤ Glareshield
⑥ Lateral consoles and CM2 panel

OVERHEAD PANEL

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-A-00011857.0001001 / 24 NOV 23

WHITE LIGHTS ON THE OVERHEAD PANEL

- **As a general rule, during the scan sequence of the overhead panel:**

  * ALL WHITE LIGHTS (except MAINTENANCE panel)................................OFF | PF

  Note: - *Depending on Operators policy, some lights may be kept ON during the cockpit preparation*
  - *During the scan of the overhead panel, check also that the only amber lights are the GEN FAULT lights.*

Ident.: PRO-NOR-SOP-06-A-00011858.0001001 / 09 NOV 21

RCDR

* RCDR GND CTL pb-sw...ON | PF

Ident.: PRO-NOR-SOP-06-A-00011859.0001001 / 09 NOV 21

EVAC ◁

CAPT & PURS/CAPT sw..AS RQRD | PF

L2 *Set the CAPT & PURS/CAPT sw on the EVAC panel as per Company Policy.*

Ident.: PRO-NOR-SOP-06-A-00015219.0001001 / 09 NOV 21

RESET

* RESET BUTTONS (left side)..CHECK | PF

L2 *Check that all reset buttons are pushed.*

Ident.: PRO-NOR-SOP-06-A-00011862.0003001 / 09 NOV 21

EXTERIOR LIGHTS

STROBE sw...AUTO | PF
BEACON sw..OFF | PF
WING sw..OFF | PF

L2 *The flight crew may use the WING lights briefly for wing inspection. However, as this light can cause heat damage to the jetway, the flight crew must switch the WING lights off if the jetway is on the aircraft.*

L1 NAV & LOGO sw...AS RQRD | PF

L2 *Set to NAV & LOGO 1 ◁ the NAV & LOGO sw, as required, to turn on the navigation and logo lights (NAV & LOGO LT 2 ◁ is used only when NAV & LOGO LT 1 ◁ fails).*

L1 REMAINING EXTERIOR LIGHTS....................AS RQRD | PF

Ident.: PRO-NOR-SOP-06-A-00011863.0012001 / 24 NOV 23

SIGNS

* SIGNS panel....................SET | PF

L2
- *Set the SEAT BELTS sw to ON when refueling is complete. For more information, Refer to CCOM/13-130 REFUELING/DEFUELING PROCEDURE WITH PASSENGERS ON BOARD*
- *Set the EMER EXIT LT sw to ARM*
- *Set the other switches, as required.*

Ident.: PRO-NOR-SOP-06-A-00010912.0001001 / 09 NOV 21

PROBE/WINDOW HEAT

PROBE/WINDOW HEAT pb-sw....................AUTO | PF

Ident.: PRO-NOR-SOP-06-A-00011864.0001001 / 09 NOV 21

CABIN PRESS

LDG ELEV knob....................AUTO | PF
MAN VALVE SEL selector....................BOTH | PF

Ident.: PRO-NOR-SOP-06-A-00011865.0001001 / 09 NOV 21

AIR COND

* PACK FLOW selector....................AS RQRD | PF

L2 *SELECT:*

LO : if less than 60 % of the seats in the economy class are occupied, but not more than 200 passengers in all classes

HI : for abnormally hot and humid conditions

NORM : for all other normal operating cases.

If APU is supplying, pack controllers select HI flow automatically, independently of selector position.

Ident.: PRO-NOR-SOP-06-A-00011866.0001001 / 24 NOV 23

ELEC

EL/DC pb (on the ECAM Control Panel)....................PRESS | PF
BAT 1 pb-sw, BAT 2 pb-sw and APU BAT pb-sw....................OFF then AUTO | PF

L2 *This action initiates a charging cycle of the batteries.*

L1 10 s after setting all BAT pb-sw to AUTO, check on the ELEC DC SD page that the current charge of the battery is below 60 A, and is decreasing.

- **If the charge of at least one battery is not below 60 A:**
  Wait until the end of the charging cycle of the batteries (batteries no longer connected to DC BAT/APU buses) and perform this check again.

Ident.: PRO-NOR-SOP-06-A-00011867.0001001 / 24 NOV 23

FUEL

T TANK MODE pb-sw....................CHECK AUTO | PF
T TANK FEED selector....................CHECK AUTO | PF

Ident.: PRO-NOR-SOP-06-A-00011869.0001001 / 09 NOV 21

ENG 1 – ENG 2 FIRE

ENG 1 FIRE pb-sw and ENG 2 FIRE pb-sw....................CHECK IN and GUARDED | PF
AGENT 1 and AGENT 2 lights....................CHECK OFF | PF
ENG TEST pb....................PRESS and MAINTAIN | PF

L2 *The flight crew should maintain the TEST pb pressed during the time of the test.*

L1 **TEST RESULT**

Check that all ENG FIRE detection and extinguishing systems are operative:
- The continuous repetitive chime (CRC) sounds
- The MASTER WARN lights flash
- The ECAM displays the ENG 1 FIRE, ENG 2 FIRE alerts
- All ENG FIRE pb-sw come on red
- All SQUIB lights of the AGENT pb come on
- All DISCH lights of the AGENT pb come on
- All FIRE lights on the ENG MASTER panel come on.

Ident.: PRO-NOR-SOP-06-A-00011871.0001001 / 05 MAY 22

MAINTENANCE PANEL

ALL LIGHTS....................CHECK | PF

Ident.: PRO-NOR-SOP-06-A-00010914.0001001 / 05 MAY 22

CARGO AIR COND

TEMPERATURE selectors....................AS RQRD | PF
FWD COOLING selector....................AS RQRD | PF

Ident.: PRO-NOR-SOP-06-A-00011872.0002001 / 24 NOV 23

THIRD OCCUPANT AUDIO CONTROL PANEL

PA (3rd occupant)....................RECEPT | PF

L2
- *This action enables to record the cabin attendant announcements on the CVR*
- *For proper recording, set the volume at or above medium range.*

Ident.: PRO-NOR-SOP-06-A-00011873.0001001 / 09 NOV 21

CVR

CVR TEST pb ....PRESS and MAINTAIN | PF

L2 *For CVR TEST description, Refer to DSC-23-10-40 CVR Panel.*

Note: If no 22RK headset is available, the Larsen effect can also be reduced by preventing the cockpit ambient microphone from picking up the ambient sound (i.e. by temporarily covering it during the test).

Ident.: PRO-NOR-SOP-06-A-00015220.0001001 / 09 NOV 21

RESET

* RESET BUTTONS (right side)....................CHECK | PF

L2 *Check that all reset buttons are pushed.*

Ident.: PRO-NOR-SOP-06-A-00011870.0003001 / 09 NOV 21

DATA LOADER

DATA LOADER....................CHECK OFF | PF

CTR INSTRUMENT PANEL

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-B-00011875.0001001 / 09 NOV 21

ISIS

* ISIS....................CHECK | PF

L2
- *Adjust brightness.*
- *Check IAS, altimeter readings, altimeter settings and attitude display.*
- *Check no flags - Reset attitude, if necessary.*

Note: Use of ISIS bugs function is not recommended (Refer to DSC-34-10-20 ISIS).

L1 * NORTH REF....................CHECK | PF

L2 *Check TRUE blue light off.*

Ident.: PRO-NOR-SOP-06-B-00011876.0001001 / 09 NOV 21

ECAM SWITCHING PANEL

DMC selector....................CHECK AUTO | PF
ECAM/ND selector....................CHECK NORM | PF

Ident.: PRO-NOR-SOP-06-B-00011878.0002001 / 09 NOV 21

CLOCK

* CLOCK....................CHECK/SET | PF

L2 *Note:* *1. If the clock is readjusted for a value above ten days, maintenance must perform the Wing Tip Brake engagement test.*
2. To comply with the time precision requirement (+/- 1 s UTC) for ATC datalink communication, the flight crew must either:

- *Use the clock in GPS mode, or*
- *Use the clock in INT mode and synchronize the clock with the GPS at least one time per day. This synchronization ensures that the UTC time drift is below +/- 1 s UTC.*

For more information on the setting of the clock, Refer to DSC-31-55-10 General.
For more information on the use of the internal (INT) mode, Refer to DSC-31-55-20 Operation in Internal Mode.

Ident.: PRO-NOR-SOP-06-B-00011879.0001001 / 09 NOV 21

LANDING GEAR

LDG GEAR GRVTY EXTN selector....................OFF | PF
* A/SKID & N/W STRG sw....................ON | PF

PEDESTAL

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-C-00011889.0001001 / 24 NOV 23

RMP

RMP ....CHECK ON/SET | PF
Green NAV light....................CHECK OFF | PF
SEL light....................CHECK OFF | PF

COM FREQUENCIES............TUNE | PF

L2 *Use VHF 1 for ATC (only VHF 1 is available in emergency electrical configuration), VHF 2 for ATIS and company frequencies. VHF 3 is normally devoted to ACARS.*

Ident.: PRO-NOR-SOP-06-C-00011880.0001001 / 09 NOV 21

ACP

INT knob............PRESS OUT/VOLUME CHECK | PF

L2 *Ensure that INT volume is turned up, to enable contact with the ground crew.*

L1 VHF............CHECK | PF

L2 *Check transmission and reception.*

L1 HF (if required for flight)............CHECK | PF

L2 *Check transmission and reception.*

CAUTION	- *Do not transmit on HF during refueling operations (i.e. refueling, defueling, fuel transfer)* - *Only perform HF radio checks when appropriate (i.e. no personnel in the immediate vicinity).*

Ident.: PRO-NOR-SOP-06-C-00011882.0001001 / 03 NOV 22

PARKING BRK

* ACCU PRESS indicator............CHECK | PF

L2 *The ACCU PRESS indication must be in the green band. If required, use the electric pump on blue hydraulic system to recharge the brake accumulator.*

L1

WARNING	The blue electric pump pressurizes the blue hydraulic system. Get ground crew clearance before to use the electric pump.

* PARK BRK handle............CHECK ON | PF
* BRAKE PRESS indicator............CHECK | PF

L2 *Check for normal indication on the ACCU and BRAKES PRESS indicator.*

L1 ● **If brakes are hot and chocks are in place:**

PARK BRK handle............OFF | PF

L2 *Releasing the parking brake prevents the critical structures from being exposed to high temperature levels for an extended time. However, if operational conditions require (e.g. slippery tarmac), the parking brake may remain applied.*

Ident.: PRO-NOR-SOP-06-C-00011883.0002001 / 24 NOV 23

COCKPIT DOOR

If required by local Airworthiness Authorities:

ANN LT selector.......................................TEST | PF

L2 *Check that the OPEN and FAULT light (on the pedestal), and the three LED lights (on the overhead panel) come on.*

L1 ANN LT selector.......................................BRT | PF

L2 *Check that all lights go off.*

L1 COCKPIT DOOR.......................................CHECK CORRECT OPERATION | PF

L2 - *Set the COCKPIT DOOR sw to the UNLOCK position. Check that the door opens, and that the OPEN light comes on.*

L2 - *Then, with the door fully opened, release the toggle switch (check that it returns to the NORM position). Close the door. Check that it is locked, and that the OPEN indication goes off.*

L1 COCKPIT DOOR MECHANICAL OVERRIDE.......................................CHECK | PF

L2 *Check that the door opens normally, and that it closes when the mechanical override is used.*

L1 * COCKPIT DOOR sw.......................................NORM | PF

Ident.: PRO-NOR-SOP-06-C-00011884.0001001 / 09 NOV 21

SWITCHING PANEL

All selectors.......................................CHECK NORM | PF

Ident.: PRO-NOR-SOP-06-C-00011887.0001001 / 24 NOV 23

ENGINES

* THRUST levers.......................................IDLE | PF
* THRUST REVERSER levers.......................................STOWED | PF
* ENG MASTER levers.......................................CHECK OFF | PF
* ENG START selector.......................................NORM | PF

Ident.: PRO-NOR-SOP-06-C-00011888.0001001 / 24 NOV 23

ATC

* ATC.......................................STBY | PF
* TCAS.......................................STBY | PF

L2 *To prevent possible interference to radar surveillance systems, TCAS should not be selected before the holding point/lining up.*

L1 ALT RPTG.......................................ON | PF

* ATC SYS 1 .... SELECT | PF

L2 *For RVSM operations (Refer to PRO-SPO-50 Required Equipments/Functions for RVSM), select SYS 1 if AP 1 is used, and SYS 2 if AP 2 is used.*
Only system 1 is available in the Emergency Electrical Configuration.

ATC DATALINK COMMUNICATION

Ident.: PRO-NOR-SOP-06-00013823.0001001 / 09 NOV 21
Applicable to: ALL

* MSG .... ERASE | PF

L2 *Press ATC COMM key of the MCDU and display the MSG LOG page.*
Then, erase the MSG LOG file.

Note: *Erase the record of CPDLC message of the previous flight before starting a new flight where CPDLC will be used. This avoid confusing CPDLC message from the previous flight with the ones of the current flight.*

L1 * ADS .... CHECK ARMED | PF

L2 *Press the ATC COMM key on the MCDU and display the CONNECTION STATUS page.*
Check if the ADS is armed. If not, arm the ADS.

FMGES PREPARATION

Ident.: PRO-NOR-SOP-06-D-00011893.0001001 / 09 NOV 21
Applicable to: ALL

GENERAL

At electrical power-up, the FMGSs and FCU run through various internal tests. Allow enough time (3 min) for tests' completion, and do not start to press pushbuttons until the tests are over. If the “PLEASE WAIT” message appears, do not press any MCDU key until the message clears.

In the case of ACARS ◁ operations, or EFB operations with SYNCHRO AVIONICS ◁ , the following actions are already performed in the section "FMGS Pre-Initialization" of the PRELIMINARY COCKPIT PREPARATION procedure and do not need to be performed again:

- ENGINE & AIRCRAFT TYPE check
- FM database validity check
- Flight plan initialization:
  - FLT NBR insertion
  - FROM/TO insertion.

Refer to PRO-NOR-SOP-04 EFB/ACARS Init - FMGS Pre-Initialization - General,

Ident.: PRO-NOR-SOP-06-D-00011894.0001001 / 09 NOV 21
Applicable to: ALL

ENGINE AND AIRCRAFT TYPE

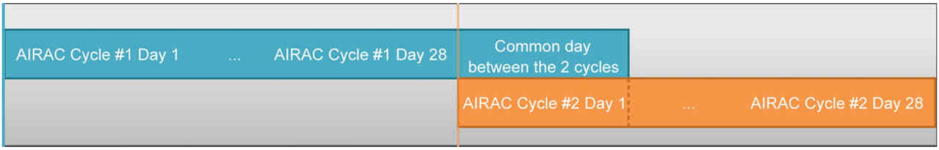
* ENGINE & AIRCRAFT TYPE.. CHECK | PF

Ident.: PRO-NOR-SOP-06-D-00011895.0001001 / 09 NOV 21
Applicable to: ALL

FM DATABASE VALIDITY

* FM database validity.. CHECK | PF

L2
- *Check database validity and stored WPT/NAVAIDS/RWY/ROUTES, if any. If applicable, review the stored data for deletion decision.*
- *On Honeywell FM, the double AIRAC cycle of the NDB has one day in common (AIRAC Cycle #1 Day 29 / AIRAC Cycle #2 Day 1). From Day 2 of AIRAC Cycle #2, the active database is no longer valid and the message CHECK DATA BASE CYCLE will be triggered.*
  On the common day, select AIRAC Cycle #2.



Ident.: PRO-NOR-SOP-06-D-00026317.0001001 / 24 NOV 23
Applicable to: ALL

IDLE / PERF FACTOR

* IDLE / PERF FACTOR...CHECK | PF

L2 *Refer to DSC-22_20-40-30 Procedure to Modify the PERF and IDLE Factors.*

Ident.: PRO-NOR-SOP-06-D-00011896.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

NAVAID DESELECTION

* NAVAID DESELECTION...AS RQRD | PF

L2 *If NOTAMs warn of any unreliable or unserviceable DME or VOR/DME, access to the SELECTED NAVAIDS page, and deselect the related NAVAID.*

Ident.: PRO-NOR-SOP-06-D-00011896.0003001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

NAVAID DESELECTION

* NAVAID DESELECTION...AS RQRD | PF

L2 *If NOTAMs warn of any unreliable or unserviceable DME or VOR/DME, access to the SELECTED NAVAIDS page, and deselect the related NAVAID.*

Ident.: PRO-NOR-SOP-06-D-00011897.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

FLIGHT PLAN INITIALIZATION

* FLIGHT PLAN INITIALIZATION...COMPLETE | PF

L2
- *Press the INIT key.*
- *Insert CO RTE or city pair, and check FROM/TO.*
- *Check/modify ALTN/CO RTE.*
- *Enter flight number.*

Note: For ATC needs, the crew should enter exactly the entire flight number, as shown on the ICAO flight plan, without inserting any space, on the MCDU INIT page.

- *Enter (and/or check) cost index.*
- *Enter intended initial CRZ FL, or check it if it was already supplied by the database. Modify it, if necessary, taking into account ATC constraints or expected gross weight.*
- *Check and modify CRZ FL TEMP and tropopause level to agree with forecast.*
- *Check latitude/longitude.*

Ident.: PRO-NOR-SOP-06-D-00011897.0016001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

FLIGHT PLAN INITIALIZATION

* FLIGHT PLAN INITIALIZATION...COMPLETE | PF

L2
- *Press the INIT key.*
- *Insert CO RTE or city pair, and check FROM/TO.*
- *Check/modify ALTN/CO RTE.*
- *Enter flight number.*

Note: For ATC needs, the crew should enter exactly the entire flight number, as shown on the ICAO flight plan, without inserting any space, on the MCDU INIT page.

- *Enter (and/or check) cost index.*
- *Enter intended initial CRZ FL, or check it if it was already supplied by the database. Modify it, if necessary, taking into account ATC constraints or expected gross weight.*
- *Check and modify CRZ FL TEMP and tropopause level to agree with forecast.*

- *Press IRS INIT page prompt.*
- *Check latitude/longitude.*

Ident.: PRO-NOR-SOP-06-D-00011898.0001001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

ADIRS POSITION INITIALIZATION

* ADIRS POSITION INITIALIZATION..AS APPROPRIATE | PF

L2 *Confirm or insert position coordinates for the IRS alignment.*

L1 *Refer to FCTM/PR-NP-SOP-60 FMGES Preparation.*

- Between latitude 73 ° and 82 °, the IRS alignment should last at least 15 min.
  After the start of the IRS alignment procedure, wait 15 min. Then press the ALIGN IRS prompt.

Ident.: PRO-NOR-SOP-06-D-00011898.0004001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ADIRS POSITION INITIALIZATION

* ADIRS POSITION INITIALIZATION..AS APPROPRIATE | PF

L2 *Confirm or insert position coordinates for the IRS alignment.*

L1 *Refer to FCTM/PR-NP-SOP-60 FMGES Preparation.*

L2 IRS Alignment Based on GPS ◁ Position available:
The position initialization is automatic. The position for the initialization of the IRS is the GPS position. However, the flight crew can manually override the automatic position initialization. The IRS crosschecks the flight crew's manual entry with the GPS position.

IRS Alignment Based on GPS ◁ Position not available:
Apply the manual position initialization procedure.

Ident.: PRO-NOR-SOP-06-D-00011899.0004001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

ACTIVE F-PLN CHECK

* F-PLN A page..COMPLETE AND CHECK | PF

L2 *If CO RTE has been inserted, the F-PLN should automatically include the preferential or most probable takeoff runway, approach and landing runway, associated SIDs, STARs, transition and enroute waypoints. However, some databases will only include departure and arrival airport IDENTs and enroute waypoints.*

The flight crew must check, modify, or insert (as applicable) the F-PLN in the following order according to the data given by ATIS, ATC or MET:

- *Lateral revision at departure airport. Select RWY, then SID, then TRANS, using the scroll keys*

  Note: On the MCDU DEPARTURES page, select only a runway associated with an ILS or NO NAVAIDS.

- *Lateral revision at WPT for ROUTE modification, if needed. For more information on lateral revision, Refer to DSC-22_20-30-10-05 Lateral Revisions.*
- *Vertical revision. Check or enter climb speed limit and speed constraints according to ATC clearance. Enter step altitude, as appropriate.*

L1 * WINDS...AS APPROPRIATE | PF

L2 *Choose between TRIP WIND (INIT FUEL PRED page), or forecast wind, for CLB, CRZ and DES phase. For detail, Refer to DSC-22_20-30-20-25 Wind - Temperature - QNH - Entering the Trip Wind and Temperature During the F-PLN Initialization.*

L1 * F-PLN... CHECK | PF

L2
- *Check the F-PLN, either by using the ROUTE SELECTION page versus ATC F-PLN or F-PLN page, or the ND PLAN mode versus the computer (paper) flight plan or navigation chart*
- *Check DIST TO DEST along the F-PLN. Compare it with the total distance computed for the flight with the computer (paper) flight plan.*

Ident.: PRO-NOR-SOP-06-D-00011899.0001001 / 24 NOV 23
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

ACTIVE F-PLN CHECK

* F-PLN A page..COMPLETE AND CHECK | PF

L2 *If CO RTE has been inserted, the F-PLN should automatically include the preferential or most probable takeoff runway, approach and landing runway, associated SIDs, STARs, transition and enroute waypoints. However, some databases will only include departure and arrival airport IDENTs and enroute waypoints.*

The flight crew must check, modify, or insert (as applicable) the F-PLN in the following order according to the data given by ATIS, ATC or MET:
- *Lateral revision at departure airport. Select RWY, then SID, then TRANS, using the scroll keys*

  Note: *On the MCDU DEPARTURE page, select only a runway associated with an ILS or NO NAVAIDS.*

- *Lateral revision at WPT for ROUTE modification, if needed. For more information on lateral revision, Refer to DSC-22_20-30-10-05 Lateral Revisions.*
- *Vertical revision. Check or enter climb speed limit and speed constraints according to ATC clearance. Enter step altitude, as appropriate.*

L1 * WINDS....................AS APPROPRIATE | PF

L2 *Choose between TRIP WIND (INIT B page), or forecast wind, for CLB, CRZ and DES phases. For detail, Refer to DSC-22_20-30-20-20 WIND - TEMPERATURE - QNH - ENTERING THE TRIP WIND AND TEMPERATURE DURING THE F-PLN INITIALIZATION.*

L1 * F-PLN....................CHECK | PF

L2
- *Check the F-PLN, either by using the ROUTE SELECTION page versus ATC F-PLN or F-PLN page, or the ND PLAN mode versus the computer (paper) flight plan or navigation chart*
- *Check DIST TO DEST along the F-PLN. Compare it with the total distance computed for the flight with the computer (paper) flight plan.*

Ident.: PRO-NOR-SOP-06-D-00011900.0001001 / 09 NOV 21
Applicable to: ALL

SECONDARY F-PLN

* SECONDARY FLIGHT PLAN....................AS APPROPRIATE | PF

L2 *This is routinely a copy of the active flight plan. However, consideration may be given to the following:*
- *Copy the active F-PLN, but modify it at a suitable WPT for an immediate return to the departure airfield in the event of, for example, engine failure.*
- *If weather is below landing minimums at the departure airfield, the secondary flight plan should be that required for a diversion immediately after takeoff.*
- *If there is a chance of a runway or SID change during taxi, prepare for it by copying the active flight plan and making the necessary modifications.*

Ident.: PRO-NOR-SOP-06-D-00011901.0001001 / 09 NOV 21
Applicable to: ALL

RADIO NAV

* RADIO NAV..........CHECK | PF

L2
- *Check the VOR, ILS / GLS and ADF tuned by the FMGEC.*
- *Modify them, if required, and check that the correct identifier is displayed on the ND and PFD (VOR, ILS / GLS , ADF). If unsatisfactory, go through the audio check. For GLS , no audio check is necessary.*

Ident.: PRO-NOR-SOP-06-D-00011902.0015001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

GROSS WEIGHT INSERTION (INIT FUEL PRED PAGE)

* ZFWCG/ZFW..........INSERT | PF
* BLOCK FUEL..........INSERT | PF

L2 *Block fuel may be automatically computed by the FMGEC, using the FLIGHT PLANNING function.*

CAUTION	*Part of characteristic speeds, displayed on the PFD (green dot, F, S, VLS), are computed from the ZFW and ZFWCG entered by the flight crew on the MCDU. In addition, the pitch trim will be automatically set to the takeoff position, according to the entered ZFWCG. Therefore, this data must be carefully checked (Captain's responsibility).*

- *The flight crew should insert the weights after completing all other insertions. This is to avoid cycles of prediction computations at each change in flight plan, constraints, etc.*
- *If ZFW and ZFWCG are not available it is acceptable to enter the expected values in order to obtain predictions. Similarly the flight crew may enter the expected fuel on board, if refueling has not been completed at that time*
- *If ZFW, ZFWCG, and BLOCK FUEL are inserted, the FM will provide all predictions, as well as the EXTRA fuel, if any.*

Ident.: PRO-NOR-SOP-06-D-00011902.0014001 / 03 NOV 21
Applicable to: LV-KAN, LV-KAO

GROSS WEIGHT INSERTION (INIT FUEL PRED PAGE)

* ZFWCG/ZFW..........INSERT | PF
* BLOCK FUEL..........INSERT | PF

L2 *Block fuel may be automatically computed by the FMGEC, using the FLIGHT PLANNING function.*

CAUTION	*Part of characteristic speeds, displayed on the PFD (green dot, F, S, VLS), are computed from the ZFW and ZFWCG entered by the flight crew on the MCDU. Therefore, this data must be carefully checked (Captain's responsibility).*

- *The flight crew should insert the weights after completing all other insertions. This is to avoid cycles of prediction computations at each change in flight plan, constraints, etc.*
- *If ZFW and ZFWCG are not available it is acceptable to enter the expected values in order to obtain predictions. Similarly the flight crew may enter the expected fuel on board, if refueling has not been completed at that time*
- *If ZFW, ZFWCG, and BLOCK FUEL are inserted, the FM will provide all predictions, as well as the EXTRA fuel, if any.*

Ident.: PRO-NOR-SOP-06-D-00011902.0001001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP

GROSS WEIGHT INSERTION (INIT B PAGE)

* ZFWCG/ZFW.. INSERT PF
* BLOCK FUEL..INSERT PF

L2 *Block fuel may be automatically computed by the FMGEC, using the FLIGHT PLANNING function.*

CAUTION	*Part of characteristic speeds, displayed on the PFD (green dot, F, S, VLS), are computed from the ZFW and ZFWCG entered by the crew on the MCDU. Therefore, this data must be carefully checked (Captain's responsibility).*

- *The flight crew should insert the weights after completing all other insertions. This is to avoid cycles of prediction computations at each change in flight plan, constraints, etc.*
- *If ZFW and ZFWCG are not available it is acceptable to enter the expected values in order to obtain predictions. Similarly the flight crew may enter the expected fuel on board, if refueling has not been completed at that time.*
- *If ZFW, ZFWCG, and BLOCK FUEL are inserted, the FM will provide all predictions, as well as the EXTRA fuel, if any.*

Ident.: PRO-NOR-SOP-06-D-00011902.0006001 / 24 NOV 23
Applicable to: LV-KHT, LV-KHU

GROSS WEIGHT INSERTION (INIT B PAGE)

* ZFWCG/ZFW.. INSERT
* BLOCK FUEL...INSERT

L2 *Block fuel may be automatically computed by the FMGEC, using the FLIGHT PLANNING function.*

CAUTION	*Part of characteristic speeds, displayed on the PFD (green dot, F, S, VLS), are computed from the ZFW and ZFWCG entered by the crew on the MCDU. In addition, the pitch trim will be automatically set to the takeoff position, according to the entered ZFWCG. Therefore, this data must be carefully checked (Captain's responsibility).*

- *The flight crew should insert the weights after completing all other insertions. This is to avoid cycles of prediction computations at each change in flight plan, constraints, etc.*
- *If ZFW and ZFWCG are not available it is acceptable to enter the expected values in order to obtain predictions. Similarly the flight crew may enter the expected fuel on board, if refueling has not been completed at that time.*
- *If ZFW, ZFWCG, and BLOCK FUEL are inserted, the FM will provide all predictions, as well as the EXTRA fuel, if any.*

Ident.: PRO-NOR-SOP-06-D-00011903.0010001 / 24 NOV 23
Applicable to: ALL

TAKEOFF DATA INSERTION (PERF TAKEOFF PAGE)

The PF inserts the takeoff data in the PERF TAKEOFF page of the MCDU.

* T.O SHIFT..AS RQRD | PF

L2 *If the aircraft takes off from an intersection, insert a T.O shift value (even when GPS PRIMARY* ◁ *is active) to increase flight crew awareness of the runway length reduction.*

L1
* V1, VR, V2..INSERT | PF
* FLEX TO TEMP/DERATE..INSERT | PF
* THR RED/ACC altitude..SET or CHECK | PF
* ENG OUT ACC altitude..SET or CHECK | PF
* FLAPS/THS..INSERT | PF

L2 *The THS can be left blank until the load sheet is received. When entered in the MCDU, the THS value will be used to trigger the F/CTL PITCH TRIM/MCDU/CG DISAGREEalert.*

Ident.: PRO-NOR-SOP-06-D-00011904.0001001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

RNP INSERTION (PROG PAGE)

* RNP..SET or CHECK | PF

L2 *For RNP AR departure, check or insert the RNP.*

Ident.: PRO-NOR-SOP-06-D-00020964.0001001 / 09 NOV 21
Applicable to: ALL

DERATED CLIMB ◁ LEVEL INSERTION

* DERATED CLIMB..AS RQRD | PF

L2 *If a derated climb is planned, insert the derated climb level (D1 or D2) in the DRT CLB field of the MCDU PERF CLB page.*

Ident.: PRO-NOR-SOP-06-D-00011905.0001001 / 09 NOV 21
Applicable to: ALL

CLIMB, CRUISE, DESCENT SPEED PRESELECTION

* PRESET SPEEDS.. AS RQRD | PF

L2 *If the flight is cleared for a close-in turn or close-in altitude constraint, the flight crew may preselect green dot speed on the PERF CLB page. Once the CLB phase is active, the preselected speed will be displayed in the FCU speed window and on the PFD as a selected speed (blue symbol). Once the turn is completed or the altitude cleared, the pilot will resume the managed speed profile by pressing the SPD/MACH knob on the FCU. Similarly, the pilot may select a CRZ MACH number on the PERF CRZ page (constant CRZ Mach segment, for example). When the CRZ phase is active, the preselected CRZ MACH number will be displayed in the FCU speed window and on the PFD. When ECON MACH number may be resumed, the crew presses the FCU SPD/MACH knob selector.*

In either of the above cases, the pilot may cancel the CLB or CRZ preselected SPD/MACH prior to activating the related phase, by selecting ECON on the PERF CLB or CRZ pages.

SPD LIM is defaulted to 250 kt below 10 000 ft in the managed speed profile. This may either be cleared, or modified, on the VERT REV page at the origin (or a climb waypoint).

Ident.: PRO-NOR-SOP-06-D-00015238.0001001 / 05 MAY 22
Applicable to: ALL

CHECK OF FMGES PREPARATION:

* FMS PREPARATION... CROSSCHECK | PM

L2 *After the PF prepares the FMS, the PM checks all the data entered in the FMS. This check includes a crosscheck between:*

- *Waypoints of the expected departure route that include constraints*
- *Waypoints of the flight plan and the computerized flight plan*
- *Initial cruise altitude and the computerized flight plan*
- *Total track miles and the computerized flight plan*
- *Fuel remaining at destination and the computerized flight plan*
- *Performance data displayed on the PM's EFB with the PERF TAKE OFF page. This includes modifications of the THR RED/ACCEL/EO ACCEL settings, if applicable*
- *TRANS ALT in the ACTIVE/PERF page*
- *Setup of the SEC flight plan.*

The PM should have the same mental image of the intended departure procedure, trajectory, and constraints as the PF. The PM should check with the PF if anything is not clear.

L1 * EFB/MCDU GREEN DOT..COMPARE | PM

L2 *The PM compares Green Dot speed computed by the FMGES and the Green Dot speed computed using the TAKEOFF application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGES).*

GLARESHIELD

Applicable to: ALL

Ident.: PRO-NOR-SOP-06-E-00011907.0001001 / 09 NOV 21

LOUDSPEAKER

* LOUDSPEAKER knob..SET | PF-PM

L2 *Set the LOUDSPEAKER knob around the 1 o'clock position.*

Ident.: PRO-NOR-SOP-06-E-00020728.0001001 / 06 NOV 23

EFIS CONTROL PANEL

* BAROMETRIC REFERENCE..SET/CROSSCHECK | BOTH

L2
- *Set QNH on the EFIS control panel and on the standby altimeter*
- *Check the barometric reference and altitude indications on the PFDs and on the standby altimeter.*

  The maximum difference is:
  ±20 ft between both PFDs
  And depending on the aircraft configuration:
  ±60 ft between ISIS ◁ and PFDs, or
  ±300 ft between mechanical standby altimeter and PFDs.

L1
* FD..CHECK ON | PF-PM
* LS..AS RQRD | PF-PM
* ND MODE and RANGE..AS RQRD | PF-PM
* ADF ◁ /VOR sw..AS RQRD | PF-PM

L2 *Display VOR and ADF ◁ pointers as required.*

Ident.: PRO-NOR-SOP-06-E-00011909.0001001 / 10 MAY 22

FCU

* SPD/MACH window..DASHED | PF
* HDG-V/S / TRK-FPA pb..HDG-V/S | PF
* ALT window..INITIAL EXPECTED CLEARANCE ALTITUDE | PF

Note: *Do not engage the autothrust on ground, as it may generate the AUTO FLT A/THR OFF warning at engine start.*

LATERAL CONSOLES

Ident.: PRO-NOR-SOP-06-00011910.0001001 / 24 NOV 23
Applicable to: ALL

WARNING	To prevent hearing damage to the ground crew connected to the intercom system, inform them that a loud noise may be heard in the headset when performing the oxygen mask test.

● **On the mask stowage box of each occupied station:**

OXYGEN MASK TEST .... PERFORM | PF-PM

L2 *For a detailed test of the mask, Refer to DSC-35-20-30 How to Test the Mask.*

L1 ● **On the ECAM DOOR/OXY SD page:**

REGUL LO PR indication .... CHECK NOT DISPLAYED | PF-PM

Note: *The crew must perform this check after having checked all masks. It ensures that the LP valve is open (due to residual pressure between the LP valve and the oxygen masks, an LP valve failed in the closed position may not be detected during the oxygen mask test).*

INSTRUMENT PANELS

Ident.: PRO-NOR-SOP-06-00011911.0001001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP

EFIS DMC selector .... CHECK NORM | PF-PM
PFD and ND brightness knob .... AS RQRD | PF-PM

L2 *Check the ND outer ring is set to maximum brightness (radar/terrain display).*

L1 * PFD .... CHECK | PF-PM

L2
- *Check PFD/ND not transferred*
- *Check for correct display, when ATT and HDG are available*
- *Check IAS, FMA, initial target ALT, altimeter readings, VSI, altimeter settings, heading and attitude display.*

L1 * ND .... CHECK | PF-PM

L2
- *Check for correct display*
- *Crosscheck MAG HDG indications on the ND and DDRMI*
- *Check heading, initial waypoint, VOR/ADF ◁ indications.*

INSTRUMENT PANELS

Ident.: PRO-NOR-SOP-06-00011911.0002001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

EFIS DMC selector.......................................CHECK NORM | PF-PM
PFD and ND brightness knob.......................................AS RQRD | PF-PM

L2 *Check the ND outer ring is set to maximum brightness (radar/terrain display).*

L1 * PFD.......................................CHECK | PF-PM

L2
- *Check PFD/ND not transferred*
- *Check for correct display, when ATT and HDG are available*
- *Check IAS, FMA, initial target ALT, altimeter readings, VSI, altimeter settings, heading and attitude display.*

L1 * ND.......................................CHECK | PF-PM

L2
- *Check for correct display*
- *Check heading, initial waypoint, VOR/ADF ◁ indications.*

ECAM CONTROL PANEL

Ident.: PRO-NOR-SOP-06-00011885.0001001 / 09 NOV 21
Applicable to: ALL

ECAM CONTROL PANEL

* PRESS pb ....PRESS | PF

L2 *Check that the CAB PRESS SD page displays LDG ELEV AUTO to confirm correct position of the LDG ELEV knob.*

L1 * STS pb ....PRESS | PF

L2 *Check that INOP SYS display is compatible with MEL.*
If a message is displayed in MAINTENANCE STATUS, Refer to MEL/MI-00-08 ECAM and MAINTENANCE STATUS.

ADIRS

Ident.: PRO-NOR-SOP-06-00011912.0001001 / 09 NOV 21
Applicable to: ALL

* IRS ALIGN.......................................CHECK | PM

L2 *On the POSITION MONITOR page, check that the IRS are in NAV mode, and check that the distance between each IRS and the FMS position is lower than 5 NM. Select ND in ROSE-NAV or*

ARC mode, and confirm that the aircraft position is consistent with the position of the airport, the SID and the surrounding NAVAIDs.

FUEL ON BOARD

Ident.: PRO-NOR-SOP-06-00024946.0001001 / 24 NOV 23
Applicable to: ALL

* FUEL ON BOARD..CHECK | PF-PM

L2
- *Check that ECAM FOB corresponds to the block fuel of the computerized flight plan*
- *On FUEL SD page, check that the fuel is correctly balanced and CG is within operational limits*
- *Crosscheck that the sum of the FOB recorded at the end of the last flight and the fuel uplift (if any) is consistent with the current FOB. If an abnormal difference is found, a maintenance action is due.*

FOB after refueling	***Abnormal difference above***
Up to 15 t (33 000 lb)	*600 kg (1 300 lb)*
Between 15 t and 35 t (77 000 lb)	*700 kg (1 500 lb)*
Between 35 t and 55 t (121 000 lb)	*800 kg (1 700 lb)*
Between 55 t and 75 t (165 000 lb)	*900 kg (2 000 lb)*
Between 75 t and 90 t (198 000 lb)	*1 000 kg (2 200 lb)*
More than 90 t (198 000 lb)	*1 100 kg (2 400 lb)*

DEPARTURE BRIEFING

Ident.: PRO-NOR-SOP-06-00011915.0001001 / 09 NOV 21
Applicable to: ALL

* DEPARTURE BRIEFING..PERFORM | BOTH

COCKPIT PREPARATION CHECKLIST

Ident.: PRO-NOR-SOP-06-00024947.0001001 / 05 MAY 22
Applicable to: ALL

* COCKPIT PREPARATION C/L..COMPLETE | PF-PM

Intentionally left blank

BEFORE PUSHBACK/START CLEARANCE

Applicable to: ALL

Ident.: PRO-NOR-SOP-07-A-00021319.0001001 / 24 NOV 23

LOADSHEET

FINAL LOADSHEET.......... CHECK | PF-PM

L2 *Both crew members carefully check the LTS, particularly for gross errors. Make sure that the loadsheet data is correct (e.g. correct flight, correct aircraft, dry operating index, configuration, Fuel on Board, etc.).*

L1 ZFW/ZFWCG.......... CHECK/REVISE | PF

L2 *The PF compares the ZFW and the ZFWCG with the previously-entered data, and adjust if necessary.*

L1 ZFW/ZFWCG.......... CROSSCHECK | PM

L2 *The PM crosschecks the ZFW and the ZFWCG entered in the FMS.*

L1 LOADSHEET CG and ECAM CG.......... CHECK | PF-PM

L2 *Check the loadsheet CG vs. the ECAM CG:*

- *If the difference is less than 2 %, no further action is required. Rely on ECAM CG*
- *If there is more than 2 % difference, check that the ZFW and the ZFWCG have been correctly inserted in the MCDU, then rely on ECAM CG.*

Check that the takeoff CG is within LTS operational limits.

Ident.: PRO-NOR-SOP-07-A-00011914.0001001 / 24 NOV 23

FUEL

FUEL ON BOARD.......... CHECK | PF-PM

L2
- *Check that ECAM FOB corresponds to the computerized flight plan*
- *On the FUEL SD page, check that the FOB corresponds to the loadsheet.*

Ident.: PRO-NOR-SOP-07-A-00021320.0001001 / 18 NOV 21

TAKEOFF DATA

- **If takeoff conditions changed:**

L2 For more information, *Refer to FCTM/PR-NP-SOP-BEFORE PUSHBACK OR START-Takeoff Data*.

L1 FINAL TAKEOFF PERF DATA.......... RECOMPUTE | PF-PM

L2 *The PF and the PM independently compute again the takeoff performance data.*

L1 FMS TAKEOFF DATA.. REVISE | PF

L2 *The PF revises the takeoff data in the FMS.*
If the flight crew uses the optimum configuration option for the computation, they should pay specific attention to changes to the configuration of the slats/flaps at takeoff.

L1 FMS REVISED TAKEOFF PERF DATA.......................................CROSSCHECK | PM

L2 *The PM crosschecks the performance data displayed on the PM's EFB with the FMS PERF T.O page.*

L1 EFB/MCDU GREEN DOT.. COMPARE | PM

L2 *The PM compares Green Dot speed computed by the FMGS and the Green Dot speed computed using the TAKEOFF application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGS).*

Ident.: PRO-NOR-SOP-07-A-00011058.0001001 / 24 NOV 23

SEATING POSITION

SEATS, SEAT BELTS, HARNESSES, RUDDER PEDALS, ARMRESTS.....................
.... ADJUST | PF-PM

L2 *The seat is correctly adjusted when the flight crew’s eyes are aligned with the red and white balls.*

Ident.: PRO-NOR-SOP-07-A-00011059.0001001 / 18 NOV 21

MCDU

FMS PERF TO page.. SELECT | PF

L2 *It is recommended to display the PERF TAKEOFF page on the PF side.*

L1 FMS F-PLN page..SELECT | PM

L2 *It is recommended to display the F-PLN page on the PM side.*

Ident.: PRO-NOR-SOP-07-A-00011060.0001001 / 18 NOV 21

AIR CONDITIONING UNIT

AIR CONDITIONING UNITS...CHECK DISCONNECTED | PM

EXTERNAL POWER

EXT PWR pb.. CHECK AVAIL | PM

WARNING Disconnection of the external power with the EXT PWR pb ON may cause injury to the ground engineer. Request disconnection of the external power only with the EXT PWR pb AVAIL.

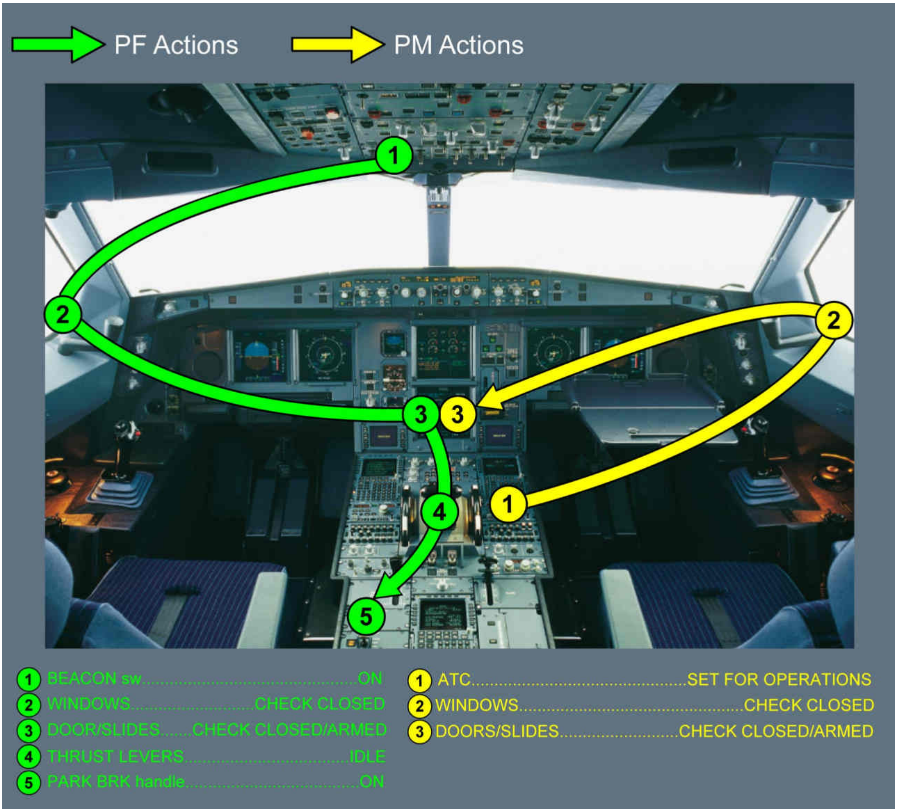
EXT PWR DISCONNECTION...REQUEST | PM

AT PUSHBACK/START CLEARANCE

Applicable to: ALL

Ident.: PRO-NOR-SOP-07-B-00024998.0001001 / 24 NOV 23

BEFORE START FLOW PATTERN



① BEACON sw..ON
② WINDOWS..........................CHECK CLOSED
③ DOOR/SLIDES.......CHECK CLOSED/ARMED
④ THRUST LEVERS..................................IDLE
⑤ PARK BRK handle.....................................ON

① ATC..SET FOR OPERATIONS
② WINDOWS..CHECK CLOSED
③ DOORS/SLIDES.........................CHECK CLOSED/ARMED

Ident.: PRO-NOR-SOP-07-B-00011040.0004001 / 18 NOV 21

PUSHBACK/START CLEARANCE

PUSHBACK/START CLEARANCE.. OBTAIN | PM

L2 *Obtain ATC pushback/start clearance and ground crew clearance.*

Ident.: PRO-NOR-SOP-07-B-00011064.0001001 / 24 NOV 23

EXTERIOR LIGHTS

BEACON sw..ON | PF

L2 *When cleared for start or pushback, set the BEACON sw to ON.*

Ident.: PRO-NOR-SOP-07-B-00015355.0001001 / 18 NOV 21

ATC

ATC..SET FOR OPERATION | PM

L2 *ATC is set in accordance with airport requirements.*

Ident.: PRO-NOR-SOP-07-B-00011063.0002001 / 18 NOV 21

WINDOWS AND DOORS

WINDOWS and DOORS..CHECK CLOSED | PF-PM

L2
- *To ensure that the sliding window is correctly closed and locked, push the handle of the sliding window fully forward to the closed position, and verify that the red indicator is no longer visible*
- *Check, on the ECAM lower display, that all the aircraft doors are closed*
- *When required by local airworthiness authorities, check that the cockpit door is closed and locked (no cockpit door open/fault indication).*
  If entry is requested, identify the person requesting entry before unlocking the door. With the cockpit door selector on NORM, the cockpit door is closed and locked. If entry is requested from the cabin, and if no further action is performed by the pilot, the cabin crew will be able to unlock the door by using the emergency access procedure. Except for crew entry/exit, the cockpit door should remain closed until engine shutdown.

L1 *Note:* *Starting one engine with a door not closed will result in pack valve closure.*

SLIDES..CHECK ARMED | PF-PM

L2 *Check, on the ECAM lower display, that all slides are armed.*

Ident.: PRO-NOR-SOP-07-B-00011065.0001001 / 18 NOV 21

THRUST LEVERS

THRUST LEVERS ....IDLE | PF

CAUTION	*The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.*

Ident.: PRO-NOR-SOP-07-B-00017116.0001001 / 18 NOV 21

ACCU PRESSURE

ACCU PRESS indicator..CHECK | PF

L2 *The ACCU PRESS indication must be in the green band. If required, use the electric pump on blue hydraulic system to recharge the brake accumulator.*

L1 **WARNING** The blue electric pump pressurizes the blue hydraulic system. Get ground crew clearance before using the electric pump.

Ident.: PRO-NOR-SOP-07-B-00011066.0002001 / 18 NOV 21

PARKING BRAKE AND NOSEWHEEL STEERING

- **If pushback is not required:**

  PARK BRK handle ....ON | PF

  L2 *When one brake temperature is above 500 °C , avoid applying the parking brake, unless operationally necessary.*

  L1 BRAKES PRESS indicator...CHECK | PF

  L2 *Check for normal indications.*

  L1 BEFORE START C/L...COMPLETE | PF-PM

Ident.: PRO-NOR-SOP-07-B-00011062.0001001 / 03 NOV 23

- **If pushback is required:**

  N/WS DISC MEMO...CHECK DISPLAYED | PF

  L2 *In the case of pushback (towbarless or conventional), the nose wheel steering selector bypass pin must be in the tow position. The N/WS DISC memo on the ECAM indicates this position.*

  L1 ***CAUTION*** *If the ECAM does not display the N/WS DISC memo, but the ground crew confirms that the tow pin is in the towing position, do not start the engines during pushback in order to avoid possible damage to the nose landing gear upon green hydraulic pressurization.*
  To dispatch the aircraft in this case, Refer to MEL/MI-32-51 NWS Electrical Deactivation Box.

  BEFORE START C/L...COMPLETE | PF-PM
  PARK BRK handle ....OFF | PF

  CAUTION *Do not use brakes during pushback, unless required due to an emergency.*

- **When pushback is completed:**

  PARK BRK handle ....ON | PF

BRAKE PRESS indicator..CHECK | PF

L2 *Check for normal indications.*

Ask the ground crew for towbar disconnection.

AUTOMATIC ENGINE START

Ident.: PRO-NOR-SOP-08-00011042.0002001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

THRUST levers....................IDLE | PF

CAUTION	*The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.*

ENG START selector ....IGN START | PF

L2 *The lower ECAM displays the ENGINE SD page.*

L1 ENGINE 1 START....................ANNOUNCE | PF

L2 *Engine 1 is usually started first. It powers the blue hydraulic system, which pressurizes the parking brake.*

L1
- **At least 3 s after the ENG START selector is set to the IGN START position and when all amber crosses and messages have disappeared on the engine parameters (upper ECAM display):**
  ENG 1 MASTER lever....................ON | PF

  Note: Parameter callouts are not mandatory.

ON ECAM UPPER DISPLAY	ON ECAM LOWER DISPLAY
N2 increases	Corresponding start valve in line. Bleed pressure indication green. Oil pressure increases.
At 10 % N2:	Indication of the active igniter (A or B)
At 15 % N2: - FF increases 20 s (maximum) after fuel is on - EGT increases - N1 increases	
At 50 % N2:	Start valve starts closing. (It is fully closed after about 3 s or 4 s).
At 54 % N2:	Igniter indication off.

- **When idle is reached (AVAIL indication is displayed):**
  ENG IDLE PARAMETERS....................CHECK | PF

  At ISA sea level : N1 about 23 %
  N2 about 63 %
  EGT about 360 °C
  FF about 550 kg/h (1 210 lb/h)

ENGINE 2 START.........ANNOUNCE | PF
ENG 2 MASTER lever.........ON | PF

Apply the same procedure as indicated for engine 1.

AUTOMATIC ENGINE START

Ident.: PRO-NOR-SOP-08-00011042.0011001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

THRUST levers.........IDLE | PF

CAUTION	*The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, then thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.*

ENG START selector ....IGN START | PF

L2 *The lower ECAM displays the ENGINE SD page.*

L1 ENGINE 1 START.........ANNOUNCE | PF

L2 *Engine 1 is usually started first. It powers the blue hydraulic system, which pressurizes the parking brake.*

L1 ● **After all amber crosses and messages have disappeared on the engine parameters (upper ECAM display):**

ENG 1 MASTER lever.........ON | PF

Note:
- *Parameter callouts are not mandatory.*
- *When starting a hot engine (EGT above 100 °C, for the first automatic start and above 150 °C, for the second automatic start), the EEC controls a dry crank, in order to reduce engine temperature. The igniters and the fuel are controlled ON, once the EGT is below 100 °C (150 °C, in case of a second automatic start attempt).*

ON ECAM UPPER DISPLAY	ON ECAM LOWER DISPLAY
N3 increases	Corresponding start valve is in line. Bleed pressure indication is green. Oil pressure increases.
At 25 % N3: - FF increases 30 s (maximum) after fuel is on - EGT increases - N1 increases	Indication of the active igniter (A or B) .
At 50 % N3	Start valve starts closing. (It is fully closed after about 10 s.)

ENG IDLE PARAMETERS...CHECK PF

At ISA sea level : EPR about 1.015
N1 about 22.6 %
N2 about 47 %
N3 about 63 %
EGT about 380 °C,
FF about 820 kg/h (1 800 lb/h)

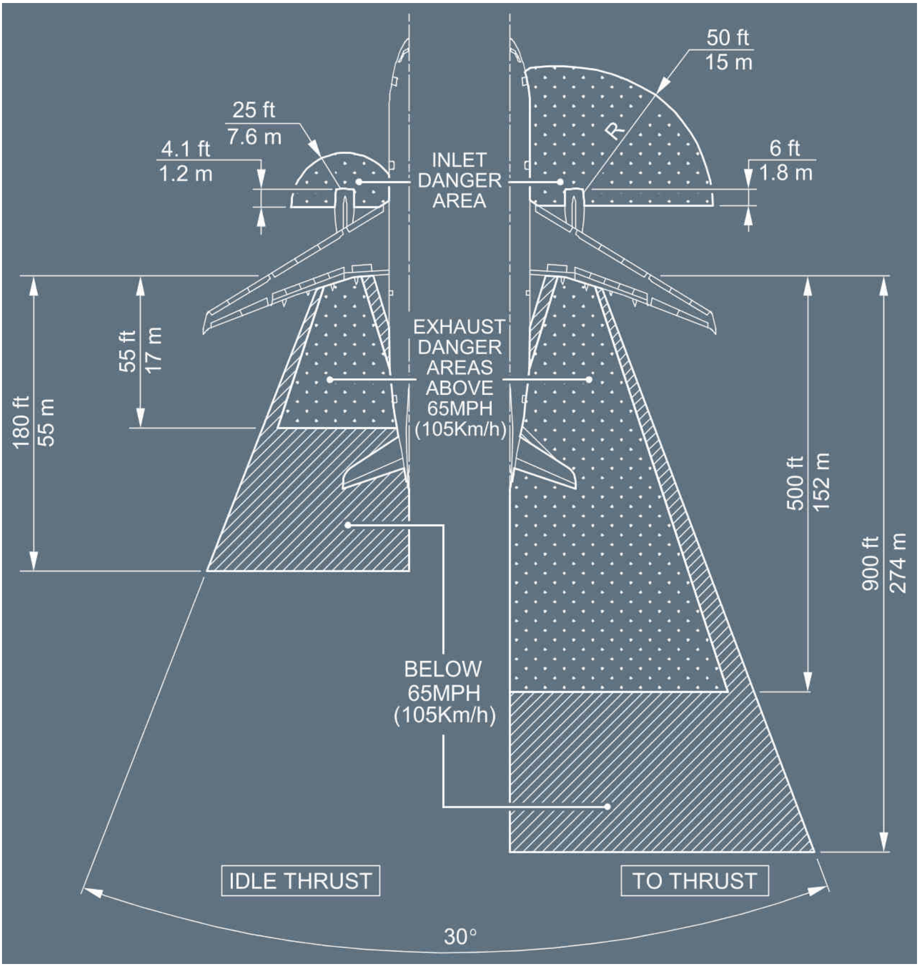
ENGINE 2 START..ANNOUNCE PF
ENG 2 MASTER lever..ON PF

Apply the same procedure as indicated for engine 1.

GROUND RUN UP-DANGER AREAS

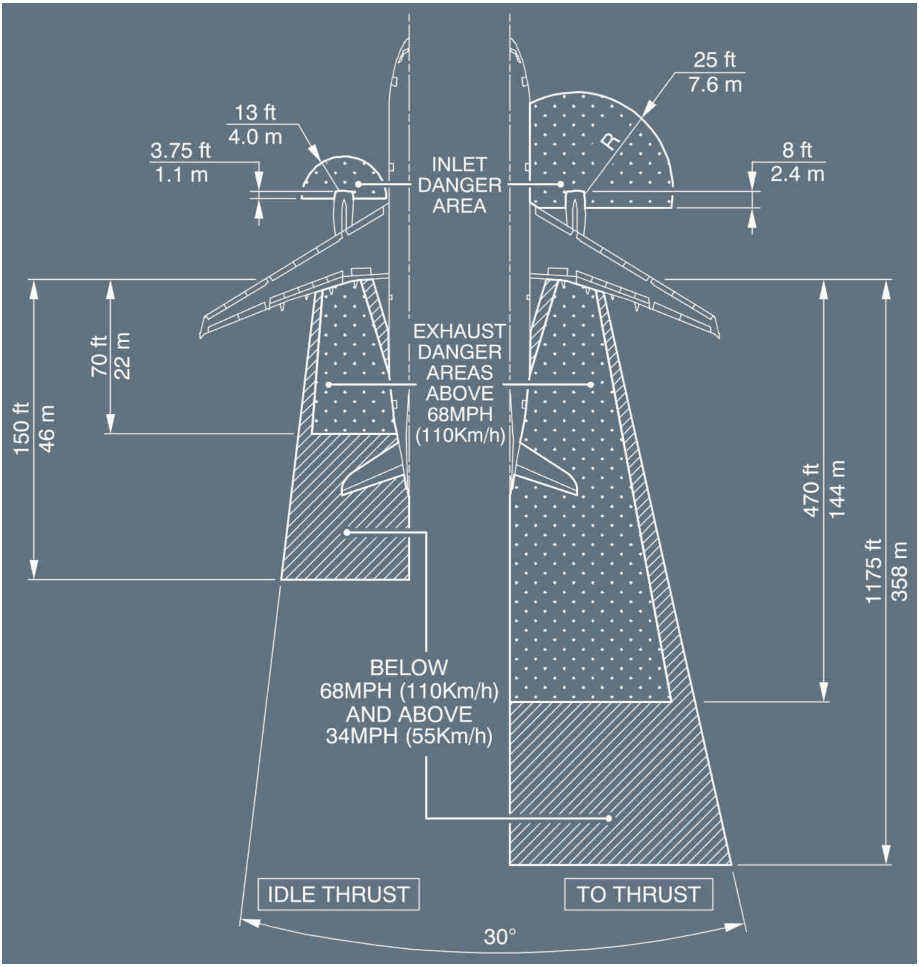
Ident.: PRO-NOR-SOP-08-00011069.0002001 / 06 JAN 16

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO


50 ft
15 m
25 ft
7.6 m
4.1 ft
1.2 m
R
6 ft
1.8 m
INLET DANGER AREA
EXHAUST DANGER AREAS ABOVE 65MPH (105Km/h)
55 ft
17 m
180 ft
55 m
500 ft
152 m
900 ft
274 m
BELOW 65MPH (105Km/h)
IDLE THRUST
TO THRUST
30°

GROUND RUN UP-DANGER AREAS

Ident.: PRO-NOR-SOP-08-00011069.0004001 / 03 APR 13
Applicable to: LV-KHT, LV-KHU


13 ft
4.0 m
3.75 ft
1.1 m
25 ft
7.6 m
R
8 ft
2.4 m
INLET
DANGER
AREA
EXHAUST
DANGER
AREAS
ABOVE
68MPH
(110Km/h)
70 ft
22 m
150 ft
46 m
470 ft
144 m
1175 ft
358 m
BELOW
68MPH (110Km/h)
AND ABOVE
34MPH (55Km/h)
IDLE THRUST
TO THRUST
30°

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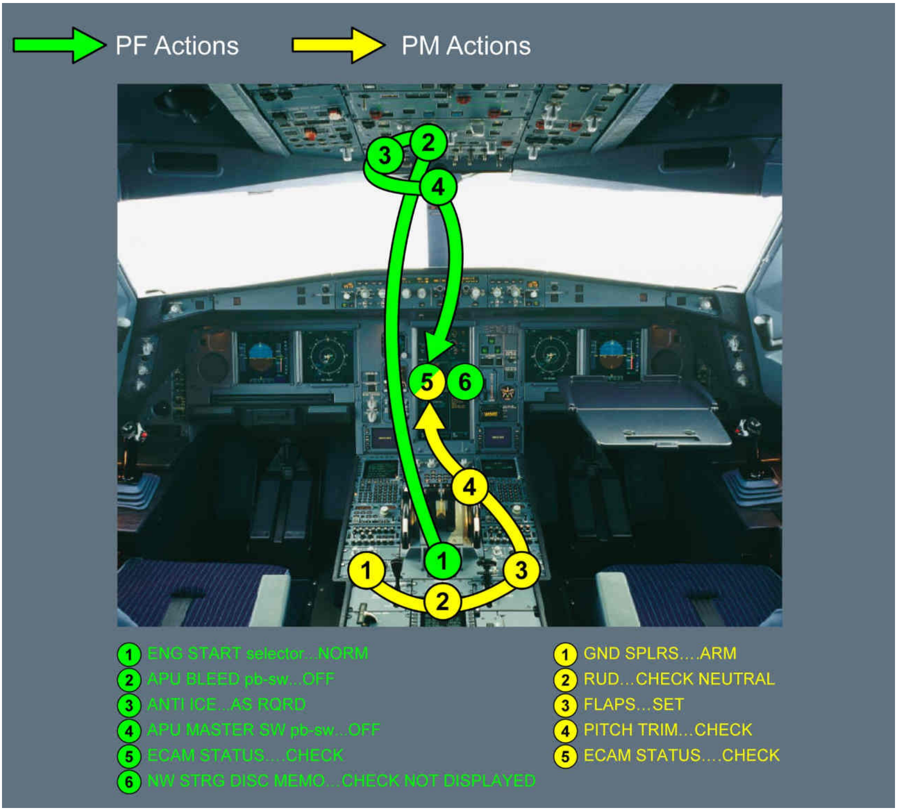
AFTER START

Ident.: PRO-NOR-SOP-09-A-00019960.0001001 / 03 NOV 22
Applicable to: ALL

AFTER START FLOW PATTERN

When the engines have started, the PF sets the ENG START selector to NORM to permit normal pack operation. At this time, the After Start Flow Pattern begins.



① ENG START selector...NORM
② APU BLEED pb-sw...OFF
③ ANTI ICE...AS RQRD
④ APU MASTER SW pb-sw...OFF
⑤ ECAM STATUS....CHECK
⑥ NW STRG DISC MEMO...CHECK NOT DISPLAYED

① GND SPLRS....ARM
② RUD...CHECK NEUTRAL
③ FLAPS...SET
④ PITCH TRIM...CHECK
⑤ ECAM STATUS....CHECK

Ident.: PRO-NOR-SOP-09-A-00011043.0002001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ENG START SELECTOR

ENG START selector .... NORM | PF

L2 *For additional information on the automatic starting sequence, Refer to DSC-70-80-30 Sequence of the Automatic Start.*

L1 After start, to avoid thermal shock, the engine should be operated at idle or near idle for at least 3 min prior to advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

Ident.: PRO-NOR-SOP-09-A-00011043.0004001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

ENG START SELECTOR

ENG START selector .... NORM | PF

L2 *For additional information on the automatic starting sequence, Refer to DSC-70-80-30 Sequence of the Automatic Start.*

L1 After start, to avoid thermal shock, the engine should be operated at idle, or near idle for at least:

- 5 min when engines are cold, or
- 3 min when engines are warm after a stop of 1.5 h or less

prior to advancing the thrust lever to high power. Taxi time at idle may be included in the warm-up period.

Ident.: PRO-NOR-SOP-09-A-00011044.0001001 / 09 NOV 21
Applicable to: ALL

APU BLEED

APU BLEED pb-sw...OFF | PF

L2 *This action enables to avoid ingestion of engine exhaust gases.*

Ident.: PRO-NOR-SOP-09-A-00011045.0002001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ANTI-ICE

CAUTION	In icing condition (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 and 2 ANTI-ICE pb-sw .... AS RQRD | PF

Engine anti-ice must be set to ON during all ground operations, when icing conditions exist or are anticipated.

Ident.: PRO-NOR-SOP-09-A-00011045.0003001 / 03 NOV 22
Applicable to: LV-KHT, LV-KHU

ANTI-ICE

CAUTION	In icing condition (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 and 2 ANTI-ICE pb-sw .... AS RQRD | PF

Engine anti-ice must be set to ON during all ground operations, when icing conditions exist or are anticipated.

Ident.: PRO-NOR-SOP-09-A-00011046.0001001 / 09 NOV 21
Applicable to: ALL

WING ANTI-ICE pb-sw.. AS RQRD | PF

On ground when wing anti-ice is switched on, the anti-ice valves open for about 30 s for self-test sequence, then close as long as the aircraft is on ground.

Ident.: PRO-NOR-SOP-09-A-00011047.0001001 / 09 NOV 21
Applicable to: ALL

APU

- **If the APU is not required:**
  APU MASTER SW pb-sw...OFF | PF

Ident.: PRO-NOR-SOP-09-A-00011052.0001001 / 09 NOV 21
Applicable to: ALL

NWS TOWING FAULT LIGHT

NWS TOWING FAULT LIGHT ◁✱ ....CHECK OFF | PF

Ident.: PRO-NOR-SOP-09-A-00011048.0001001 / 09 NOV 21
Applicable to: ALL

GROUND SPOILERS

GND SPLRS.. ARM | PM

Ident.: PRO-NOR-SOP-09-A-00011049.0001001 / 19 APR 22
Applicable to: ALL

RUDDER TRIM

RUD TRIM RESET pb	PRESS	PM

L2 *Press the RESET pb on the RUD TRIM panel.*

L1 RUD TRIM	CHECK NEUTRAL	PM

Note: *After the reset, the flight crew may observe an indication of up to 0.6 ° (L or R) in the RUD TRIM position indication.*

Ident.: PRO-NOR-SOP-09-A-00011050.0001001 / 09 NOV 21
Applicable to: ALL

FLAPS

FLAPS lever	SET FOR TAKEOFF	PM
FLAPS	CHECK POSITION	PM

L2 *Check the position of the flaps on the ECAM upper display.*

L1

- **If taxiing in icing conditions with rain, slush or snow:**
  Maintain the flaps retracted until the aircraft reaches the holding point of the takeoff runway.
  This action prevents contamination of the slats/flaps mechanism.

Ident.: PRO-NOR-SOP-09-A-00011051.0001001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

PITCH TRIM

PITCH TRIM	SET	PM

L2 *Set takeoff CG on the PITCH TRIM handwheel. For this purpose use the ECAM's CG indication.*

Ident.: PRO-NOR-SOP-09-A-00011051.0003001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

PITCH TRIM

PITCH TRIM	CHECK	PM

L2 *Check the takeoff CG on the PITCH TRIM handwheel using the ECAM's CG indication.*

Ident.: PRO-NOR-SOP-09-A-00011054.0001001 / 24 NOV 23
Applicable to: ALL

ECAM STATUS

ECAM STATUS	CHECK	PF-PM

L2 *The PM checks and the PF crosschecks that there is no status reminder (STS) on the E/WD*
If STS appears on the E/WD, press the STS pb to display the STATUS page.

Ident.: PRO-NOR-SOP-09-A-00015237.0001001 / 09 NOV 21
Applicable to: ALL

N/W STEER DISC MEMO

N/WS DISC MEMO..CHECK NOT DISPLAYED | PF

Ident.: PRO-NOR-SOP-09-A-00011055.0001001 / 09 NOV 21
Applicable to: ALL

GROUND CREW

CLEAR TO DISCONNECT...ANNOUNCE | PF

L2 *The ground crew:*

- *Removes the chocks*
- *Nose wheel steering towing light ◁ on the nose landing gear checked off.*
- *Disconnects the interphone*
- *Makes the hand signal on the left or right side.*

Ident.: PRO-NOR-SOP-09-A-00011068.0001001 / 09 NOV 21
Applicable to: ALL

AFTER START CHECKLIST

AFTER START C/L..COMPLETE | PF-PM

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TAXI

Ident.: PRO-NOR-SOP-10-A-00011941.0001001 / 09 NOV 21
Applicable to: ALL

TAXI CLEARANCE

TAXI clearance	OBTAIN	PM

Ident.: PRO-NOR-SOP-10-A-00011942.0001001 / 09 NOV 21
Applicable to: ALL

EXTERIOR LIGHTS

L2 During taxi, the PF may request the PM to set the exterior lights.

L1 NOSE sw	TAXI	PF
● **When crossing a runway:** STROBE sw	ON	PF
RWY TURN OFF & CAMERA sw	ON	PF

Ident.: PRO-NOR-SOP-10-A-00011943.0001001 / 09 NOV 21
Applicable to: ALL

PARK BRK

PARK BRK handle	OFF	PF
BRAKES PRESSURE	CHECK AT ZERO	PF

L2 *The flight crew may observe slight residual pressure on the triple indicator for a short period of time.*

Ident.: PRO-NOR-SOP-10-A-00011946.0002001 / 09 NOV 21
Applicable to: ALL

BRAKES

CAUTION	If the aircraft was parked in wet conditions for a long time, the first brake application at low speed is less effective.

BRAKE PEDALS	PRESS	PF
BRAKES	CHECK	PF
BRAKE FAN pb	AS RQRD	PM

L2 *If an arc is displayed above the brake temperature on the WHEEL SD page, set to ON the BRAKE FAN pb.*

L1 BRAKES PRESSURE	CHECK AT ZERO	PM

Ident.: PRO-NOR-SOP-10-A-00011948.0001001 / 09 NOV 21
Applicable to: ALL

FLIGHT CONTROLS

FLIGHT CONTROLS	CHECK	PF-PM

L2 *Check the flight controls at a convenient stage, before or during taxi.*

Ident.: PRO-NOR-SOP-10-A-00011949.0001001 / 09 NOV 21
Applicable to: ALL

ATC CLEARANCE

ATC clearance	CONFIRM	PM

Ident.: PRO-NOR-SOP-10-A-00015138.0001001 / 24 NOV 23
Applicable to: ALL

AFS/FLIGHT INSTRUMENTS

F-PLN (SID,TRANS) .... CHECK | PM

L2 *Carefully confirm that the ATC clearance agrees with the FMGS, if NAV mode is to be used.*

L1 INITIAL CLIMB SPEED AND SPEED LIMIT .... CHECK | PM

L2 *Use VERT REV at departure or at a CLB waypoint.*

L1 CLEARED ALTITUDE ON FCU .... SET | PM

L2 *On the PFD, crosscheck and confirm the first cleared altitude.*

L1 HDG ON FCU .... IF REQUIRED, PRESET | PM

L2 *If a heading is required by ATC after takeoff, in the case of a radar vector departure, preset the heading on the FCU. NAV mode will be disarmed.*
RWY TRK mode will keep the aircraft on the runway track.

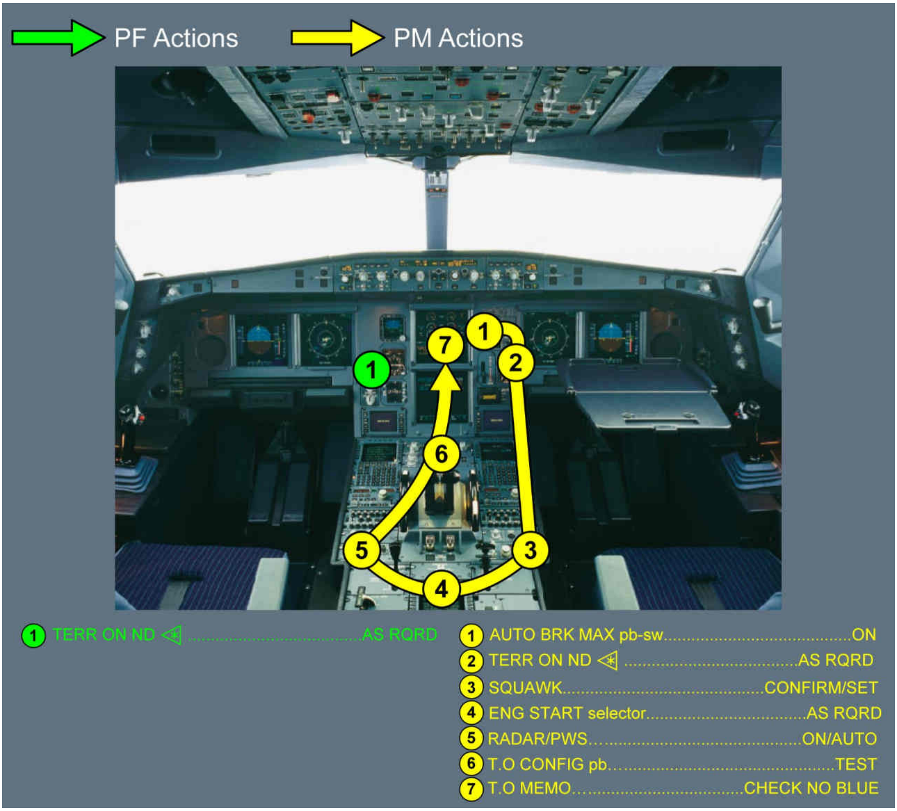
L1 BOTH FD .... CHECK ON | PM
PFD/ND .... CHECK | PF-PM

L2 *Check that the PFD (e.g. airspeeds, initial target altitude, heading, FMA modes) and the ND indications (SID) are in accordance with the departure.*

L1 DEPARTURE BRIEFING .... CONFIRM | BOTH

Ident.: PRO-NOR-SOP-10-A-00019948.0001001 / 24 NOV 23
Applicable to: ALL

TAXI FLOW PATTERN



PF:

① TERR ON ND ◁ ....AS RQRD

PM:

① AUTO BRK MAX pb-sw..ON
② TERR ON ND ◁ ....AS RQRD
③ SQUAWK..CONFIRM/SET
④ ENG START selector..AS RQRD
⑤ RADAR/PWS..ON/AUTO
⑥ T.O CONFIG pb..TEST
⑦ T.O MEMO..CHECK NO BLUE

Ident.: PRO-NOR-SOP-10-A-00011954.0001001 / 09 NOV 21
Applicable to: ALL

AUTO BRK

AUTO BRK MAX pb-sw..ON | PM

Ident.: PRO-NOR-SOP-10-A-00011953.0001001 / 09 NOV 21
Applicable to: ALL

TERR ON ND

TERR ON ND ◁ ....AS RQRD | PF-PM

Consider selecting the radar display on the PF side, and TERR ON ND on the PM side only.

Ident.: PRO-NOR-SOP-10-A-00011952.0001001 / 28 NOV 23
Applicable to: ALL

ATC

ATC CODE/MODE........................ CONFIRM/SET FOR TAKEOFF | PM

Ident.: PRO-NOR-SOP-10-A-00012083.0001001 / 15 NOV 21
Applicable to: LV-GKO, LV-GKP

ENG START SELECTOR

ENG START selector..AS RQRD | PM

L2 *Select IGN/START if:*
- *The runway has standing water*
- *Heavy rain is falling*
- *Heavy rain or severe turbulence is expected after takeoff.*

Ident.: PRO-NOR-SOP-10-A-00012083.0002001 / 15 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

ENG START SELECTOR

ENG START selector..AS RQRD | PM

L2 *Select IGN/START if:*
- *Heavy rain, or*
- *Moderate turbulence, or*
- *Severe turbulence is expected after takeoff.*

Ident.: TDU / PRO-NOR-SOP-10-A-00015144.0004001 / 03 NOV 22
Applicable to: LV-GKP
Impacted DU: 00015141 Taxi - Radar

WEATHER RADAR

RADAR..ON | PM

L2 *To check the departure path, set the MULTISCAN toggle switch to MAN. The flight crew can then set the radar to the AUTO position.*
Gain must be manually set to +4, when MULTISCAN selector is set to AUTO and when flying below FL 200.

L1 *Note:* *1. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique.*
2. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to MAN mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display.
3. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and MAN modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

PREDICTIVE WINDSHEAR SYSTEM..........AUTO | PM

Ident.: PRO-NOR-SOP-10-A-00015141.0002001 / 03 NOV 22
Applicable to: LV-KHT, LV-KHU

WEATHER RADAR

RADAR..........ON | PM

L2 *To check the departure path, set the TILT sw to MAN. The flight crew can then set the radar to the AUTO position.*

L1 PREDICTIVE WINDSHEAR SYSTEM ◁ ....AUTO | PM

Ident.: PRO-NOR-SOP-10-A-00015141.0003001 / 03 NOV 22
Applicable to: LV-GKP
Impacted by TDU: 00015144 Taxi - Radar

~~WEATHER RADAR~~

~~RADAR..........ON | PM~~

~~L2 *To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.*~~

~~L1 PREDICTIVE WINDSHEAR SYSTEM..........AUTO | PM~~

Ident.: PRO-NOR-SOP-10-A-00015141.0003001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO

WEATHER RADAR

RADAR..........ON | PM

L2 *To check the departure path, set the MULTISCAN sw to MAN. The flight crew can then set the radar to the AUTO position.*

L1 PREDICTIVE WINDSHEAR SYSTEM..........AUTO | PM

Ident.: PRO-NOR-SOP-10-A-00011956.0001001 / 09 NOV 21
Applicable to: ALL

FINAL CHECK

T.O CONFIG pb .... TEST | PM

L2 *Press the T.O CONFIG on the ECP, and check that the EWD displays the T.O CONFIG NORMAL memo.*

L1 T.O MEMO .... CHECK NO BLUE | PM

L2 *Check that the EWD does not display any blue line in the T.O memo section.*

L1 CABIN REPORT .... RECEIVE | PF-PM

L2 *Check CABIN READY ◁ in the EWD, or obtain the cabin report from the purser.*

Ident.: PRO-NOR-SOP-10-A-00024929.0001001 / 09 NOV 21
Applicable to: ALL

TAXI CHECKLIST

TAXI C/L.. COMPLETE | PF-PM

DEPARTURE CHANGE

Ident.: PRO-NOR-SOP-10B-00011950.0001001 / 15 NOV 21
Applicable to: ALL

DEPARTURE CHANGE

FINAL TAKEOFF PERF DATA....................RECOMPUTE | PF-PM

L2 *The PF and the PM independently compute again the takeoff performance data.*

L1 FMS TAKEOFF DATA....................REVISE | PM

L2 *The PM revises the takeoff data in the FMS.*
If the flight crew uses the optimum configuration option for the computation, they should pay specific attention to changes to the configuration of the slats/flaps at takeoff.

L1 FMS REVISED TAKEOFF PERF DATA....................CROSSCHECK | PF

L2 *The PF crosschecks the performance data displayed on the PF's EFB with the FMS PERF T.O page.*

L1 EFB/MCDU GREEN DOT....................COMPARE | PF

L2 *The PF compares Green Dot speed computed by the FMGES and the Green Dot speed computed using the TAKEOFF application. A discrepancy indicates a difference in the TOW used in both systems (EFB/FMGES).*

L1 FLAPS lever ....AS APPROPRIATE | PM

L2 *Select takeoff position.*

L1 F-PLN (SID,TRANS)....................CHECK | PM

L2 *Carefully confirm that the ATC clearance agrees with the FMGES, if NAV mode is to be used.*

L1 INITIAL CLIMB SPEED AND SPEED LIMIT....................CHECK | PM

L2 *Use VERT REV at departure at a CLB waypoint.*

L1 RE-BRIEFING....................COMPLETE | BOTH
DEPARTURE CHANGE C/L....................COMPLETE | PF-PM

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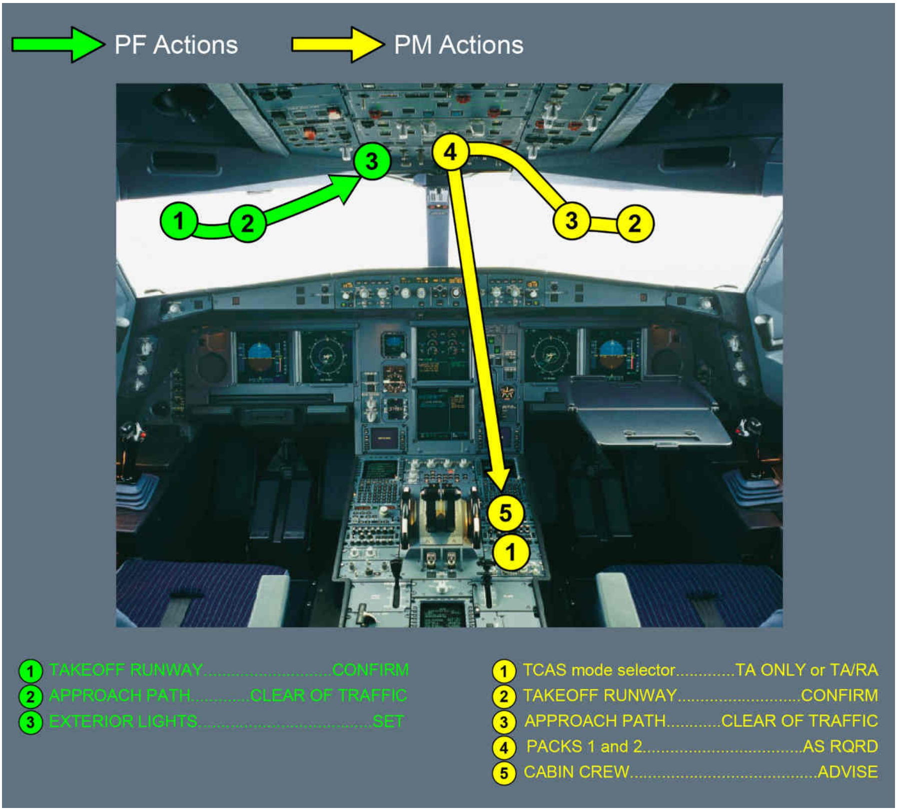
BEFORE TAKEOFF

Ident.: PRO-NOR-SOP-11-A-00025077.0001001 / 09 NOV 21
Applicable to: ALL

LINE-UP FLOW PATTERN



① TAKEOFF RUNWAY............................CONFIRM
② APPROACH PATH............CLEAR OF TRAFFIC
③ EXTERIOR LIGHTS......................................SET

① TCAS mode selector.............TA ONLY or TA/RA
② TAKEOFF RUNWAY............................CONFIRM
③ APPROACH PATH............CLEAR OF TRAFFIC
④ PACKS 1 and 2...................................AS RQRD
⑤ CABIN CREW...ADVISE

Ident.: PRO-NOR-SOP-11-A-00012082.0001001 / 09 NOV 21
Applicable to: ALL

BRAKE FANS

- **If the brake fans are set to ON:**

  BRAKE TEMPERATURE..CHECK | PM

- **If the temperature of one brake is at or more than 150 °C:**

  TAKEOFF...DELAY | PM

  L2 *This prevents the display of the BRAKES HOT alert when the BRAKE FAN is set to OFF.*

L1

- **If the temperature of all brakes is below 150 °C:**

  BRAKE FAN pb...OFF | PM

Ident.: PRO-NOR-SOP-11-A-00012067.0001001 / 09 NOV 21
Applicable to: ALL

LINE-UP CLEARANCE

LINE-UP CLEARANCE...OBTAIN | PM

Ident.: PRO-NOR-SOP-11-A-00012069.0001001 / 24 NOV 23
Applicable to: ALL

TCAS

TCAS Mode selector..TA or TA/RA | PM

L2 *The flight crew should use the TA/RA mode as the default mode of the TCAS.*
The flight crew may use the TA ONLY mode in specific airports, and for specific procedures (identified by operators) that may provide resolution advisories that are neither wanted nor appropriate (e.g. closely-spaced parallel or converging runways).

Ident.: PRO-NOR-SOP-11-A-00012077.0001001 / 09 NOV 21
Applicable to: ALL

TAKEOFF RUNWAY

TAKEOFF RUNWAY...CONFIRM | PF-PM

L2 *Confirm that the line up is performed on the intended runway and from the intended intersection.*
Useful aids are:

- *The runway markings*
- *The runway lights*
  Be careful that in low visibility, edge lights could be mixed up with the center line lights.
- *The ILS signal*
  If the runway is ILS equipped, the flight crew can press the ILS pb (or LS pb): the LOC deviation should be centered after line up
- *The runway symbol on the ND*
- *The Runway Awareness and Advisory System* ◁ .

Ident.: PRO-NOR-SOP-11-A-00012070.0001001 / 09 NOV 21
Applicable to: ALL

APPROACH PATH CLEAR OF TRAFFIC

APPROACH PATH...CLEAR OF TRAFFIC | PF-PM

L2 *Check that the approach path is clear of traffic, visually and using TCAS display on ND.*

Ident.: PRO-NOR-SOP-11-A-00021962.0001001 / 09 NOV 21
Applicable to: ALL

EXTERIOR LIGHTS

STROBE sw... ON | PF

L2 *Set the STROBE sw to ON to cross or enter a runway.*
The PF can request the PM to set the exterior lights.

Ident.: PRO-NOR-SOP-11-A-00012073.0001001 / 09 NOV 21
Applicable to: ALL

PACKS

PACK 1 pb-sw and PACK 2 pb-sw...AS RQRD | PM

L2 *Consider setting the packs to OFF, or the APU bleed pb-sw to ON. This will improve performance, when using TOGA thrust.*
If a takeoff is performed with the packs OFF : The packs must be set to OFF at least 20 s before applying takeoff thrust.
In the case of a FLEX takeoff, setting the packs to OFF, or the APU bleed pb-sw ON, will reduce takeoff EGT, and consequently reduce maintenance costs.
Use of the APU bleed is not permitted, if wing anti-ice is to be used.
Set the APU bleed pb-sw to ON at least 20 s before applying takeoff thrust. This will prevent the ENG THRUST LOSS alert from triggering due to incorrect valve position.

Ident.: PRO-NOR-SOP-11-A-00012081.0001001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

RNP AR DEPARTURE

GPS 1+2 on GPS MONITOR page... CHECK BOTH IN NAV | PM
GPS PRIMARY on PROG page...CHECK AVAILABLE | PM
FMA.. CHECK | PF-PM

L2 *Verify NAV is armed.*

Ident.: PRO-NOR-SOP-11-A-00012079.0001001 / 09 NOV 21
Applicable to: ALL

SLIDING TABLE/EFB

SLIDING TABLE.. STOW | PF-PM

ALL EFB transmitting mode........................ AS RQRD | PF-PM

L2 *In accordance with the Operator's policy or, as required by operational regulations.*

L1 ALL EFB (with no mounted equipment)........................ STOW | PF-PM

L2 *In flight, both flight crewmembers should not use EFB applications at the same time.*

Ident.: PRO-NOR-SOP-11-A-00012087.0002001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

THRUST BUMP

THRUST BUMP guarded pb........................ AS RQRD | PF

L2
- *If performance requires, additional thrust capability may be selected for takeoff.*
- *Releasing one of the two thrust bump pb engages the thrust bump (check that a green “B” symbol appears on the right side of each engine N1 indication).*
  Use of the bump rating must be recorded in the logbook for tracking by maintenance personnel.

Ident.: PRO-NOR-SOP-11-A-00012088.0001001 / 09 NOV 21
Applicable to: ALL

CABIN CREW

CABIN CREW........................ ADVISE | PM

L2 *Advise the cabin crew that takeoff is imminent.*

Ident.: PRO-NOR-SOP-11-A-00012090.0001001 / 15 NOV 21
Applicable to: ALL

LINE-UP CHECKLIST

LINE-UP C/L........................ COMPLETE | PF-PM

TAKEOFF

Ident.: PRO-NOR-SOP-12-A-00021964.0001001 / 09 NOV 21
Applicable to: ALL

TAKEOFF CLEARANCE

TAKEOFF CLEARANCE	OBTAIN	PM

Ident.: PRO-NOR-SOP-12-A-00021963.0001001 / 09 NOV 21
Applicable to: ALL

EXTERIOR LIGHTS

NOSE sw	T.O	PF
RWY TURN OFF sw	ON	PF
LAND sw	ON	PF

Ident.: PRO-NOR-SOP-12-A-00012071.0004001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

THRUST SETTING

The below procedure is the standard takeoff procedure. However, rolling takeoff is permitted.

TAKEOFF	ANNOUNCE	PF
THRUST	50 % N1 (1.05 EPR)	PF

- **If the crosswind is at or below 20 kt and there is no tailwind:**

SIDESTICK	HALF FORWARD	PF

L2 *To counter the nose-up effect of setting engine takeoff thrust, apply half forward sidestick until the airspeed reaches 80 kt. Release the sidestick gradually to reach neutral at 100 kt.*

L1

BRAKES	RELEASE	PF
THRUST LEVERS	FLX or TOGA	PF

L2 *Once the thrust levers are set to FLX or TOGA detent, the Captain maintains the hand on the thrust levers until the aircraft reaches V1.*

L1

- **In case of tailwind, or if crosswind is greater than 20 kt:**

SIDESTICK	FULL FORWARD	PF

L2 *To counter the nose-up effect of setting engine takeoff thrust, apply full forward sidestick until the airspeed reaches 80 kt. Release the sidestick gradually to reach neutral at 100 kt.*

L1

BRAKES	RELEASE	PF

THRUST LEVERS .... FLX or TOGA | PF

L2
- *Increase thrust rapidly to about 70 % N1 (1.15 EPR), then progressively to reach takeoff thrust by 40 kt ground speed*
- *Once the thrust levers are set to FLX or TOGA detent, the Captain maintains the hand on the thrust levers, until the aircraft reaches V1.*

L1 *Note: The ENG SD page replaces the WHEEL SD page on the lower ECAM display.*

CHRONO.. START | PM
DIRECTIONAL CONTROL.. USE RUDDER | PF
PFD/ND.. MONITOR | PM

L2 *If GPS PRIMARY LOST, check on the ND the FMS position: i.e. that the aircraft is on the runway centerline.*

Ident.: PRO-NOR-SOP-12-A-00012071.0016001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

THRUST SETTING

The below procedure is the standard takeoff procedure. However, rolling takeoff is permitted.

TAKEOFF.. ANNOUNCE | PF
THRUST.. 1.1 EPR | PF

- **If the crosswind is at or below 20 kt and there is no tailwind:**

SIDESTICK.. HALF FORWARD | PF

L2 *To counter the nose-up effect of setting engine takeoff thrust, apply half forward sidestick until the airspeed reaches 80 kt. Release the sidestick gradually to reach neutral at 100 kt.*

L1
BRAKES.. RELEASE | PF
THRUST LEVERS.. FLX or TOGA | PF

L2 *Once the thrust levers are set to FLX or TOGA detent, the Captain maintains the hand on the thrust levers, until the aircraft reaches V1.*

L1
- **In case of tailwind, or if crosswind is greater than 20 kt:**

SIDESTICK.. FULL FORWARD | PF

L2 *To counter the nose-up effect of setting engine takeoff thrust, apply full forward sidestick until the airspeed reaches 80 kt. Release the sidestick gradually to reach neutral at 100 kt.*

L1
BRAKES.. RELEASE | PF
THRUST LEVERS.. FLX or TOGA | PF

L2 *Once the thrust levers are set to FLX or TOGA detent, the Captain maintains the hand on the thrust levers, until the aircraft reaches V1.*

L1 *Note: The ENG SD page replaces the WHEEL SD page on the lower ECAM display.*

CHRONO	START	PM
DIRECTIONAL CONTROL	USE RUDDER	PF
PFD/ND	MONITOR	PM

L2 *If GPS PRIMARY LOST, check on the ND the FMS position: i.e. that the aircraft is on the runway centerline.*

Ident.: PRO-NOR-SOP-12-A-00012072.0001001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

BELOW 80 KT

TAKEOFF THRUST	CHECK	PM

L2 *Check that the actual N1/EPR of the individual engines has reached the N1/EPR rating limit, before the aircraft reaches 80 kt. Check EGT.*

L1

THRUST SET	ANNOUNCE	PM
PFD and ENG indications	MONITOR	PM

L2 *Scan airspeed, N1/EPR, and EGT throughout the takeoff.*

Ident.: PRO-NOR-SOP-12-A-00012072.0005001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

BELOW 80 KT

TAKEOFF THRUST	CHECK	PM

L2 *Check that the actual N1/EPR of the individual engines has reached the N1/EPR rating limit, before the aircraft reaches 80 kt. Check EGT.*

L1

B on ECAM (if thrust bump is used)	CHECK	PM
THRUST SET	ANNOUNCE	PM
PFD and ENG indications	MONITOR	PM

L2 *Scan airspeed, N1/EPR, and EGT throughout the takeoff.*

Ident.: PRO-NOR-SOP-12-A-00025004.0001001 / 09 NOV 21
Applicable to: ALL

AT 80 KT

SIDESTICK	RELEASE	PF

L2 *Release the sidestick gradually to reach neutral at 100 kt.*

Ident.: PRO-NOR-SOP-12-A-00012074.0001001 / 09 NOV 21
Applicable to: ALL

AT 100 KT

ONE HUNDRED KNOTS	ANNOUNCE	PM
100 KT	CROSSCHECK	PF

L2
- *The PF crosschecks and confirms the speed indicated on the PFD*
- *Below 100 kt, the Captain may decide to abort the takeoff, depending on the circumstances*
- *Above 100 kt, rejecting the takeoff is a more serious matter.*

Ident.: PRO-NOR-SOP-12-A-00012076.0002001 / 09 NOV 21
Applicable to: ALL

AT V1

V1	MONITOR OR ANNOUNCE	PM

L2 *Monitor that the “V1” synthetic voice is triggered when reaching V1. If not, announce “V1”.*

Ident.: PRO-NOR-SOP-12-A-00012078.0001001 / 09 NOV 21
Applicable to: ALL

AT VR

ROTATION	ORDER	PM
ROTATION	PERFORM	PF

L2
- *At VR, initiate the rotation with a positive sidestick input to achieve a continuous rotation rate of about 3 °/s, towards a pitch attitude of 15 ° (12.5 °, if one engine is failed)*
- *Minimize lateral inputs on ground and during the rotation, to avoid spoiler extension. In strong crosswind conditions, small lateral stick inputs may be used, if necessary, to aim at maintaining wings level.*
- *After lift-off, follow the SRS pitch command bar.*

L1

CAUTION	If a tailstrike occurs, avoid flying at an altitude requiring a pressurized cabin, and return to the originating airport for damage assessment.

Ident.: PRO-NOR-SOP-12-A-00012080.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

WHEN POSITIVE CLIMB

POSITIVE CLIMB	ANNOUNCE	PM

L2 *Announce positive climb, when the vertical speed indication is positive and radio altitude has increased.*

L1

L/G UP	ORDER	PF
L/G lever	SELECT UP	PM

	AP	AS RQRD	PF

L2 *Above 100 ft AGL, AP 1 or AP 2 may be engaged.*

Ident.: PRO-NOR-SOP-12-A-00012080.0003001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO

WHEN POSITIVE CLIMB

	POSITIVE CLIMB	ANNOUNCE	PM

L2 *Announce positive climb, when the vertical speed indication is positive and radio altitude has increased.*

L1	L/G UP	ORDER	PF
	L/G lever	SELECT UP	PM
	AP	AS RQRD	PF

L2 *Above 100 ft AGL, AP 1 or AP 2 may be engaged.*
The AP must be engaged for RNP AR < 0.3 NM.

Ident.: PRO-NOR-SOP-12-A-00012084.0001001 / 09 NOV 21
Applicable to: ALL

AT THRUST REDUCTION ALTITUDE

	THRUST LEVERS	CL	PF

L2 *Move the thrust levers to the CL detent, when the flashing LVR CLB prompt appears on the FMA.*
Autothrust is now active.

L1	PACK 1 and PACK 2 (if applicable)	ON	PM

L2
- *Select PACK 1 on, after CLB thrust reduction*
- *Select PACK 2 on, at least 10 s after PACK 1 is selected on, for passenger comfort.*

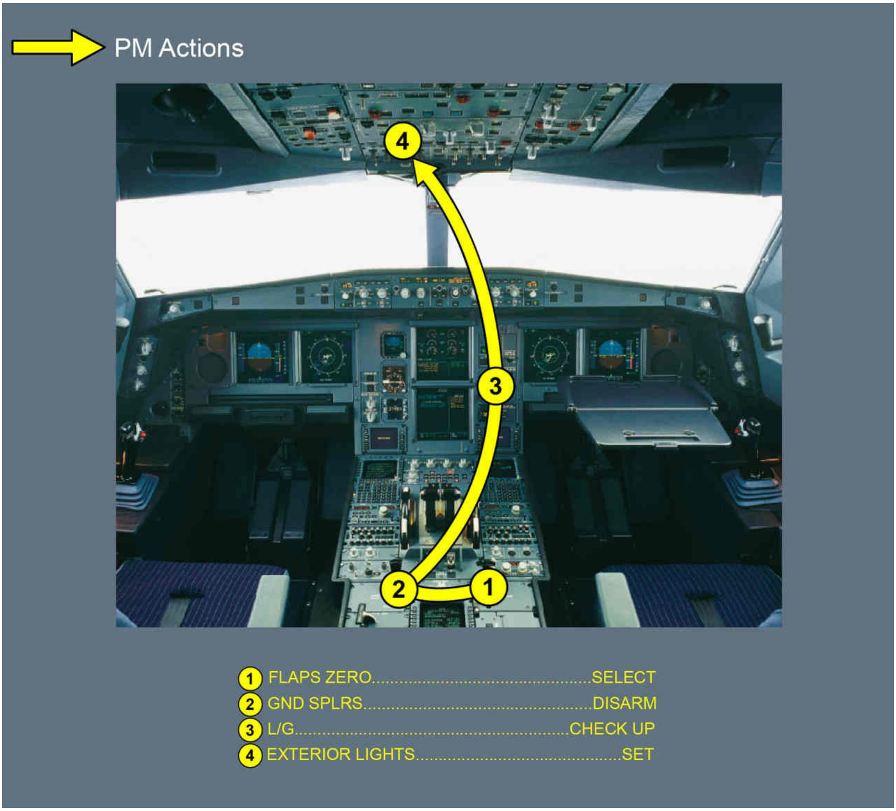
L1 *Note:* *1. Selecting the packs on, before reducing the takeoff thrust, will result in an EGT increase*
2. If packs are not switched on after the takeoff phase, an ECAM caution will be triggered.

Ident.: PRO-NOR-SOP-12-A-00012091.0001001 / 09 NOV 21
Applicable to: ALL

ABOVE ACCELERATION ALTITUDE (OR ONCE IN CLIMB PHASE)

L2 The following procedure ensures that the aircraft is correctly accelerating toward climb speed.

L1 ACCELERATION FLOW PATTERN



PM Actions

① FLAPS ZERO....................SELECT
② GND SPLRS....................DISARM
③ L/G....................CHECK UP
④ EXTERIOR LIGHTS....................SET

- **At F speed**

FLAPS 1	ORDER	PF
FLAPS 1	SELECT	PM

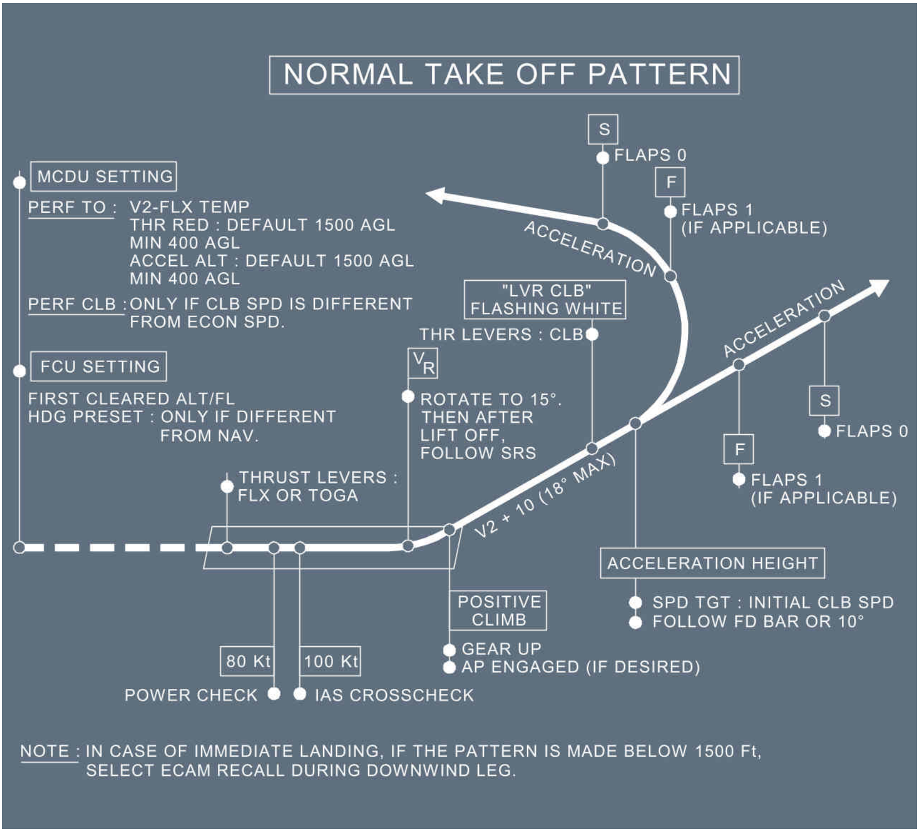
- **At S speed**

FLAPS 0	ORDER	PF
FLAPS 0	SELECT	PM
GND SPLRS	DISARM	PM
L/G	CHECK UP	PM
NOSE sw	OFF	PM
RWY TURN OFF sw	OFF	PM

OTHER EXTERIOR LIGHTS..AS RQRD | PM

L2 *The flight crew can maintain the LAND sw set to ON, according to airline policy or regulatory recommendations.*

Ident.: PRO-NOR-SOP-12-A-00012092.0001001 / 18 AUG 10
Applicable to: ALL


NORMAL TAKE OFF PATTERN
MCDU SETTING
PERF TO : V2-FLX TEMP
THR RED : DEFAULT 1500 AGL
MIN 400 AGL
ACCEL ALT : DEFAULT 1500 AGL
MIN 400 AGL
PERF CLB : ONLY IF CLB SPD IS DIFFERENT FROM ECON SPD.
FCU SETTING
FIRST CLEARED ALT/FL
HDG PRESET : ONLY IF DIFFERENT FROM NAV.
THRUST LEVERS : FLX OR TOGA
VR
ROTATE TO 15°. THEN AFTER LIFT OFF, FOLLOW SRS
"LVR CLB" FLASHING WHITE
THR LEVERS : CLB
S
FLAPS 0
F
FLAPS 1 (IF APPLICABLE)
ACCELERATION
ACCELERATION
V2 + 10 (18° MAX)
S
FLAPS 0
F
FLAPS 1 (IF APPLICABLE)
ACCELERATION HEIGHT
SPD TGT : INITIAL CLB SPD
FOLLOW FD BAR OR 10°
POSITIVE CLIMB
GEAR UP
AP ENGAGED (IF DESIRED)
80 Kt
100 Kt
POWER CHECK
IAS CROSSCHECK

NOTE : IN CASE OF IMMEDIATE LANDING, IF THE PATTERN IS MADE BELOW 1500 Ft, SELECT ECAM RECALL DURING DOWNWIND LEG.

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AFTER TAKEOFF

Applicable to: ALL

Ident.: PRO-NOR-SOP-13-A-00010470.0001001 / 09 NOV 21

APU

- **If the APU was used to supply the air conditioning during takeoff:**

  APU BLEED pb-sw..OFF | PM

  APU MASTER SW pb-sw..OFF | PM

Ident.: PRO-NOR-SOP-13-A-00010471.0001001 / 09 NOV 21

ENG START SELECTOR

ENG START selector ....AS RQRD | PM

L2 *Select IGN/START, if severe turbulence or heavy rain is encountered.*

Ident.: PRO-NOR-SOP-13-A-00010472.0001001 / 09 NOV 21

TCAS

- **If the takeoff was performed with TA only:**

  TCAS mode selector.. TA/RA | PM

Ident.: PRO-NOR-SOP-13-A-00010560.0001001 / 18 NOV 21

ANTI ICE

ENG ANTI-ICE pb-sw ....AS RQRD | PM

L2 *Engine anti-ice must be set to ON when icing conditions (Refer to LIM-ICE_RAIN Definition of Icing Conditions) exist or are anticipated, except during climb and cruise when the SAT is below -40 °C (-40 °F).*

L1 WING ANTI-ICE pb-sw ....AS RQRD | PM

L2 *When icing conditions are encountered:*

- *The flight crew may turn on the wing anti-ice to prevent ice accretion on the wing leading edge*
- *The flight crew must turn on the wing anti-ice if there is evidence of ice accretion, such as ice on the visual indicator, or on the wipers, or with the SEVERE ICE DETECTED alert. This is to remove any ice accumulation from the wing leading edge.*

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CLIMB

Ident.: PRO-NOR-SOP-14-A-00012131.0001001 / 24 NOV 23
Applicable to: ALL

Normal vertical mode is CLB or OP CLB with managed speed active.

PF MCDU....................PERF CLB | PF

L2
- *PF MCDU should be showing the PERF CLB page (allowing PF to monitor when the aircraft will reach the FCU selected altitude) but the flight crew may select other pages such as F-PLN page as may be tactically necessary*
- *The PROG page displays OPT FL and REC MAX FL. It is worth noting that this OPT FL is a function of the cost index (CI).*
- *The displayed REC MAX FL gives the aircraft at least a 0.3 g buffet margin. The flight crew may enter a cruise flight level above this level into the MCDU and the FMGS will accept it, provided that it does not exceed the level at which the margin is reduced to 0.2 g.*

L1 PM MCDU....................F-PLN | PM

L2 *PM MCDU should be showing the F-PLN page (allowing PM to enter any ATC long-term revisions to the lateral or vertical flight plan).*

L1

CLIMB SPEED MODIFICATIONS:

- **If a speed change is required by ATC, or for turbulence or operational considerations (e.g. increase CLB rate):**

  Select the new speed with FCU SPD selection knob and pull.

  Speed target is now selected.

- **To resume to MANAGED SPD profile:**

  Push FCU SPD selection knob. Speed target is now managed.

  Note: *The best rate of climb speed for long term situations lies between green dot and ECON speed. Acceleration from green dot to ECON speed at high altitude can take a long time.*

Ident.: PRO-NOR-SOP-14-A-00024910.0001001 / 06 NOV 23
Applicable to: ALL

AT THE TRANSITION ALTITUDE

BAROMETRIC REFERENCE....................SET STD/CROSSCHECK | BOTH

L2
- *At the transition altitude, the barometric setting flashes on the PFD. The flight crew should set STD on the EFIS CP and on the standby altimeter*
- *Crosscheck the barometric settings and the altitude indications.*

Ident.: PRO-NOR-SOP-14-A-00024912.0001001 / 24 NOV 23
Applicable to: ALL

CLIMB

CRZ FL.. SET AS RQRD | PF

L2
- *If the ATC clears the aircraft to the intended CRZ FL or above, there is no need to modify the CRZ FL inserted in the INIT A page during the cockpit preparation. The MCDU will automatically take into account a higher CRZ FL selected with the FCU ALT knob.*
- *If the ATC limits the CRZ FL to a lower level than the one entered in the INIT A page (or present on the PROG page), the flight crew must insert this lower CRZ FL in the PROG page. Otherwise there is no transition into CRZ phase: consequently the managed speed targets and Mach are not modified and SOFT N1 mode is not available.*
  In that case, the FMA will displays ALT instead of ALT CRZ in the second column.

L1 CLIMB SPEED MODIFICATIONS...AS RQRD | PF

Ident.: PRO-NOR-SOP-14-A-00012133.0001001 / 28 NOV 23
Applicable to: ALL

ANTI ICE

ENG ANTI ICE pb-sw ....AS RQRD | PM

L2 *Engine anti-ice must be set to ON when icing conditions (Refer to LIM-ICE_RAIN Definition of Icing Conditions) exist or are anticipated, except during climb and cruise when the SAT is below -40 °C (-40 °F).*

Ident.: TDU / PRO-NOR-SOP-14-A-00012986.0003001 / 28 NOV 23
Applicable to: LV-GKP
Impacted DU: 00012134 Climb - Radar

RADAR

RADAR..ADJUST AS APPROPRIATE | PF

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

Note: *1. If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes*
2. If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique
3. In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display
4. In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.

Ident.: PRO-NOR-SOP-14-A-00012134.0002001 / 28 NOV 23
Applicable to: LV-GKP
Impacted by TDU: 00012986 Climb - Radar

RADAR

RADAR...ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-14-A-00012134.0002001 / 28 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

RADAR

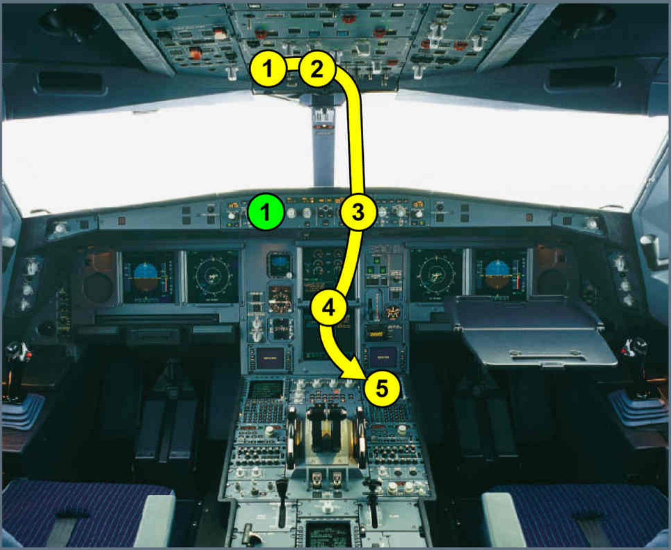
RADAR...ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-14-A-00019949.0001001 / 09 NOV 21
Applicable to: ALL

AT 10000 FT AAL FLOW PATTERN

PF Actions

PM Actions



PF:

1. EFIS OPTIONS....................AS RQRD

PM:

1. LAND sw..OFF
2. SEAT BELT sw...AS RQRD
3. EFIS OPTIONS..AS RQRD
4. ECAM MEMO..REVIEW
5. NAVAIDS/SEC F-PLAN/OPT FL/REC MAX FL..................CHECK

EFIS Option:

The PF will select CSTR for grid MORA

The PM will select ARPT

Ident.: PRO-NOR-SOP-14-A-00012135.0001001 / 09 NOV 21
Applicable to: ALL

AT 10 000 FT AAL

LAND sw...OFF	PM
SEAT BELTS sw.......................................AS RQRD	PM

EFIS OPTIONS..AS RQRD | PF-PM

L2 *Select CSTR on one side, for grid MORA (if available), and ARPT on the other side.*

L1 ECAM MEMO..REVIEW | PM

NAVAIDS..CLEAR | PM

L2 *Clear manually tuned VORs from RAD NAV page.*

L1 SEC F-PLN..AS RQRD | PM

L2 *Recopy the active flight plan in the secondary if an immediate return flight plan has been constructed previously.*

L1 OPT FL/REC MAX FL..CHECK | PM

L2 *On PROG page, check the optimum and recommended maximum flight levels.*

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CRUISE

Ident.: PRO-NOR-SOP-15-A-00011070.0002001 / 09 NOV 21
Applicable to: ALL

ECAM

L2 In cruise, the tasksharing is left to the flight crew's appreciation.

L1 ECAM MEMO....................REVIEW | PF-PM
SD PAGES....................REVIEW | PF-PM

L2 *Periodically review the system display pages and, in particular, monitor the following:*

ENG : Oil press and temperature
BLEED : BLEED parameters
ELEC : Parameters, GEN loads
HYD : Fluid quantity. After landing gear retraction, the indicated fluid quantity of the green system is higher than on ground.
COND : Duct temperature, compared with zone temperature.
Avoid large differences for passenger comfort.
F/CTL : Note any unusual control surface position.
FUEL : Fuel distribution, trim tank quantity, and CG.
DOOR : Oxygen pressure.

Ident.: PRO-NOR-SOP-15-A-00011071.0001001 / 09 NOV 21
Applicable to: ALL

FLIGHT PROGRESS

FLIGHT PROGRESS....................CHECK | PF-PM

L2 *Note: VLS, shown on the PFD, ensures a 0.3 g buffet margin. Therefore, no additional margin is necessary in cruise.*

L1 Monitor flight progress in the conventional way.

WHEN OVERFLYING A MANUALLY ENTERED WAYPOINT

- Check track and distance to the next waypoint
- Check the wind and update it if the current wind is significantly different.

WHEN OVERFLYING A WAYPOINT, OR AT LEAST EVERY 30 MIN

Check FUEL:

- Check FOB (ECAM) and fuel prediction (FMGEC), and compare with the computerized flight plan or use the performance application of the EFB
- Check that there is no fuel leak
- Check that the sum of the Fuel On Board and the Fuel Used is consistent with the Fuel On Board at departure:
  - If the value is abnormally negative, suspect a fuel leak
  - If the value is abnormally positive, suspect a fuel quantity overread.

CAUTION	This check must also be performed each time a FUEL IMBALANCE procedure is necessary. Perform the check before applying the FUEL IMBALANCE procedure. If a fuel leak is confirmed, apply the FUEL LEAK procedure.

Ident.: PRO-NOR-SOP-15-A-00011072.0001001 / 09 NOV 21
Applicable to: ALL

STEP FLIGHT LEVEL

STEP FLIGHT LEVEL.........................AS APPROPRIATE | PF-PM

Ident.: PRO-NOR-SOP-15-A-00011073.0001001 / 24 NOV 23
Applicable to: ALL

NAVIGATION ACCURACY

● **If GPS PRIMARY LOST:**

NAVIGATION ACCURACY.........................MONITOR | PF-PM

L2 *Check on FMS PROGRESS page that the required navigation accuracy is appropriate according to the flown airspace. For more information, Refer to PRO SPO 51 PBN.*

Ident.: TDU / PRO-NOR-SOP-15-A-00013075.0003001 / 09 NOV 21
Applicable to: LV-GKP
Impacted DU: 00011074 Cruise - Radar

RADAR

RADAR.........................ADJUST AS APPROPRIATE | PF

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

Note:
1. *If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes*
2. *If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique*
3. *In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display*
4. *In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.*

Ident.: PRO-NOR-SOP-15-A-00011074.0002001 / 09 NOV 21
Applicable to: LV-GKP
Impacted by TDU: 00013075 Cruise - Radar

RADAR

RADAR..ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-15-A-00011074.0002001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

RADAR

RADAR..ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-15-A-00011076.0001001 / 09 NOV 21
Applicable to: ALL

OXYGEN MASKS

- **If the oxygen mask has been used:**

  OXYGEN MASK.. CHECK | PF-PM

L2 *Check that the oxygen mask has been properly stowed (Refer to DSC-35-10 Description).*

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DESCENT PREPARATION

Ident.: PRO-NOR-SOP-16-A-00012244.0001001 / 09 NOV 21
Applicable to: ALL

DESCENT PREPARATION

Descent preparation and arrival briefing should be completed before top of descent.

Ident.: PRO-NOR-SOP-16-A-00021323.0002001 / 03 NOV 22
Applicable to: LV-KHT, LV-KHU

LANDING INFORMATION

WEATHER AND LANDING INFORMATION....................OBTAIN | PM

L2 *Check the weather reports and runway conditions at destination and alternate airports. Airfield data, if any, should include the runway to be used for arrival.*
When the aircraft operates in low OAT conditions, consider altitude corrections for low temperature.

L1 *Note:* *When icing conditions with OAT below +1 °C (34 °F) are expected at destination or alternate airports, consider to perform engine ice shedding on ground during taxi-in (Refer to PRO-NOR-SUP-ADVWXR Engine Ice Shedding on Ground).*

NAV CHARTS CLIPBOARD....................PREPARE | BOTH

L2 *Prepare the charts for arrival navigation and for the expected approach procedure and verify that both flight crewmembers refer to the same chart reference.*

Ident.: PRO-NOR-SOP-16-A-00021323.0001001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

LANDING INFORMATION

WEATHER AND LANDING INFORMATION....................OBTAIN | PM

L2 *Check the weather reports and runway conditions at destination and alternate airports. Airfield data, if any, should include the runway to be used for arrival.*
When the aircraft operates in low OAT conditions, consider altitude corrections for low temperature.

L1 *Note:* *When icing conditions with OAT at +3 °C (37 °F) or below are expected at destination or alternate airports, consider to perform engine ice shedding on ground during taxi-in (Refer to PRO-NOR-SUP-ADVWXR Engine Operations on Ground in Icing Conditions).*

NAV CHARTS CLIPBOARD....................PREPARE | BOTH

L2 *Prepare the charts for arrival navigation and for the expected approach procedure and verify that both flight crewmembers refer to the same chart reference.*

Ident.: PRO-NOR-SOP-16-A-00026519.0001001 / 24 NOV 23
Applicable to: ALL

BAROMETRIC REFERENCE

BAROMETRIC REFERENCE....................PRESET | PF-PM

L2 *Preset the QNH (QFE ❄) on the ISIS ❄ .*

Ident.: PRO-NOR-SOP-16-A-00011973.0001001 / 15 NOV 21
Applicable to: ALL

ECAM STATUS

ECAM STATUS....................CHECK | PM

L2
- *Check the ECAM status page before completing the approach checks. Take particular note of any degradation in landing capability, or any other aspect affecting the approach and landing.*
- *The ECAM STATUS page automatically appears, if not empty, when the BARO setting is selected.*

Ident.: PRO-NOR-SOP-16-A-00013713.0001001 / 09 NOV 21
Applicable to: ALL

LANDING PERFORMANCE

LANDING CONDITIONS....................CONFIRM | PF-PM

Perform an in-flight landing performance assessment if the landing conditions changed compared with the landing distance computation at dispatch, or with a previous computation (e.g. runway, weather conditions, in-flight failure affecting performance, diversion).

L2 *For more information,Refer to FCTM/PR-NP-SOP-160 Landing Performance.*

L1 ● **If landing conditions changed:**

LANDING PERF DATA....................COMPUTE | PF-PM

L2 *The PF and the PM independently compute the landing distance performance data, based on the new conditions at arrival.*

L1 *Note:* *1. If the weather conditions are expected to change at the landing airport, or in the event of significant precipitation, the flight crew should consider a second calculation of the in-flight landing distance with the worst possible runway condition*
2. The selection of REV MAX is the standard practice for landing.
However, on DRY runways the flight crew may select REV IDLE.
On WET runways (runway surface condition GOOD), the flight crew may select REV IDLE, if all the following conditions are satisfied:

- *A landing distance assessment has been made with the following parameters:*
  - *MEDIUM TO POOR landing performance level for the in-flight landing distance computation*
  - *No reverser credit.*
- *The result of this landing distance assessment is within the LDA.*

LANDING PERF DATA...CROSSCHECK | BOTH

L2 *The PF and the PM compare their EFB to ensure that the computations are the same.*
For more information, Refer to FCTM/PR-NP-SOP-160 Content of a Landing Performance Data Crosscheck

.

Ident.: PRO-NOR-SOP-16-A-00020071.0001001 / 09 NOV 21
Applicable to: ALL

FMS

ARRIVAL page.. COMPLETE/CHECK | PF

L2 *Insert APPR, STAR, TRANS and APPR VIA if applicable. (Access by lateral revision at destination).*

L1 F-PLN A page... CHECK | PF

L2
- *Check that the F-PLN agrees with the planned approach and missed approach*
- *Check the F-PLN (approach and Missed Approach tracks and distances) vs. the approach charts, using the ND in PLAN mode as necessary*
- *Check speed constraints. Add new speed constraints if required.*

- *Check altitude constraints. Add new altitude constraints if required.*

  Note: *The FMS may have deleted the altitude constraints that are at or above the CRZ FL, or at or above any previous lower CRZ FL in the case of step climbs (Refer to DSC-22_20-30-20-05 Vertical Constraints (Altitude)).*

  In that case:
  - *Insert again the affected procedures (STAR, APPR VIA or TRANS)*
    The FMS keeps the altitude constraints that are below the CRZ FL, and deletes again the altitude constraints that are above current CRZ FL. The FMS may also delete the altitude constraints that are at current CRZ FL, and the altitude constraint windows that have a constraint at or above current CRZ FL.
  - *Manually enter the altitude constraints that are below current CRZ FL using the MCDU Vertical Revision pages.*
    It is not possible to enter an altitude constraint at the CRZ FL.
    In the case of an "AT" or "AT OR ABOVE" altitude constraint at the CRZ FL, the flight crew must select the DES mode only after the aircraft reaches the position of the altitude constraint to prevent an early descent.

- *In all cases, do not modify the final approach (FAF to runway or MAP), including altitude constraints*
- *Identify the position and the altitude of Final Descent Point (FDP) and check the value of the FPA after this FDP*
- *If a TOO STEEP PATH message is displayed after the FDP, do not use FINAL APP guidance for approach*
- *Identify the Missed Approach Point.*

Ident.: PRO-NOR-SOP-16-A-00020072.0001001 / 09 NOV 21
Applicable to: ALL

DES WIND page..CHECK PF

Enter winds for descent starting at cruise flight level.

Note: *With DPO ◁, as the idle thrust margins are reduced, accurate winds have to be entered to be able to follow the computed vertical profile and thus maximize the benefits of DPO ◁. Refer to DSC-22_20-60-160 Descent Profile Optimization (if installed).*

PERF CRUISE page...CHECK PF

Modify the cabin descent rate if different pressure rate is required.

PERF DES page...CHECK PF

Prior to descent, access PERF DES page and check MANAGED MACH/SPD
If a speed other than ECON is required, insert that MACH or SPD into the ECON field.

This new MACH and/or SPD is now the one for the descent path and T/D computation, and will be used for the managed speed descent profile (instead of ECON).

L2 *A speed limit of 250 kt below 10 000 ft is the defaulted speed in the managed speed descent profile. The flight crew may delete or modify it if necessary on the VERT REV at DEST page.*

Ident.: PRO-NOR-SOP-16-A-00020073.0001001 / 03 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

PERF APPR page..COMPLETE/CHECK PF

- *Enter the QNH, temperature, and wind at destination.*

CAUTION	*During QFE operations, the flight crew must convert QFE into QNH. The CPC uses the QNH to compute the cabin pressurization profile. Therefore, the entry of QFE in QNH field of the PERF APPR page leads to an erroneous cabin pressurization profile.*

L12

Note: *Insert the average wind given by the ATC or ATIS. Do not insert the gust value. During approach, the Ground Speed Mini function (managed speed mode) takes into account the instantaneous gust.*
For more information, Refer to DSC-22_30-60-20 Ground Speed Mini Function.
For example, if the wind is 15020G35KT, insert 150/20.

- *Insert the minimum.*

Note: *To avoid undershooting the published minimum during go-around, due to aircraft inertia during pull-up, some Authorities may require Operators to add a specific number of feet to the published minimum.*

CAUTION	*If the QNH altimeter setting is used for an aircraft with the QFE option ◁ , Refer to DSC-22_20-85 QNH Use for Aircraft Equipped with QFE Option.*

Note: *Changing the RWY or type of arrival (VOR, ILS/ GLS ◁) automatically erases the previous minimum.*

Note: *After the activation of the SEC F-PLN, check the VAPP, and modify if necessary.*

- *Check or modify the landing configuration. Always select the landing configuration on the PERF APPR page:*
  - *CONF FULL or CONF 3 is the normal landing configuration. CONF 3 should be considered, depending on the available runway length and go-around performance, or if windshear/severe turbulence is considered possible during the approach.*
- *Check or modify the transition altitude/flight level.*

PERF GO AROUND page..CHECK/MODIFY PF

L2 *Check THR RED ALT and ACC ALT, and modify, if necessary.*

Ident.: PRO-NOR-SOP-16-A-00020073.0002001 / 03 NOV 23
Applicable to: LV-GKO, LV-GKP

PERF APPR page..COMPLETE/CHECK PF

- *Enter the QNH, temperature, and wind at destination.*

CAUTION	*During QFE operations, the flight crew must convert QFE into QNH. The CPC uses the QNH to compute the cabin pressurization profile. Therefore, the entry of QFE in QNH field of the PERF APPR page leads to an erroneous cabin pressurization profile.*

L12

Note: *Insert the average wind given by the ATC or ATIS. Do not insert the gust value. During approach, the Ground Speed Mini function (managed speed mode) takes into account the instantaneous gust.*
For more information, Refer to DSC-22_30-60-20 Ground Speed Mini Function.
For example, if the wind is 15020G35KT, insert 150/20.

- *Insert the minimum.*

Note: *To avoid undershooting the published minimum during go-around, due to aircraft inertia during pull-up, some Authorities may require Operators to add a specific number of feet to the published minimum.*

CAUTION	*If the QNH altimeter setting is used for an aircraft with the QFE option ⊲ , Refer to DSC-22_20-85 QNH Use for Aircraft Equipped with QFE Option.*

Note: *Changing the RWY or type of arrival (VOR, ILS/ GLS ⊲) automatically erases the previous minimum.*

Note: *After the activation of the SEC F-PLN, check the VAPP, and modify if necessary.*

- *Check or modify the landing configuration. Always select the landing configuration on the PERF APPR page:*
  - *CONF FULL or CONF 3 is the normal landing configuration. CONF 3 should be considered, depending on the available runway length and go-around performance, or if windshear/severe turbulence is considered possible during the approach.*
  - *If the forecasted tailwind at landing is more than 10 kt, CONF FULL is the recommended configuration.*
- *Check or modify the transition altitude/flight level.*

PERF GO AROUND page...CHECK/MODIFY | PF

L2 *Check THR RED ALT and ACC ALT, and modify, if necessary.*

Ident.: PRO-NOR-SOP-16-A-00020074.0002001 / 15 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

RADIO NAV page...CHECK | PF

L2
- *Set NAVAIDS, as required, and check idents on the NDs (VOR / ADF ◁) and PFDs (ILS / GLS ◁ / SLS ◁)*
- *For an ILS approach, check the frequency and course*
- *For an approach flown with GLS ◁ / SLS ◁ , check the channel and course*
- *If a VOR / DME exists close to the airfield, select it and enter its ident in the BRG / DIST field of the PROG page, for NAV accuracy monitoring during descent*
- *When the flight crew calls for an NDB approach, the system automatically tunes the ADF ◁ only when the aircraft is passing the first fix of the approach. Therefore, it is convenient to manually tune the ADF ◁ earlier (before activating the approach phase).*

L1 SELECTED NAVAIDS page..CHECK/MODIFY | PF

Ident.: PRO-NOR-SOP-16-A-00020074.0001001 / 15 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

RADIO NAV page...CHECK | PF

L2
- *Set NAVAIDS, as required, and check idents on the NDs (VOR / ADF ◁) and PFDs (ILS / GLS ◁ / SLS ◁)*
- *For an ILS approach, check the frequency and course*
- *For an approach flown with GLS ◁ / SLS ◁ , check the channel and course*
- *If a VOR / DME exists close to the airfield, select it and enter its ident in the BRG / DIST field of the PROG page, for NAV accuracy monitoring during descent*
- *When the flight crew calls for an NDB approach, the system automatically tunes the ADF ◁ only when the aircraft is passing the first fix of the approach. Therefore, it is convenient to manually tune the ADF ◁ earlier (before activating the approach phase).*

Ident.: PRO-NOR-SOP-16-A-00020076.0001001 / 09 NOV 21
Applicable to: ALL

SEC F-PLN page...AS RQRD | PF

L2 *The SEC F-PLN should be set before the top of descent, either to an alternative runway for destination, or to the landing runway in case of circling. In all cases, the routing to the alternate should be available. If there is a last-minute runway change, then the flight crew needs only to activate the secondary F-PLN, without forgetting to check/set the new minimum, and NAVAIDs.*

Ident.: PRO-NOR-SOP-16-A-00023628.0001001 / 09 NOV 21
Applicable to: ALL

FMS PREPARATION....................CROSSCHECK | PM

L2 *After the PF prepares the FMS, the PM checks all the data entered in the FMS. The PM should have the same mental image of the intended arrival and approach procedure, trajectory, and constraints than the PF. The PM should check with the PF if anything is not clear.*

For more information, *Refer to FCTM/PR-NP-SOP-160 Landing Performance*.

Ident.: PRO-NOR-SOP-16-A-00015234.0001001 / 09 NOV 21
Applicable to: ALL

LANDING ELEVATION

LDG ELEV....................CHECK | PF

L2 *Check that the LDG ELEV AUTO is displayed on the CRUISE page, and check the associated value.*

Ident.: PRO-NOR-SOP-16-A-00012251.0001001 / 09 NOV 21
Applicable to: ALL

AUTOBRAKE

AUTO BRK....................AS RQRD | PF

Use of the autobrake is preferable.
Use of MAX mode is not recommended at landing.
On short or contaminated runways, use MED mode.
On long runways, LO mode is recommended

L2 *For more information, Refer to FCTM/PR-NP-SOP-160 Brakes Oxidation.*

L1 *Note: If, on very long runways, the flight crew anticipates that braking will not be needed, use of the autobrake is unnecessary.*

Press the appropriate pushbutton, according to runway length and condition, and check that the related ON light comes on.

Ident.: PRO-NOR-SOP-16-A-00012249.0001001 / 09 NOV 21
Applicable to: ALL

ARRIVAL BRIEFING

ARRIVAL BRIEFING....................PERFORM | BOTH

Ident.: PRO-NOR-SOP-16-A-00011969.0001001 / 09 NOV 21
Applicable to: LV-GKP
Impacted by TDU: 00012996 Descent Preparation - Radar

RADAR

RADAR..........ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-16-A-00011969.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

RADAR

RADAR..........ADJUST AS APPROPRIATE | PF

Ident.: TDU / PRO-NOR-SOP-16-A-00012996.0003001 / 09 NOV 21
Applicable to: LV-GKP
Impacted DU: 00011969 Descent Preparation - Radar

RADAR

RADAR..........ADJUST AS APPROPRIATE | PF

Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200.

Note:
1. *If the weather is good, or not significant, in order to check that the radar is operating correctly: Down tilt until displaying ground echoes*
2. *If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use manual tilt according to standard technique*
3. *In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to Manual mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display*
4. *In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and Manual modes to display lower levels of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.*

Ident.: PRO-NOR-SOP-16-A-00012253.0002001 / 24 NOV 23
Applicable to: ALL

ANTI ICE

CAUTION	In icing conditions (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG 1 and 2 ANTI ICE pb-sw .... AS RQRD PM

L2 *Engine anti-ice must be set to ON before and during descent, even if the SAT is below -40 °C (-40 °F).*
With ENG ANTI ICE pb-sw ON, the FADEC automatically selects a higher idle thrust, which gives better protection against engine flame-out.

L1 WING ANTI ICE pb-sw .... AS RQRD PM

When icing conditions are encountered:
- The flight crew may turn on the wing anti-ice to prevent ice accretion on the wing leading edge
- The flight crew must turn on the wing anti-ice if there is evidence of ice accretion, such as ice on the visual indicators, or on the wipers, or with the SEVERE ICE DETECTED alert. This is to remove any ice accumulation on the wing leading edge.

ANTI ICE ON reduces the descent path angle (when the engines are at idle). The flight crew can compensate for this by increasing descent speed, or by extending up to half speedbrakes.

Ident.: PRO-NOR-SOP-16-A-00012252.0001001 / 09 NOV 21
Applicable to: ALL

DESCENT CLEARANCE

DESCENT CLEARANCE.. OBTAIN PM
CLEARED ALTITUDE ON FCU.. SET PF

L2 *When the flight crew obtains the ATC clearance, they should set the cleared altitude (FL) on the FCU taking into account the safe altitudes.*
If the lowest safe altitude is above the cleared altitude, check with the ATC to determine if this constraint applies.
If the ATC confirms that this constraint applies, set the safe altitude on the FCU until it is safe to reach the cleared altitude.

DESCENT INITIATION

Ident.: PRO-NOR-SOP-17-00011965.0001001 / 09 NOV 21
Applicable to: ALL

DESCENT INITIATION

DESCENT.. INITIATE | PF

L2 The standard method to initiate the descent is to engage the DES mode at the Top of Descent (T/D) computed by the FMS.

L1 For more information on T/D and profile computation, *Refer to FCTM/PR-NP-SOP-170 Computation Principles*.

■ **If ATC requires an early descent:**

Use the DES mode.

The DES mode guides the aircraft down to a lower vertical speed, in order to converge with the required descent path (The flight crew may use a V/S of 1 000 ft/min).

■ **If the descent is delayed by ATC:**

Beyond the T/D, the DECELERATE or T/D REACHED message appears on the PFD and MCDU. This suggests that the flight crew should reduce the speed toward green dot speed with ATC permission.

When cleared for descent, engage DES mode with the managed speed active.

DESCENT MONITORING

Ident.: PRO-NOR-SOP-17-00011966.0001001 / 09 NOV 21
Applicable to: ALL

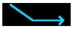
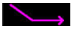
DESCENT MONITORING

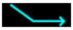
PF MCDU..PROG/PERF DES | PF

L2 *PF MCDU should be set to PROG or PERF DES page:*
- *PROG page in order to get VDEV information*
- *PERF DES in order to get predictions down to any inserted altitude in DES/OP DES modes.*

L1 PM MCDU.. F-PLN | PM
DESCENT.. MONITOR/ADJUST | PF

L2 *Refer to PRO-NOR-SRP-01-60 Descent Monitoring - DES Mode Engaged.*

- *When flying in NAV mode, use the DES mode.*
  - *Monitor the VERT DEV*
    The VERT DEV appears on the PFD and on the PROG page.
  - *Monitor the FMA when the aircraft reaches the level-off symbol (i.e.*  *or* *)*

  Note: *The NDs display a level-off symbol*  *along the flight path. The position of this symbol is based on the current active modes: i.e. AP/FD and A/THR.*

- *MCDU predictions assume a return to the lateral F-PLN and descent flight path.*
- *Note that whenever the lateral mode is changed from NAV to HDG/TRK the vertical mode reverts to V/S at the value pertaining at the time of the mode change.*
- *From time to time during stabilized descent, the flight crew may select FPA to check that the remaining distance to destination is approximately the altitude change required divided by the FPA in degrees.*
- *FPA (°) = Δ FL/DIST (NM)*

DESCENT ADJUSTMENT

Applicable to: ALL

Ident.: PRO-NOR-SOP-17-A-00011967.0001001 / 09 NOV 21

DESCENT ADJUSTMENT

RATE of DESCENT...ADJUST, AS RQRD | PF

L2 *To increase the rate of descent, increase the descent speed by using the selected speed, if comfort and the ATC permit. It is more cost-effective (Time/Fuel) than using the speed brakes:*

- *Maintain a high speed as long as possible, provided that the ATC permits to fly above the speed limits*
- *If the aircraft is high and at high speed, it is more efficient to keep the high speed until ALT* then to decelerate at level-off, instead of combining descent and deceleration*
- *If the aircraft goes below the desired profile, use the selected speed and the V/S mode to adjust the rate of descent.*

In the OP DES mode, the flight crew can use the speed brakes to increase the rate of descent. The flight crew can also use the speed brakes to maintain the required rate of descent, when engine anti-ice is used.
In the DES mode, if the aircraft is on, or below the flight path and the ATC requires a higher rate of descent, do not use the speed brakes because the rate of descent is imposed by the planned flight path. Therefore, the A/THR may increase thrust to compensate for the increase in drag. In this case, use the OP DES mode with speed brakes.

Ident.: PRO-NOR-SOP-17-A-00011971.0001001 / 15 NOV 21

TERRAIN ON ND

TERR ON ND....................AS RQRD | PF-PM

L2
- *In mountainous areas, consider displaying terrain on ND.*
- *If use of radar is required, consider selecting the radar display on the PF side, and TERR ON ND on the PM side only.*
- *If NAV ACCURACY is LOW, do not use the TERR on ND.*

Ident.: PRO-NOR-SOP-17-A-00011970.0002001 / 06 NOV 23

BAROMETRIC REFERENCE

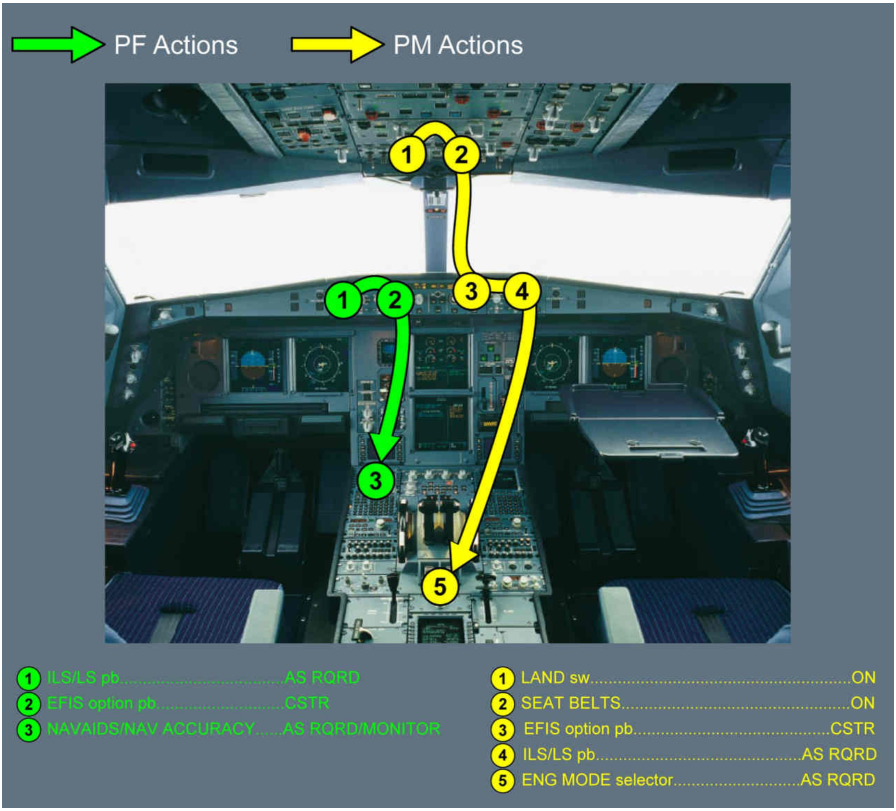
- **When the aircraft approaches the transition level, and when cleared for an altitude:**
  BAROMETRIC REFERENCE....................SET/CROSSCHECK | BOTH

L2
- *Set QNH on the EFIS control panel and on the standby altimeter*
- *Crosscheck the barometric reference settings and the altitude indications.*

L1
Note: *The flight crew must take into account any QNH change on the EFIS control panels, standby altimeter and on the FMS PERF APPR page.*
The flight crew should pay attention to a barometric reference that significantly differs from the one used for approach preparation. That could be the symptom of a barometric reference error. In this case the flight crew should consider the confirmation of the barometric reference from all available sources.

Ident.: PRO-NOR-SOP-17-A-00019963.0001001 / 24 NOV 23

AT 10 000 FT AAL FLOW PATTERN


PF Actions
PM Actions
1
2
1
2
3
3
4
5
1 ILS/LS pb....AS RQRD
2 EFIS option pb....CSTR
3 NAVAIDS/NAV ACCURACY......AS RQRD/MONITOR
1 LAND sw....ON
2 SEAT BELTS....ON
3 EFIS option pb....CSTR
4 ILS/LS pb....AS RQRD
5 ENG MODE selector....AS RQRD

Ident.: PRO-NOR-SOP-17-A-00011974.0002001 / 15 NOV 21

AT 10 000 FT AAL

LAND sw..SET | PM

L2 *LAND lights may be switched ON, depending on the airline policy or regulatory recommendation.*

L1 SEAT BELTS sw..ON | PM

EFIS option pb..CSTR | PF-PM

L2 *Select CSTR on both sides.*

L1 LS pb...AS RQRD | PF-PM

L2 *Press the LS pb, if one of the following approaches is planned:*
- *ILS, GLS* ◁
- *ILS G/S out, LOC only, LOC B/C*
- *Approach with the FLS* ◁ *function*
- *Approach with the SLS* ◁ *function.*

The flight crew checks that:
- *Deviation scales are displayed on the PFD*
- *The IDENT is properly displayed on the PFD.*

L1 NAVAIDS...AS RQRD/CHECK | PF

L2 *Ensure that the appropriate navaids are tuned and identified.*

Ident.: PRO-NOR-SOP-17-A-00015239.0001001 / 09 NOV 21

ENG START selector...AS RQRD | PM

L2 *Select IGN if the runway is covered with standing water, or if heavy rain or severe turbulence is expected during approach or go-around area.*

Ident.: PRO-NOR-SOP-17-A-00015240.0001001 / 24 NOV 23

● **If GPS PRIMARY LOST:**

NAVIGATION ACCURACY...MONITOR | PF

L2 *Check on FMS PROGRESS page that the required navigation accuracy is appropriate according to the flown airspace. For more information, Refer to PRO SPO 51 PBN.*

APPROACH CHECKLIST

Ident.: PRO-NOR-SOP-17-00014478.0001001 / 18 NOV 21
Applicable to: ALL

APPROACH CHECKLIST

APPROACH C/L...COMPLETE | PF-PM

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Approach General

INTRODUCTION

Ident.: PRO-NOR-SOP-18-A-00014468.0001001 / 15 NOV 21
Applicable to: ALL

The APPROACH section provides the standard operating procedures for the following approach types:

- ILS / GLS ◁ approaches
- Conventional approaches: VOR, VOR-DME, NDB, NDB-DME
- Approaches based on a LOC signal without any G/S signal: LOC ONLY, ILS G/S OUT, LOC B/C
- RNAV approaches including:
  - RNAV(GNSS) approaches with LNAV or LNAV/VNAV minima (with FLS ◁)
  - RNAV(GNSS) approaches with LPV or LP minima (with SLS ◁)
  - RNAV(RNP) approaches for which Authorization is Required (AR).

Note: *In relation to the names in the ICAO Performance-Based Navigation (PBN) Manual:*
- *"RNP APCH operations" corresponds to RNAV(GNSS) approaches*
- *"RNP AR APCH operations" corresponds to RNAV(RNP) approaches.*

CROSS-REFERENCE TABLE

Ident.: PRO-NOR-SOP-18-A-00014469.0001001 / 15 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

This table provides Guidance Modes that may be used depending on the Approach Types.

	Guidance Modes per Approach Types				
	LOC G/S	**FINAL APP**	**LOC FPA or LOC B/C FPA**	**NAV FPA**	**TRK FPA**
ILS / GLS ◁	*Refer to APPR using LOC G/S*	N/A	N/A	N/A	N/A
LOC ONLY ILS G/S OUT LOC B/C	N/A	N/A	*Refer to APPR using FPA Guidance*	N/A	N/A
RNP or RNAV(GNSS) with LNAV/VNAV minima	N/A	*Refer to APPR using FINAL APP*	N/A	Not Authorized	Not Authorized

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Continued from the previous page

	Guidance Modes per Approach Types				
	LOC G/S	**FINAL APP**	**LOC FPA or LOC B/C FPA**	**NAV FPA**	**TRK FPA**
RNP or RNAV(GNSS) with LNAV minima	N/A	*Refer to APPR using FINAL APP* (1)	N/A	*Refer to APPR using FPA Guidance*	Not Authorized
RNP or RNAV(GNSS) with LPV minima	N/A	Not Authorized	N/A	Not Authorized	Not Authorized
VOR VOR-DME NDB NDB-DME	N/A	*Refer to APPR using FINAL APP* (1)	N/A	*Refer to APPR using FPA Guidance*	*Refer to APPR using FPA Guidance*

(1) *The FINAL APP is the recommended guidance mode for this type of approach.*

For Visual Approach, *Refer to Visual Approach*
For Circling Approach, *Refer to Circling Approach*

Note: *The names of the approach and departure charts evolve. For convenience purposes the Cross-Reference table provides both names.*
RNP is equivalent to RNAV(GNSS).

CROSS-REFERENCE TABLE

Ident.: PRO-NOR-SOP-18-A-00014469.0003001 / 15 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

This table provides Guidance Modes that may be used depending on the Approach Types.

	Guidance Modes per Approach Types				
	LOC G/S	**FINAL APP**	**LOC FPA or LOC B/C FPA**	**NAV FPA**	**TRK FPA**
ILS / GLS ◁	*Refer to APPR using LOC G/S*	N/A	N/A	N/A	N/A
LOC ONLY ILS G/S OUT LOC B/C	N/A	N/A	*Refer to APPR using FPA Guidance*	N/A	N/A

Continued on the following page

Continued from the previous page

	Guidance Modes per Approach Types				
	LOC G/S	**FINAL APP**	**LOC FPA or LOC B/C FPA**	**NAV FPA**	**TRK FPA**
RNP or RNAV(GNSS) with LNAV/VNAV minima	N/A	*Refer to APPR using FINAL APP*	N/A	Not Authorized	Not Authorized
RNP or RNAV(GNSS) with LNAV minima	N/A	*Refer to APPR using FINAL APP* (1)	N/A	*Refer to APPR using FPA Guidance*	Not Authorized
RNP or RNAV(GNSS) with LPV minima	N/A	Not Authorized	N/A	Not Authorized	Not Authorized
VOR VOR-DME NDB NDB-DME	N/A	*Refer to APPR using FINAL APP* (1)	N/A	*Refer to APPR using FPA Guidance*	*Refer to APPR using FPA Guidance*
RNP(AR) or RNAV(RNP)	N/A	*Refer to APPR using FINAL APP for RNAV(RNP)*	N/A	Not Authorized	Not Authorized

(1) *The FINAL APP is the recommended guidance mode for this type of approach.*

For Visual Approach, *Refer to Visual Approach*
For Circling Approach, *Refer to Circling Approach*

Note: *The names of the approach and departure charts evolve. For convenience purposes the Cross-Reference table provides both names.*
RNP is equivalent to RNAV(GNSS).
RNP(AR) is equivalent to RNAV(RNP).

FLYING REFERENCE

Ident.: PRO-NOR-SOP-18-A-00014470.0001001 / 29 MAY 13
Applicable to: ALL

Use the following recommended flying reference:
- In vertical managed modes: HDG-V/S reference associated with the FD crossbars
- In vertical selected modes: TRK-FPA reference associated with FPD.

STABILIZATION CRITERIA

Ident.: PRO-NOR-SOP-18-A-00014471.0001001 / 04 DEC 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The stabilization height is defined as one of the following:
- 1 000 ft above airfield elevation (AAL) in Instrument Meteorological Conditions (IMC), or
- 500 ft above airfield elevation (AAL) in Visual Meteorological Conditions (VMC), or
- Any other height defined in Operator policies or regulations.

In order for the approach to be stabilized, all of the following conditions must be satisfied before, or at the stabilization height:
- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the desired landing configuration
- The thrust is stabilized, usually above idle, and the aircraft is at target speed for approach

Note: *In IMC, a later speed and thrust stabilization can be acceptable provided that:*
- *It is in accordance with Operator policies and regulations*
- *The aircraft is in deceleration toward the target approach speed*
- *The flight crew stabilizes speed and thrust as soon as possible and not later than 500 ft AAL.*

- The flight crew does not detect any excessive flight parameter deviation.

If one of the above-mentioned conditions is not satisfied, the flight crew must initiate a go-around, unless they estimate that only small corrections are required to recover stabilized approach conditions.

STABILIZATION CRITERIA

Ident.: PRO-NOR-SOP-18-A-00014471.0003001 / 04 DEC 18
Applicable to: LV-GKO, LV-GKP

The stabilization height is defined as one of the following:
- 1 000 ft above airfield elevation (AAL) in Instrument Meteorological Conditions (IMC), or
- 500 ft above airfield elevation (AAL) in Visual Meteorological Conditions (VMC), or
- Any other height defined in Operator policies or regulations.

In order for the approach to be stabilized, all of the following conditions must be satisfied before, or at the stabilization height:
- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the desired landing configuration

- The thrust is stabilized, usually above idle, and the aircraft is at target speed for approach

  Note: *In IMC, a later speed and thrust stabilization can be acceptable provided that:*
  - *It is in accordance with Operator policies and regulations*
  - *The aircraft is in deceleration toward the target approach speed*
  - *The flight crew stabilizes speed and thrust as soon as possible and not later than 500 ft AAL.*
- The flight crew does not detect any excessive flight parameter deviation.

If one of the above-mentioned conditions is not satisfied, the flight crew must initiate a go-around, unless they estimate that only small corrections are required to recover stabilized approach conditions.

Note: *If the forecasted tailwind at landing is greater than 10 kt, decelerated approach is not allowed, and the speed should be stabilized around VREF +5 kt in final.*

APPROACH SPEED TECHNIQUE

Ident.: PRO-NOR-SOP-18-A-00014472.0001001 / 24 NOV 23
Applicable to: ALL

DECELERATED APPROACH

The decelerated approach with FD or AP/FD guidance is the standard flying technique for ILS / GLS approaches and approaches using FLS , SLS , or FINAL APP guidance.

EARLY STABILIZED APPROACH

Under certain circumstances, the flight crew may decide to reduce the speed down to VAPP in the landing configuration by the FDP (approach via selected guidance, high glide path angle, low altitude intermediate approach, etc.). In order to obtain a valuable deceleration pseudo waypoint and to ensure a timely deceleration, the flight crew should enter VAPP as a speed constraint at the FDP.

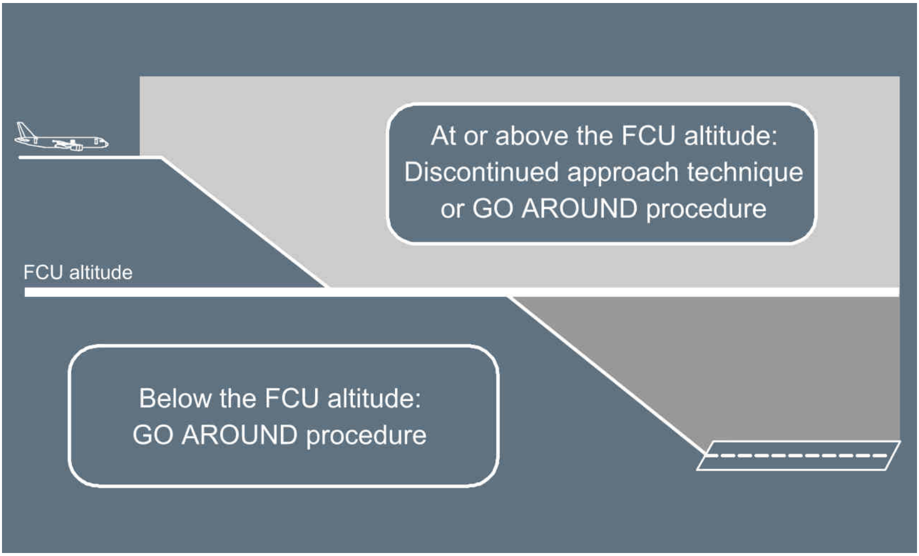
DISCONTINUED APPROACH

Ident.: PRO-NOR-SOP-18-A-00015153.0001001 / 15 NOV 21
Applicable to: ALL

In order to discontinue an approach when the aircraft is at or above the altitude selected on the FCU, the flight crew can either:

- Apply the GO AROUND procedure, or
- Apply the discontinued approach technique.

When the aircraft is below the FCU altitude, the flight crew must apply the GO AROUND procedure.


At or above the FCU altitude:
Discontinued approach technique
or GO AROUND procedure
FCU altitude
Below the FCU altitude:
GO AROUND procedure

- **If at or above the FCU altitude:**

  Announce "CANCEL APPROACH".

  To disarm any AP/FD approach mode, press APPR pb or LOC pb.

  Note: *Valid only for ILS / GLS ◁ / FLS ◁ / SLS ◁ or FINAL APP guidance.*

  Select lateral mode as required (NAV or HDG mode).

  Select vertical mode as required (level off or adjust V/S).

  Select SPEED and adjust.

- **If F-PLN has no destination anymore:**

  Perform a LAT REV at the last waypoint and redefine the destination in the NEW DEST field.

  Note: 1. *The FMS does not automatically string the previous flown approach in the active F-PLN when the aircraft overflies the last waypoint. The FMS has no more destination in the F-PLN.*
  2. *Because the thrust levers are not set to TOGA detent, the FMS remains in approach phase.*

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Aircraft Configuration Management

INITIAL APPROACH

Ident.: PRO-NOR-SOP-18-B-A-00014474.0001001 / 29 MAY 13
Applicable to: ALL

GENERAL

The initial approach procedure described here is a general guidance whatever the type of approach expected.

Ident.: PRO-NOR-SOP-18-B-A-00014475.0001001 / 09 NOV 21
Applicable to: ALL

INITIAL APPROACH

F-PLN SEQUENCING....................ADJUST | PF

L2
- *A good clue to monitor the proper F-PLN sequencing is the TO waypoint on the upper right side of the ND, which should remain meaningful*
- *In NAV mode, the F-PLN will sequence automatically*
- *In HDG or TRK mode, the F-PLN will sequence automatically only if the aircraft flies close to the F-PLN route.*

L1 APPROACH PHASE....................CHECK/ACTIVATE | BOTH

L2
- *If the aircraft overflies the DECEL pseudo waypoint in NAV mode, the APPR phase activates automatically*
- *If the aircraft is in HDG or TRK mode, approximately 15 NM from touchdown activate and confirm APPR phase on the PERF DES page.*

L1 MANAGED SPEED....................CHECK | PF

L2 *If ATC requires a particular speed, use selected speed. When the ATC speed constraint no longer applies, return to managed speed.*

L1 FLIGHT PATH....................MONITOR | PF

L2
- *In NAV mode, use V/DEV information on the PFD and PROG page*
- *In HDG or TRK mode, use the energy circle on ND representing the required distance to land.*

L1 SPEED BRAKES lever...AS RQRD | PF

L2
- *If the flight crew uses the speed brakes to increase the rate of deceleration or to increase the rate of descent, the VLS will increase as well:*
  - *The flight crew should ensure that appropriate speed margin exists before the extension of the speed brakes*
  - *If the speed brakes are extended, the flight crew should ensure that appropriate speed margin exists before the beginning of a turn.*

  This will avoid the activation of the Alpha-Floor protection.

Ident.: TDU / PRO-NOR-SOP-18-B-A-00014535.0005001 / 09 NOV 21
Applicable to: LV-GKP
Impacted DU: 00014476 Initial Approach - Radar

RADAR

RADAR...ADJUST AS APPROPRIATE | PF

L2
- *Gain must be manually set to +4, when MULTISCAN sw is set to AUTO and when flying below FL 200*
- *If the weather is good, or not significant, in order to check that the radar is operating correctly: down tilt until displaying ground echoes*
- *If the weather display is ambiguous or unexpected, in order to better analyze the weather situation, use MANUAL TILT according to standard techniques*
- *In particular below FL 200, for situations with low-level weather, weather with low reflectivity or in front of suspected active cells, the flight crew should switch to MANUAL mode and adjust the tilt setting downward until the weather is detected or the ground clutter appears on the upper part of the display*
- *In addition, the flight crew may increase the manual gain control to display lower reflectivity targets. The manual gain control can be increased in both AUTO and MANUAL modes to display lower targets of weather. In both cases, ground clutter may also be displayed as a result of low settings and/or increased gain.*

Ident.: PRO-NOR-SOP-18-B-A-00014476.0001001 / 09 NOV 21
Applicable to: LV-GKP
Impacted by TDU: 00014535 Initial Approach - Radar

RADAR

RADAR...ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-18-B-A-00014476.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

RADAR

RADAR...ADJUST AS APPROPRIATE | PF

Ident.: PRO-NOR-SOP-18-B-A-00014477.0001001 / 24 NOV 23
Applicable to: ALL

NAVIGATION ACCURACY

- **If GPS PRIMARY LOST:**

NAVIGATION ACCURACY............MONITOR | PM

L2 *Check on FMS PROGRESS page that the required navigation accuracy is appropriate according to the flown airspace. For more information, Refer to PRO SPO 51 PBN.*

INTERMEDIATE/FINAL APPROACH

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-B-B-00014479.0001001 / 29 MAY 13

GENERAL

The intermediate and final approach procedure described here is a general guidance whatever the type of approach expected.

Ident.: PRO-NOR-SOP-18-B-B-00014480.0001001 / 09 NOV 21

AT GREEN DOT SPEED

CAUTION	The flight crew should avoid extended flight in icing conditions with the slats extended.

FLAPS 1............ORDER | PF
FLAPS 1............SELECT | PM

L2
- *FLAPS 1 should be selected more than 3 NM before the Final Descent Point*
- *Check the aircraft deceleration toward S speed*
- *For decelerated approaches, the aircraft must reach or be established on the final descent with FLAPS 1 and S speed at or above 2 500 ft AGL*
- *If the aircraft does not decelerate on the flight path or aircraft speed is significantly higher than S speed, extend the landing gear in order to slow down. The use of speed brakes is possible. However, the flight crew should be aware that the use of speed brakes causes an increase in VLS.*

L1 TCAS Mode selector............TA or TA/RA | PM

L2 *FAA recommends to select TA only mode:*
- *In case of known nearby traffic which is in visual contact*
- *At particular airports and during particular procedures identified by an Operator as having a significant potential for unwanted or inappropriate resolution advisories (e.g. closely-spaced parallel runways, converging runway, low terrain along the final approach, etc.).*

Ident.: PRO-NOR-SOP-18-B-B-00014481.0001001 / 15 NOV 21

AT 2500 FT AGL MINIMUM

FLAPS 2	ORDER	PF
FLAPS 2	SELECT	PM

L2
- *Check the aircraft deceleration toward F speed*
- *For ILS, GLS ◁ , SLS ◁ , FLS ◁ , if the aircraft intercepts the flight path below 2 500 ft AGL (2 000 ft AGL minimum), select FLAPS 2 at one dot below the flight path*
- *If the aircraft speed is significantly higher than F speed on the flight path, or the aircraft does not decelerate on the flight path, extend the landing gear in order to slow down the aircraft. The use of speed brakes is not recommended*
- *When the speed brakes are deployed, extending the FLAPS beyond FLAPS 1 may induce a slight roll movement, and in calm conditions a small lateral control asymmetry may remain until disturbed by a control input or by an atmospheric disturbance.*

Ident.: PRO-NOR-SOP-18-B-B-00014482.0001001 / 24 NOV 23

WHEN FLAPS ARE AT 2

L/G DOWN	ORDER	PF
L/G lever	SELECT DOWN	PM
AUTO BRK	CONFIRM	PM

Note: If the runway conditions have changed from the arrival briefing, consider another braking mode.

GROUND SPOILERS	ARM	PM

EXTERIOR LIGHTS

NOSE sw	T.O	PM
RWY TURN OFF sw	ON	PM

Ident.: PRO-NOR-SOP-18-B-B-00014483.0006001 / 24 NOV 23

WHEN LANDING GEAR IS DOWN

FLAPS 3	ORDER	PF
FLAPS 3	SELECT	PM

ECAM WHEEL SD page....................CHECK | PM

L2
- *WHEEL SD page appears below 800 ft, or at landing gear extension*
- *Check for three green indications on the landing gear indicator panel. At least one green triangle on each landing gear strut on the WHEEL SD page is sufficient to indicate that the landing gear is downlocked. Rely also on the LDG GEAR DN LDG MEMO message to confirm that the landing gear is downlocked.*

L1 FLAPS FULL....................ORDER | PF
FLAPS FULL....................SELECT | PM

L2
- *Check that the aircraft decelerates to VAPP*
- *Check correct TO waypoint on the ND.*

L1 A/THR....................CHECK IN SPEED MODE OR OFF | PM
WING ANTI ICE pb-sw....................OFF | PM

L2 *Switch the WING ANTI ICE pb-sw ON, only in severe icing conditions.*

L1 SLIDING TABLE.................... STOW | PF-PM
ALL EFB (with no mounted equipment).................... STOW | PF-PM
LDG MEMO.................... CHECK NO BLUE | PM
CABIN REPORT.................... RECEIVE | PF-PM

L2 *Check CABIN READY in the EWD, or obtain the cabin report from the purser.*

L1 LANDING C/L....................COMPLETE | PF-PM
CABIN CREW....................ADVISE | PM

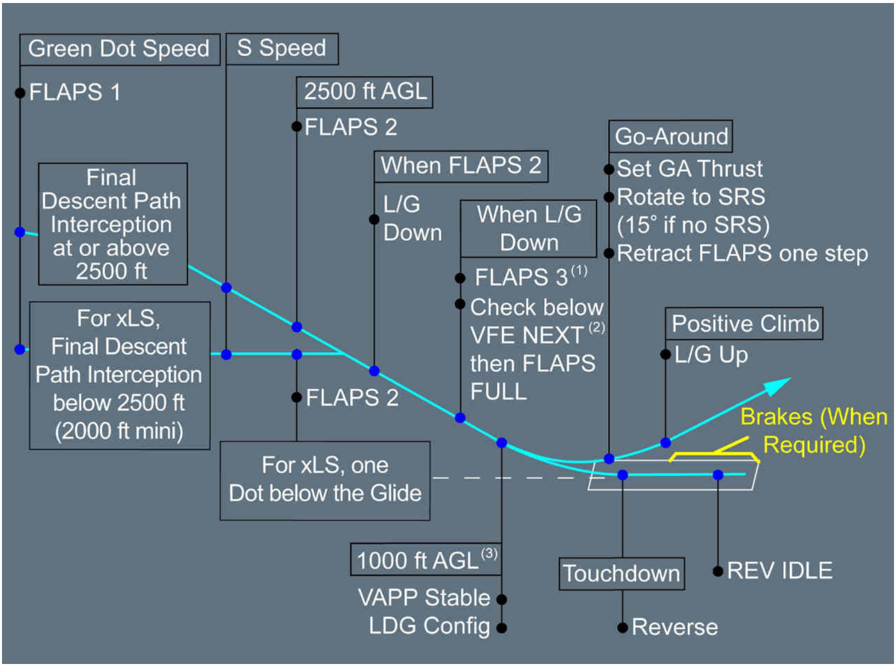
L2 *Advise the cabin crew that landing is imminent.*

L1 FLIGHT PARAMETERS....................MONITOR | PM

L2
- *The PF announces any FMA modification*
- *The PM calls out, if:*
  - *The speed goes lower than the speed target -5 kt, or more than the speed target +10 kt*
  - *The pitch attitude goes lower than 0 °, or more than +10 ° nose up*
  - *The bank angle becomes more than 7 °*
  - *The descent rate becomes more than 1 200 ft/min.*
- *Following PM flight parameter exceedance callout, the suitable PF response will be:*
  - *Acknowledge the PM callout, for proper crew coordination purposes*
  - *Take immediate corrective action to control the exceeded parameter back into the defined stabilized conditions*
  - *Assess whether stabilized conditions will be recovered early enough prior to landing, otherwise initiate a go-around.*

Ident.: PRO-NOR-SOP-18-B-B-00014485.0001001 / 15 NOV 21

PATTERN (DECELERATED)


Green Dot Speed
FLAPS 1
S Speed
2500 ft AGL
FLAPS 2
Final Descent Path Interception at or above 2500 ft
For xLS, Final Descent Path Interception below 2500 ft (2000 ft mini)
When FLAPS 2
L/G Down
When L/G Down
FLAPS 3 (1)
Check below VFE NEXT (2) then FLAPS FULL
Go-Around
Set GA Thrust
Rotate to SRS (15° if no SRS)
Retract FLAPS one step
Positive Climb
L/G Up
FLAPS 2
For xLS, one Dot below the Glide
Brakes (When Required)
1000 ft AGL (3)
VAPP Stable
LDG Config
Touchdown
Reverse
REV IDLE

Note: *This approach assumes the use of managed speed.*

If not, select speed manually:
S after FLAPS 1 selection
F after FLAPS 2 selection
VAPP after LDG FLAPS selection.

Note: *If earlier stabilization at VAPP is required, start deceleration at higher altitude.*

Note:
1. *The change in FLAPS setting is almost continuous and takes into account the extension time of the surfaces. However, the flight crew must consider VFE NEXT that appears on the PFD in some cases (e.g. heavy aircraft).*
2. *To minimize FLAPS wear, extend FLAPS at VFE -15 kt when possible.*
3. *1 000 ft AGL minimum IMC, 500 ft AGL minimum VMC, or in accordance with the airline policy and regulations.*

Aircraft Guidance Management

APPROACH USING LOC G/S GUIDANCE

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-A-00014487.0001001 / 15 NOV 21

GENERAL

The following items are to be performed in addition to previous SOP chapters for approach flown with ILS / GLS ◁✳ / SLS ◁✳ .

Ident.: PRO-NOR-SOP-18-C-A-00020760.0001001 / 09 NOV 21

DESCENT PREPARATION

APPROACH MINIMUM....................DETERMINE | PF

L2 - *For CAT II, CAT III, approaches, always choose the lowest achievable minimum. The approach minimum is limited by:*
  - *Crew qualification*
  - *Airline Operating Manual requirement*
  - *Aircraft technical status*
  - *Airport status*

- *For CAT III with no DH, the flight crew should enter NO in the DH field of the MCDU to avoid false "HUNDRED ABOVE" or "MINIMUM" auto callouts which would not be applicable.*

L1 ARRIVAL BRIEFING....................PERFORM | BOTH

L2 *For CAT II, CAT III, approaches, review the following items on top of the usual briefing:*
- *Task sharing and callouts*
- *Management of degraded guidance*
- *Low visibility procedures at the airport.*

Ident.: PRO-NOR-SOP-18-C-A-00014488.0001001 / 09 NOV 21

INITIAL/INTERMEDIATE APPROACH

APPR pb on FCU	PRESS	PF

L2 - *Press the APPR pb when all of the following is applicable:*

- *The aircraft is cleared for the approach*
- *The aircraft is on the intercept trajectory for the final approach course*
- *LOC deviation is available on the PFD.*

This arms the LOC and G/S modes

- *LOC and/or G/S capture modes will engage no sooner than 3 s after being armed.*

L1 *Note: In NAV mode, the aircraft may leave the F-PLN to capture the LOC.*

L3 *ICAO defines the envelope where the quality of the G/S signal ensures a normal capture. This envelope is within 10 NM , ±8 ° of the centerline of the ILS glide path and up to 1.75 Θ and down to 0.3 Θ (Θ = nominal glide path angle). When arming the approach well outside of the normal G/S capture envelope, a spurious G/S* engagement may occur due to a wrong G/S deviation signal. Whenever the flight crew notices the pitch movement, or the spurious G/S*, or the trajectory deviation, the flight crew will immediately disconnect the AP, if engaged, to re-establish a normal attitude and will disengage APPR mode. It is then recommended to arm/rearm APP (ILS) mode within the normal capture zone.*

L1

BOTH APs	ENGAGE	PF

L2

- *When APPR mode is selected, AP1 and AP2 should be engaged*
- *Above 5 000 ft AGL, the FMA displays CAT 1*
- *Below 5 000 ft AGL, the FMA displays the correct approach capability for the intended approach.*

L1

LOC	CHECK ARMED	PF
G/S	CHECK ARMED	PF
LOC CAPTURE	MONITOR	PF
G/S CAPTURE	MONITOR	PF
GO-AROUND ALTITUDE	SET	BOTH

Ident.: PRO-NOR-SOP-18-C-A-00014489.0001001 / 09 NOV 21

GLIDE INTERCEPTION FROM ABOVE

The following procedure must only be applied when established on the localizer. The flight crew must react without delay to meet the stabilization criteria.

In order to get the best rate of descent when cleared by ATC and below the limiting speeds, the flight crew should lower the landing gear and select flaps as required (at least CONF 2 should be selected to ensure that the aircraft speed will not increase).

- **If above the glideslope:**
  APPR MODE ....ARM/ CHECK ARMED | PF
  LOC..................CHECK ENGAGED | PF
  FCU ALTITUDE.................. SET ABOVE A/C ALTITUDE | PF
  V/S MODE..................SELECT | PF

L2 *Select V/S 1 500 ft/min initially. V/S in excess of 2 000 ft/min will result in the speed increasing towards VFE.*

Ident.: PRO-NOR-SOP-18-C-A-00014490.0001001 / 05 MAY 22

FINAL APPROACH

FLIGHT PARAMETERS..................MONITOR | PM

L2 *The PM calls out if excessive deviation occurs:*
- *LOC: ½ dot*
- *G/S: ½ dot.*

For additional information on the associated standard callouts, Refer to PRO-NOR-SCO Approach.

L1 AT 350 ft RA

LAND mode.................. CHECK ENGAGED/ANNOUNCE | PF

L2 *If no LAND mode, autoland is not authorized.*

L1 **FOR CAT I, CAT II, CAT III WITH DH APPROACH**

Note: LPV approach (with SLS ◁) are considered as approach with CAT 1 minima.

AT ENTERED MINIMUM +100 ft

ONE HUNDRED ABOVE..................MONITOR OR ANNOUNCE | PM

AT ENTERED MINIMUM

MINIMUM..................MONITOR OR ANNOUNCE | PM

Below minimum, the visual references must be the primary reference until landing. For more information regarding transition to visual references, *Refer to FCTM/PR-NP-SOP-250 Transition to Visual References*.

- **If visual references are sufficient:**
  CONTINUE..................ANNOUNCE | PF

AP.. AS RQRD | PF

L2 *For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function.*
For Manual Landing and Autoland procedure, Refer to PRO-NOR-SOP-19 Landing - Flare.

L1 ■ **If visual references are not sufficient:**

GO-AROUND.. ANNOUNCE | PF

L2 *Initiate a go-around.*

L1 **FOR CAT III WITHOUT DH APPROACH**

At 200 ft (Alert Height) if no failure

CONTINUE.. ANNOUNCE | PF

Ident.: PRO-NOR-SOP-18-C-A-00020959.0002001 / 03 NOV 22

MANAGEMENT OF DEGRADED GUIDANCE

EARLY/UNTIMELY FLARE MODE ENGAGEMENT

- Perform a go-around (thrust levers set to TOGA), or
- Disconnect AP, set both FDs to OFF and continue the approach using raw data or external visual references.

In association to an early/untimely FLARE mode engagement on the FMA, the following effects may occur:

- On the PFD:
  - The RA height indication may be frozen at a positive or negative value
  - Discrepancies between both PFDs may happen on the following indications:
    - RA heights
    - FD orders
    - FMA indications when both APs are engaged.
- Warnings and/or Callouts:
  - Untimely activation of the AUTOLAND warning (*Refer to DSC-22_30-80-10 AUTOLAND Light*)
  - Untimely TAWS alerts
  - Untimely or absence of “RETARD” callout
  - Untimely L/G GEAR NOT DOWN alert
  - Absence or interruption of RA automatic callout (height announcement).
- On the SD: A pulsing cabin differential pressure advisory may appear on the CAB PRESS SD page.

Note: *This ECAM advisory has no consequence on the real cabin pressure.*

FOR CAT II, CAT III APPROACHES:

- **Apply the following strategy in the case of:**
  - Amber caution (single chime), or
  - Landing capability degradation below the approach category defined during the briefing.

- **Above 1 000 ft AGL:**

ECAM/QRH PROCEDURE	COMPLETE	BOTH
APPROACH AND LANDING CAPABILITY	CHECK	BOTH
REQUIRED EQUIPMENT	CHECK	PM

L2 *For more information, Refer to QRH/OPS Required Equipment for CAT2 and CAT3.*

L1

- **If required:**

RVR	CHECK	PM
DH	ADJUST	PM
ARRIVAL BRIEFING	UPDATE	BOTH

- **If the flight crew does not complete all the above actions at 1 000 ft:**

GO-AROUND	PERFORM	PF

- **Below 1 000 ft AGL:**
- **If external visual references are not sufficient:**

GO-AROUND	PERFORM	PF

- **Below 200 ft (Alert Height) for CAT3 DUAL:**

The automatic approach may be continued unless the AUTOLAND warning is triggered.

- **In the case of AUTOLAND warning:**
  - **If visual references are not sufficient:**

GO-AROUND	PERFORM	PF

  - **If visual references are sufficient:**

The approach may be continued manually.

APPROACH USING FINAL APP GUIDANCE

Ident.: PRO-NOR-SOP-18-C-C-00014511.0003001 / 01 MAR 18
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

The following items are to be performed in addition to previous SOP chapters in the following cases:
- RNAV(GNSS) approaches with LNAV and LNAV/VNAV minima
- Conventional approaches based on VOR or NDB using FINAL APP guidance.

Note: *For RNAV(RNP), Refer to Approach using FINAL APP Guidance for RNAV(RNP) - General.*

Ident.: PRO-NOR-SOP-18-C-C-00014511.0002001 / 29 MAY 13
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

GENERAL

The following items are to be performed in addition to previous SOP chapters in the following cases:
- RNAV(GNSS) approaches with LNAV and LNAV/VNAV minima
- Conventional approaches based on VOR or NDB using FINAL APP guidance.

Ident.: PRO-NOR-SOP-18-C-C-00014512.0003001 / 09 SEP 14
Applicable to: ALL

AIRCRAFT EQUIPMENT

For RNAV(GNSS) approaches, *Refer to PRO-SPO-51 RNP APCH / RNAV(GNSS) - Required RNP APCH Equipment*

Ident.: PRO-NOR-SOP-18-C-C-00015664.0001001 / 09 SEP 14
Applicable to: ALL

FLIGHT PREPARATION

For RNAV(GNSS) approaches, GPS PRIMARY availability should be confirmed.
Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

Ident.: PRO-NOR-SOP-18-C-C-00014514.0002001 / 09 NOV 21
Applicable to: ALL

DESCENT PREPARATION

WEATHER AND LANDING INFORMATION....................OBTAIN | PM

L2 - *The FMS vertical profile does not take into account the effect of low OAT. Therefore, vertical managed guidance:*

- *Must not be used when the actual OAT is below the minimum temperature indicated on the approach chart or defined by the Operator, or*
- *May not be used when temperature corrections are required (FINAL APP mode may not engage)*

- *For RNAV (GNSS) approach with LNAV VNAV minima, use of QNH from a remote station is prohibited.*

L1 F-PLN A page....................CHECK | PF-PM

L2 - *If a TOO STEEP PATH is displayed after the FDP, do not use FINAL APP guidance for approach. Use NAV FPA, TRK FPA or FLS for approach*
- *0.1 degree of difference between the MCDU and the charted final vertical path is acceptable*
- *1 degree of difference between the MCDU and the charted final lateral track is acceptable.*

Note: *A higher lateral track value can be acceptable if the navigation database has been validated to exclude potential coding error*

- *3 degree of difference between the MCDU and the charted final lateral track is acceptable for conventional radio NAVAID approach.*

L1 PROG page....................COMPLETE | PF-PM

L2 *Insert the reference RWY threshold in the BRG/DIST field for position monitoring during approach.*

L1 GO-AROUND STRATEGY....................REVIEW | PF

L2 *The briefing should include a review of the "Management of Degraded Navigation" chapter.*

Ident.: PRO-NOR-SOP-18-C-C-00014515.0003001 / 24 NOV 23
Applicable to: ALL

DESCENT

At 10 000 ft AAL:

NAV ACCURACY....................CHECK | PF

L2 *If NAV accuracy is LOW, use TRK FPA mode for approach (Refer to PRO-NOR-SOP-18-C Approach using FPA Guidance - General).*

L1 ● **For RNAV(GNSS) approach:**

GPS PRIMARY.............................CHECK | PF

L2 *GPS PRIMARY must be available on at least one FMS.*

L1 BAROMETRIC REFERENCE.............................SET/CROSSCHECK | PF-PM

L2 *The vertical guidance requires a precise BARO setting. The maximum acceptable difference between altimeters is 100 ft.*

Ident.: PRO-NOR-SOP-18-C-C-00014516.0002001 / 24 NOV 23
Applicable to: ALL

INITIAL/INTERMEDIATE/FINAL APPROACH

POSITION.............................MONITOR | PF

L2 *Check that ATC clearances enable the aircraft to fly through the capture area of the vertical profile. After a radar vectoring, consider a DIR TO RDL IN to sequence the F-PLN.*

L1 APPR pb on FCU.............................PRESS | PF

L2 *Press the APPR pb when all of the following conditions are satisfied:*
- *The aircraft is cleared for approach*
- *TO waypoint is the FDP.*

L1 APP NAV.............................CHECK ARMED or ENGAGED | PF
FINAL.............................CHECK ARMED | PF

L2
- *Check that the VDEV scale is displayed on the PFD*
- *At the FDP, a blue arrow on ND indicates that FINAL APP engagement conditions are satisfied.*

L1

At Final Descent Point:

FINAL APP.............................CHECK ENGAGED | PF
GO-AROUND ALTITUDE.............................SET | BOTH
FLIGHT PARAMETERS.............................MONITOR | PM

L2
- *Monitor XTK error on ND*
- *Monitor VDEV on PFD*
- *Check altitude crossing at FAF and waypoints of the final approach, as published on the chart*

- *If approaching on a conventional radio NAVAID procedure, monitor the lateral and vertical guidance using raw data*
- *The PM calls out if excessive deviation occurs:*
  - *XTK > 0.1 NM*
  - *VDEV > ½ dot*
    On the vertical scale, one dot corresponds to 100 ft. Therefore ½ dot is 50 ft.

For additional information on the associated standard callouts, Refer to PRO-NOR-SCO Flight Parameters in Approach.

Ident.: PRO-NOR-SOP-18-C-C-00014849.0001001 / 09 NOV 21
Applicable to: ALL

AT ENTERED MINIMUM +100 FT

ONE HUNDRED ABOVE..MONITOR OR ANNOUNCE | PM

Ident.: PRO-NOR-SOP-18-C-C-00014517.0008001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

AT ENTERED MINIMUM

MINIMUM...MONITOR OR ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary reference until landing.*
For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.

L1 ■ **If visual references are sufficient:**

CONTINUE.. ANNOUNCE | PF

At the latest at the MAP or Minimum Use Height of the AP (whichever occurs first):

AP..OFF | PF

L2
- *For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function*
- *At minimum -50 ft, if the AP is still engaged, the message DISCONNECT AP FOR LDG pulses on the FMA to remind the flight crew that automatic landing is not available.*

L1 FD.. AS RQRD | PF

CAUTION	- *From minima down to the MAP, the FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed* - *After the MAP, disregard the FD as it reverts to HDG V/S.*

■ **If visual references are not sufficient:**

GO-AROUND...ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-C-00014517.0006001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

AT ENTERED MINIMUM

MINIMUM..MONITOR OR ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary reference until landing.*
For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.

L1 ■ **If visual references are sufficient:**

CONTINUE.. ANNOUNCE | PF

At the latest at the MAP or Minimum Use Height of the AP (whichever occurs first):

AP...OFF | PF

L2
- *For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function*
- *The AP will automatically disengage at the MAP*
- *At minimum -50 ft, if the AP is still engaged, the message DISCONNECT AP FOR LDG pulses on the FMA to remind the flight crew that automatic landing is not available.*

L1 FD.. AS RQRD | PF

CAUTION	- *From minima down to the MAP, the FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed* - *After the MAP, disregard the FD as it reverts to HDG V/S.*

■ **If visual references are not sufficient:**

GO-AROUND...ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-C-00014517.0002001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP

AT ENTERED MINIMUM

MINIMUM..MONITOR OR ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary reference until landing.*
For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.

L1 ■ **If visual references are sufficient:**

CONTINUE.. ANNOUNCE | PF

AP..OFF | PF

L2 *The AP will automatically disengage under the following conditions, depending on which one occurs first:*
- *At minimum -50 ft (if entered) or at 400 ft AGL (if no minimum is entered), or*
- *At the MAP.*

L1 FD..OFF | PM

L2 *The PF orders the PM to set both FDs off.*

L1 TRK FPA...SELECT | PF
RUNWAY TRACK...................................CHECK/SET | PM

L2 *If needed, the PF orders the PM to set the runway track.*

L1 ■ **If visual references are not sufficient:**
GO-AROUND..ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-C-00014518.0002001 / 03 NOV 21
Applicable to: ALL

MANAGEMENT OF DEGRADED NAVIGATION

- **For VOR and NDB approaches, be prepared to continue the approach with reference to appropriate raw data by reverting to:**
  - NAV-FPA, if the vertical guidance is not satisfactory
  - TRK-FPA, if the lateral guidance is not satisfactory.
- **For RNAV(GNSS) approaches with LNAV minima:**
  - Use the appropriate remaining AP/FD in the following cases:
    - GPS PRIMARY LOST on one ND
    - NAV ACCUR DOWNGRAD on one ND.
  - Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:
    - GPS PRIMARY LOST on both NDs
    - XTK > 0.3 NM
    - NAV FM/GPS POS DISAGREE
    - NAV ACCUR DOWNGRAD on both NDs.
  - Be prepared to continue the approach by reverting to NAV-FPA, if the vertical guidance is not satisfactory.

- **For RNAV(GNSS) approaches with LNAV/VNAV minima:**
  - Use the appropriate remaining AP/FD in the following cases:
    - GPS PRIMARY LOST on one ND
    - NAV ACCUR DOWNGRAD on one ND.
  - Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:
    - GPS PRIMARY LOST on both NDs
    - XTK > 0.3 NM
    - NAV FM/GPS POS DISAGREE
    - NAV ACCUR DOWNGRAD on both ND.
  - Discontinue the approach in the case of deviation of 75 ft below the vertical path (V/DEV > ¾ dot).

APPROACH USING FINAL APP GUIDANCE FOR RNAV(RNP)

Ident.: PRO-NOR-SOP-18-C-D-00014542.0002001 / 29 MAY 13
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

The following items are to be performed in addition to previous SOP chapters in case of RNAV(RNP) approaches.
The procedures of the paragraph below are generic guidelines for RNAV(RNP) approaches. These procedures may be tailored by the airline for specific airfields according to their OPS approval.

Ident.: PRO-NOR-SOP-18-C-D-00014543.0002001 / 01 MAR 18
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

AIRCRAFT EQUIPMENT

Refer to PRO-SPO-51 RNP AR / RNAV(RNP) - General

Ident.: PRO-NOR-SOP-18-C-D-00014544.0002001 / 29 MAY 13
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

FLIGHT PREPARATION

Use a prediction tool to check the GPS PRIMARY availability for the estimated time of operation. It ensures that the RNP criteria will be met during approach. This prediction should take into account the terrain environment.

Ident.: PRO-NOR-SOP-18-C-D-00014546.0002001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

DESCENT PREPARATION

WEATHER AND LANDING INFORMATION...OBTAIN | PM

L2
- *The FMS vertical profile does not take into account the effect of low OAT. Therefore, vertical managed guidance:*
  - *Must not be used when the actual OAT is below the minimum temperature indicated on the approach chart or defined by the Operator, or*
  - *May not be used when temperature corrections are required (FINAL APP mode may not engage)*
- *Verify that wind is within limits*
- *Use of QNH from a remote station is prohibited.*

L1 F-PLN A page...CHECK | PF-PM

L2 *If a TOO STEEP PATH is displayed after the FDP, FINAL APP guidance cannot be used. Select another approach.*

L1 PROG page...COMPLETE | PF-PM

L2
- *Insert the reference waypoint or RWY threshold in the BRG/DIST field for position monitoring during approach*
- *Check/Insert the RNP value in the 6L field.*

L1 GO-AROUND STRATEGY...REVIEW | PF

L2 *The briefing should include a review of the “Management of Degraded Navigation” chapter.*

Ident.: PRO-NOR-SOP-18-C-D-00014547.0002001 / 24 FEB 23
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

DESCENT

GPS PRIMARY ON BOTH FMS...CHECK | PF

L2 *For RNAV(RNP) approaches, GPS PRIMARY must be available on both FMS (GPS PRIMARY LOST is not displayed on NDs).*

L1 GPS 1+2...CHECK both in NAV or SBAS ◁ | PF

L2
- *Both GPS must be in NAV or SBAS ◁ on the GPS MONITOR page*
- *Both GPS and both FMS must be available, before the IAF. Therefore, if one FMS is inoperative or if one GPS is not in NAV or SBAS ◁ before the IAF, RNAV(RNP) is not permitted.*

L1 TERR ON ND...ON | PF-PM

L2 *Unless weather radar is required on one side, the flight crew selects terrain on both NDs.*

Ident.: PRO-NOR-SOP-18-C-D-00014548.0006001 / 24 NOV 23
Applicable to: LV-KAN, LV-KAO

INITIAL / INTERMEDIATE / FINAL APPROACH

BAROMETRIC REFERENCE....................SET/CROSSCHECK | PF-PM

L2 *The vertical guidance requires a precise BARO setting. The maximum acceptable difference between altimeters is 100 ft.*

L1 FD or AP/FD....................USE FOR APPROACH | PF

L2
- *The use of FD or AP/FD provides the required navigation accuracy.* *Refer to LIM-AFS-10 Use of NAV Mode - Approach Based on Radio Navaids*
- *For operations with RNP below 0.3 NM, one AP must be engaged.*

L1 L/DEV....................CHECK DISPLAYED | PF

L2 *Check that the L/DEV scale is displayed on the PFD.*

L1 APPR pb on FCU....................PRESS | PF

L2 *Press the APPR pb when all of the following conditions are satisfied:*
- *The aircraft is cleared for approach*
- *TO waypoint is the final descent point.*

L1 APP NAV....................CHECK ARMED or ENGAGED | PF
FINAL....................CHECK ARMED | PF

L2
- *Check that the V/DEV scale is displayed on the PFD*
- *At the VIP, a blue arrow on ND indicates that FINAL APP engagement conditions are met.*

L1

At the Final Descent Point:

FINAL APP....................CHECK ENGAGED | PF
GO-AROUND ALTITUDE....................SET | BOTH
FLIGHT PARAMETERS....................MONITOR | PM

L2
- *Monitor L/DEV on PFD and XTK on ND*
- *Monitor V/DEV on PFD*
- *Check altitude crossing at FAF and waypoints of the final, as published on the chart*

- *The PM calls out if excessive deviation occurs:*
  - *L/DEV reaches ½ dot*
  - *V/DEV reaches ½ dot.*
    On the vertical scale, one dot corresponds to 100 ft. Therefore, ½ dot is 50 ft.

  Refer to PRO-NOR-SCO Approach
- *Go-around must be initiated if excessive deviation occurs:*
  - *L/DEV reaches 1 RNP*
  - *V/DEV reaches ¾ dot below the vertical profile.*
    On the vertical scale, one dot corresponds to 100 ft. Therefore, ¾ dot is 75 ft.

Ident.: PRO-NOR-SOP-18-C-D-00014548.0003001 / 24 NOV 23
Applicable to: LV-KHT, LV-KHU

INITIAL / INTERMEDIATE / FINAL APPROACH

BAROMETRIC REFERENCE....................SET/CROSSCHECK | PF-PM

L2 *The vertical guidance requires a precise BARO setting. The maximum acceptable difference between altimeters is 100 ft.*

L1 FD or AP/FD....................USE FOR APPROACH | PF

L2 *The use of FD or AP/FD provides the required navigation accuracy. Refer to LIM-AFS-10 Use of NAV Mode - Approach Based on Radio Navaids.*

L1 APPR pb on FCU....................PRESS | PF

L2 *Press the APPR pb when all of the following conditions are satisfied:*
- *The aircraft is cleared for approach*
- *TO waypoint is the final descent point.*

L1 APP NAV....................CHECK ARMED or ENGAGED | PF
FINAL....................CHECK ARMED | PF

L2
- *Check that the V/DEV scale is displayed on the PFD.*
- *At the VIP, a blue arrow on ND indicates that FINAL APP engagement conditions are met.*

L1

At the Final Descent Point:

FINAL APP....................CHECK ENGAGED | PF
GO-AROUND ALTITUDE....................SET | BOTH
FLIGHT PARAMETERS....................MONITOR | PM

L2
- *Monitor XTK on ND*
- *Monitor V/DEV on PFD*
- *Check altitude crossing at FAF and waypoints of the final, as published on the chart*

- *The PM calls out if excessive deviation occurs:*
  - *XTK reaches 0.1 NM*
  - *V/DEV reaches ½ dot.*
    On the vertical scale, one dot corresponds to 100 ft. Therefore, ½ dot is 50 ft.

  Refer to PRO-NOR-SCO Approach
- *Go around must be initiated if excessive deviation occurs:*
  - *XTK reaches 1 RNP*
  - *V/DEV reaches ¾ dot below the vertical profile.*
    On the vertical scale, one dot corresponds to 100 ft. Therefore, ¾ dot is 75 ft.

Ident.: PRO-NOR-SOP-18-C-D-00014850.0001001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

AT ENTERED MINIMUM +100 FT

ONE HUNDRED ABOVE..MONITOR OR ANNOUNCE | PM

Ident.: PRO-NOR-SOP-18-C-D-00014549.0009001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO

AT ENTERED MINIMUM

MINIMUM...MONITOR or ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary reference until landing.*

L1 ■ **If visual references are sufficient:**

CONTINUE...ANNOUNCE | PF

At the latest at the MAP or Minimum Use Height of the AP (whichever occurs first):

AP...OFF | PF

L2
- *For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function*
- *At minimum -50 ft, if the AP is still engaged, the message DISCONNECT AP FOR LDG pulses on the FMA to remind the flight crew that automatic landing is not available.*

L1 FD..AS RQRD | PF

CAUTION	- *From minima down to the MAP, the FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed* - *After the MAP, disregard the FD as it reverts to HDG V/S.*

■ **If visual references are not sufficient:**

GO-AROUND...ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-D-00014549.0006001 / 09 NOV 21
Applicable to: LV-KHT, LV-KHU

AT ENTERED MINIMUM

MINIMUM.......................................MONITOR or ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary reference until landing.*

L1 ■ **If visual references are sufficient:**

CONTINUE.......................................ANNOUNCE | PF

At the latest at the MAP or Minimum Use Height of the AP (whichever occurs first):

AP.......................................OFF | PF

L2
- *For Minimum Use Height of the AP, Refer to LIM-AFS-10 Autopilot Function*
- *The AP will automatically disengage at the MAP*
- *At minimum -50 ft, if the AP is still engaged, the message DISCONNECT AP FOR LDG pulses on the FMA to remind the flight crew that automatic landing is not available.*

L1 FD.......................................AS RQRD | PF

CAUTION	- *From minima down to the MAP, the FD provides an additional guidance. The FD must be switched off if the guidance is not relevant or not followed* - *After the MAP, disregard the FD as it reverts to HDG V/S.*

■ **If visual references are not sufficient:**

GO-AROUND.......................................ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-D-00014550.0002001 / 25 JAN 17
Applicable to: LV-KAN, LV-KAO

MANAGEMENT OF DEGRADED NAVIGATION

The approach may be continued in case of single failure of:
- GPS (MMR)
- FMGS
- EFIS DU
- MCDU
- AP

Discontinue the approach in the following cases:
- FINAL APP does not engage
- GPS PRIMARY LOST on both NDs
- Dual NAV ACCUR DOWNGRAD
- FM/GPS POSITION DISAGREE
- FMS1/FMS2 POS DIFF

- Dual loss of FMGC or dual loss of FINAL APP mode
- Dual AP failure if the RNP < 0.3 NM
- Loss of GPWS TERRAIN function in case of inconsistencies affecting obstacles or terrain computation
- NAV ALT DISCREPANCY

Ident.: PRO-NOR-SOP-18-C-D-00014550.0003001 / 25 JAN 17
Applicable to: LV-KHT, LV-KHU

MANAGEMENT OF DEGRADED NAVIGATION

The approach may be continued in case of single failure of:
- GPS (MMR)
- FMGS
- EFIS DU
- MCDU
- AP

Discontinue the approach in the following cases:
- FINAL APP does not engage
- GPS PRIMARY LOST on both NDs
- Dual NAV ACCUR DOWNGRAD
- FM/GPS POSITION DISAGREE
- FMS1/FMS2 POS DIFF
- Dual loss of FMGC or dual loss of FINAL APP mode
- Loss of GPWS TERRAIN function in case of inconsistencies affecting obstacles or terrain computation
- NAV ALT DISCREPANCY

APPROACH USING FPA GUIDANCE

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-E-00014526.0001001 / 24 NOV 23

GENERAL

The following items are to be performed in addition to previous SOP chapters in the following cases:
- RNAV(GNSS) approaches with LNAV minima using mixed NAV FPA guidance
- RNAV(GNSS) approaches with LP minima (with SLS ◁) using mixed LOC FPA guidance
- Conventional approaches based on VOR and NDB using selected TRK FPA or mixed NAV FPA guidance
- ILS G/S OUT, LOC ONLY and LOC B/C approaches.

The approach is flown in TRK FPA when:
- The approach is not stored in the database, or
- NAV accuracy is LOW.

Ident.: PRO-NOR-SOP-18-C-E-00014527.0002001 / 09 SEP 14

AIRCRAFT EQUIPMENT

For RNAV(GNSS) approaches, *Refer to PRO-SPO-51 RNP APCH / RNAV(GNSS) - Required RNP APCH Equipment*

Ident.: PRO-NOR-SOP-18-C-E-00015665.0001001 / 09 SEP 14

FLIGHT PREPARATION

For RNAV(GNSS) approaches, GPS PRIMARY availability should be confirmed.
Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

Ident.: PRO-NOR-SOP-18-C-E-00014529.0001001 / 09 NOV 21

DESCENT PREPARATION

F-PLN A page.. CHECK | PF-PM

L2
- *If a TOO STEEP PATH message is displayed after the FDP, disregard the V/DEV or yoyo information on the PFD*
- *For approaches using NAV FPA:*
  - *1 degree of difference between the MCDU and the charted final lateral track is acceptable.*

    Note: A higher lateral track value can be acceptable if the navigation database has been validated to exclude potential coding error
  - *3 degree of difference between the MCDU and the charted final lateral track is acceptable for conventional radio NAVAID approach.*

L1 PROG page..COMPLETE | PF-PM

L2 *Insert the reference RWY threshold in the BRG/DIST field for position monitoring during approach.*

L1 GO-AROUND STRATEGY.. REVIEW | PF

L2 *The briefing should include a review of the “Management of Degraded Navigation” chapter.*

Ident.: PRO-NOR-SOP-18-C-E-00014530.0002001 / 24 NOV 23

DESCENT

At 10 000 ft AAL:

NAV ACCURACY..CHECK | PF

L2 *If NAV accuracy is LOW, use TRK mode for approach.*

L1 ● **For RNAV(GNSS) approach:**
GPS PRIMARY............CHECK | PF

L2 *GPS PRIMARY must be available on at least one FMS.*

L1 BAROMETRIC REFERENCE............SET/CROSSCHECK | PF-PM

L2 *The vertical guidance requires a precise BARO setting.*

Ident.: PRO-NOR-SOP-18-C-E-00014531.0001001 / 24 NOV 23

INITIAL/INTERMEDIATE/FINAL APPROACH

LATERAL GUIDANCE MODE ....SET FOR APPROACH | PF

L2 *Arm NAV, LOC or LOC B/C mode as appropriate.*

L1 ● **For LOC ONLY, ILS G/S OUT, LOC B/C, or LP (with SLS ◁) approaches:**
LOC pb-sw ....PRESS | PF

L2 *Press the LOC pb-sw when:*
- *Cleared for the approach*
- *On the intercept trajectory for the final approach course*
- *LOC deviation is available.*

L1 *Note:* *In NAV mode, the aircraft may leave the F-PLN to capture the LOC.*

LOC(LOC B/C)............CHECK ARMED | PF

L2 *For back course localizer approach, Refer to FCTM/PR-NP-SOP-190-GUI Back Course Localizer Approach.*

L1 LATERAL PATH............INTERCEPT | PF

L2 *Monitor NAV, LOC or LOC B/C engagement as appropriate.*

L1 TRK-FPA pb (Bird)............SELECT | PF
FPA FOR FINAL APPROACH............SET | PF

At 0.3 NM from the Final Descent Point:

FPA selector ....PULL | PF
FPA MODE............CHECK ENGAGED | PF

L2 *Check that NAV FPA, TRK FPA, LOC FPA or LOC B/C FPA is engaged.*

L1 POSITION/FLIGHT PATH............MONITOR/ADJUST | PF
GO-AROUND ALTITUDE............SET | BOTH

L2 *Set when below the go-around altitude to avoid not expected altitude capture.*

L1 FLIGHT PARAMETERS....................MONITOR | PM

L2
- *Crosscheck distances versus altitudes as published on the charts*
- *If approaching on a conventional radio NAVAID procedure, monitor the lateral and vertical guidance using raw data.*
- *For approaches using NAV FPA, monitor XTK error on ND to check the lateral guidance*
- *The PM calls out if excessive lateral deviation occurs:*
  - *Approach using NAV mode: XTK is more than 0.1 NM*
  - *Approach using LOC or LOC B/C mode: LOC ½ dot*
  - *Approach using TRK mode:*
    - *VOR: ½ dot or 2.5 °*
    - *NDB: 5 °.*

Refer to PRO-NOR-SCO Flight Parameters in Approach.

Ident.: PRO-NOR-SOP-18-C-E-00014851.0001001 / 09 NOV 21

AT ENTERED MINIMUM +100 FT

ONE HUNDRED ABOVE....................MONITOR OR ANNOUNCE | PM

Ident.: PRO-NOR-SOP-18-C-E-00014532.0005001 / 09 NOV 21

AT ENTERED MINIMUM

MINIMUM....................MONITOR OR ANNOUNCE | PM

L2 *Below minimum, the visual references must be the primary reference until landing. For more information regarding transition to visual references, Refer to FCTM/PR-NP-SOP-250 Transition to Visual References.*

L1 ■ **If visual references are sufficient:**

CONTINUE....................ANNOUNCE | PF

AP....................OFF | PF

L2 *At minimum -50 ft, if the AP is still engaged, the message DISCONNECT AP FOR LDG pulses on the FMA to remind the flight crew that automatic landing is not available.*

L1 FD....................OFF | PM

L2 *The PF orders the PM to set both FDs off.*

L1 RUNWAY TRACK....................CHECK/SET | PM

L2 *If needed, the PF orders the PM to set the runway track.*

L1 ■ **If visual references are not sufficient:**

GO-AROUND....................ANNOUNCE | PF

L2 *Initiate a go-around.*

Ident.: PRO-NOR-SOP-18-C-E-00014533.0001001 / 03 NOV 21

MANAGEMENT OF DEGRADED NAVIGATION

- **For VOR and NDB approaches in NAV-FPA, if the lateral guidance is not satisfactory:**
  - Be prepared to continue the approach with reference to appropriate raw data by reverting to TRK-FPA.
- **For RNAV(GNSS) approaches with LNAV minima:**
  - Use the appropriate remaining AP/FD in the following cases:
    - GPS PRIMARY LOST on one ND
    - NAV ACCUR DOWNGRAD on one ND.
  - Discontinue the approach in the following cases, if external visual references are not sufficient to proceed visually:
    - GPS PRIMARY LOST on both NDs
    - XTK > 0.3 NM
    - NAV FM/GPS POS DISAGREE
    - NAV ACCUR DOWNGRAD on both NDs.

CIRCLING APPROACH

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-F-00014502.0001001 / 29 MAY 13

GENERAL

The circling approach is the visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight-in approach.

CAUTION	The flight crew must conduct the flight within the circling area, while maintaining required visual references at all times.

Ident.: PRO-NOR-SOP-18-C-F-00014503.0001001 / 24 NOV 23

APPROACH PREPARATION

For a circling approach, the approach preparation should include the following additional items in the FMS programming:

F-PLN

INSTRUMENT APPROACH....................INSERT | PF

L2 *On the ARRIVAL page, insert the instrument approach preceding the circling.*

L1 F SPEED CONSTRAINT AT FAF....................INSERT | PF

L2 *Insert F speed as constraint at FAF since the circling approach will be flown in CONF 3, landing gear down and F speed.*

L1 SEC F-PLN

F-PLN....................COPY ACTIVE | PF

L2 *On the SEC INDEX page, select COPY ACTIVE in order to make a copy of the active F-PLN.*

L1 LANDING RUNWAY....................REVISE | PF

L2
- *On the SEC F-PLN ARRIVAL page, insert the appropriate landing runway*
- *Keep the F-PLN discontinuity.*

Ident.: PRO-NOR-SOP-18-C-F-00014504.0001001 / 24 NOV 23

INSTRUMENT APPROACH

The flight crew flies an early stabilized approach at F speed, configuration 3 and landing gear down.

Ident.: PRO-NOR-SOP-18-C-F-00014505.0001001 / 24 NOV 23

CIRCLING APPROACH

- **At the Circling MDA(H) at the latest:**
  LEVEL OFF....................PERFORM | PF
- **At MAP, if the flight crew does not obtain required visual references:**
  GO AROUND....................PERFORM | PF
- **If the flight crew obtains required visual references:**
  TRK FPA....................SELECT | PF

  L2 *Select a track 45 ° away from the final approach course (or as required by the published procedure).*

  L1
  - **When wings are level:**
    CHRONO....................START | PF
  - **After 30 s:**
    DOWNWIND TRACK....................SELECT | PF

    L2 *Select the downwind track parallel to the landing runway.*

L1
- **During the downwind leg:**

  ACTIVATE SEC F-PLN.. ORDER | PF
  SEC F-PLN.. ACTIVE | PM

  - **When the aircraft is abeam the landing runway threshold:**

    CHRONO.. START | PM

L2 *The time from abeam threshold to the beginning of the base turn depends on the height above touchdown approximately 3 s/100 ft.*

L1 BASE TURN.. PERFORM | PF

L2 *Initially maintain 25 ° bank angle and maintain the altitude until the visual references for the intended runway are distinctly visible and identifiable.*

L1
- **When appropriate:**

  FLAPS FULL.. ORDER | PF
  FLAPS FULL.. SELECT | PM

- **When the aircraft is fully configured for landing:**

  LANDING C/L.. COMPLETE | PF-PM

- **At the latest before starting the descent toward the runway:**

  AP.. OFF | PF
  FDs OFF.. ORDER | PF
  FDs.. OFF | PM

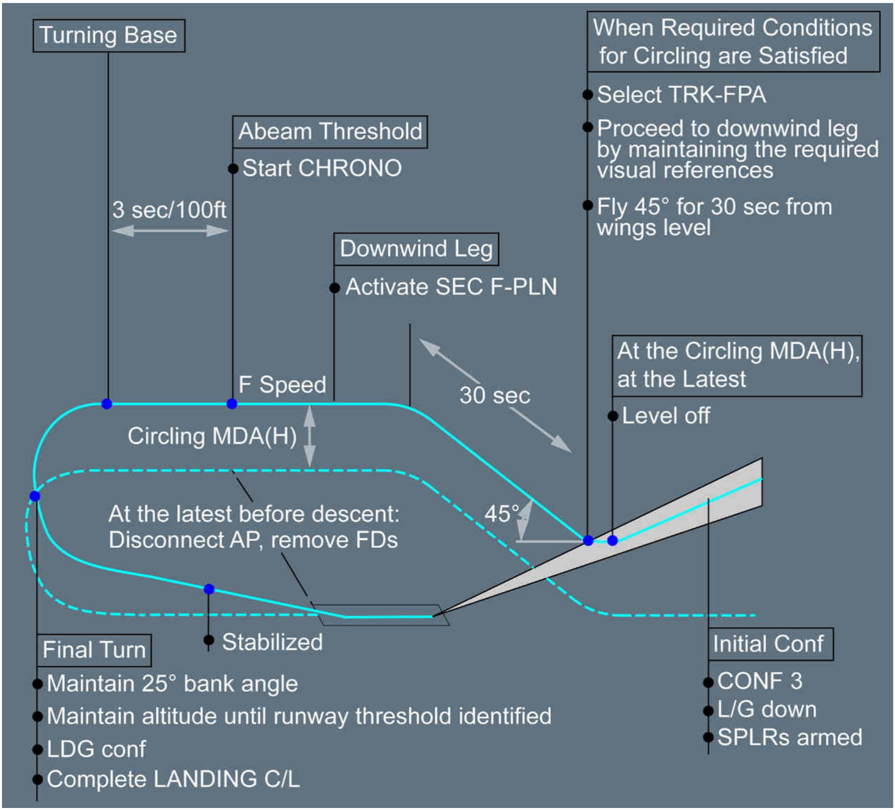
- **At anytime during the circling procedure, if the required visual references are lost:**

  GO AROUND.. PERFORM | PF

L2 *Initiate a go-around following the missed approach of the initial instrument approach (unless otherwise specified).*

Ident.: PRO-NOR-SOP-18-C-F-00014506.0001001 / 24 NOV 23

CIRCLING APPROACH PATTERN


Turning Base
When Required Conditions for Circling are Satisfied
Select TRK-FPA
Proceed to downwind leg by maintaining the required visual references
Fly 45° for 30 sec from wings level
Abeam Threshold
Start CHRONO
3 sec/100ft
Downwind Leg
Activate SEC F-PLN
F Speed
30 sec
At the Circling MDA(H), at the Latest
Level off
Circling MDA(H)
45°
At the latest before descent: Disconnect AP, remove FDs
Final Turn
Maintain 25° bank angle
Maintain altitude until runway threshold identified
LDG conf
Complete LANDING C/L
Stabilized
Initial Conf
CONF 3
L/G down
SPLRs armed

RNAV VISUAL APPROACH

Applicable to: ALL

Ident.: PRO-NOR-SOP-18-C-G-00015946.0001001 / 23 DEC 14

GENERAL

The aircraft navigates using the RNAV system, but the position is monitored by visual reference to the ground, obstacles and other traffic.
RNAV visual approach must be stored and retrievable from the Navigation Database.

Ident.: PRO-NOR-SOP-18-C-G-00015947.0001001 / 23 DEC 14

EQUIPMENT REQUIRED

- 1 FMS
- 1 GPS or 2 DME to update FM position
- Additional requirement if indicated on the approach chart.

Ident.: PRO-NOR-SOP-18-C-G-00015949.0001001 / 17 MAR 17

FMGEC GUIDANCE MODE

- **If no required accuracy is published:**

  The use of FMGEC guidance mode is at flight crew discretion.

- **If RNAV 1 or RNP 1 is required on the published approach chart:**

  The flight crew should use adequate FMGEC guidance modes.

Note: *The use of lateral and vertical managed guidance modes reduces the crew workload and improves energy management.*

For RNAV VISUAL approach including RF legs, *Refer to FCTM/PR-NP-SP-30 General*for RF leg flying technic.

Ident.: PRO-NOR-SOP-18-C-G-00015950.0001001 / 23 DEC 14

DESCENT PREPARATION

For approach data insertion in the FMS, keep the BARO/MDA field empty on the PERF APPR Page.

Ident.: PRO-NOR-SOP-18-C-G-00015951.0001001 / 23 DEC 14

DESCENT

For RNAV VISUAL approaches requiring GPS, check that GPS PRIMARY is available on at least 1 FMS.

Ident.: PRO-NOR-SOP-18-C-G-00015952.0001001 / 21 MAR 17

FINAL APPROACH

The flight crew must disconnect the AP at the latest at the Minimum Use Height of the AP.
Refer to LIM-AFS-10 Autopilot Function

VISUAL APPROACH

Ident.: PRO-NOR-SOP-18-C-H-00014507.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

Perform the approach on a nominal 3 ° glideslope using visual references. Approach is to be stabilized by 500 ft AAL on the correct approach path, in the landing configuration, at VAPP.

Method:
- The autopilot is not used
- Both FDs are OFF
- The use of FPV is recommended
- The use of A/THR is recommended with managed speed.

Keep in mind the possible risk of optical illusions due to hindered night vision.

Ident.: PRO-NOR-SOP-18-C-H-00014507.0003001 / 24 NOV 23
Applicable to: LV-GKO, LV-GKP

GENERAL

Perform the approach on a nominal 3 ° glideslope using visual references. Approach is to be stabilized by 500 ft AAL on the correct approach path, in the landing configuration, at VAPP.

Method:
- The autopilot is not used
- Both FDs are OFF
- The use of FPV is recommended
- The use of A/THR is recommended with managed speed.

Keep in mind the possible risk of optical illusions due to hindered night vision.

Note: *If the forecasted tailwind at landing is more than 10 kt decelerated approach is not allowed, and the speed should be stabilized around VREF + 5 kt in final.*

Ident.: PRO-NOR-SOP-18-C-H-00014508.0001001 / 08 AUG 13
Applicable to: ALL

INITIAL/INTERMEDIATE APPROACH

The flight plan selected on the MCDU should include the selection of the landing runway.
The downwind leg may also be part of the flight plan. This may be a useful indication of the aircraft position in the circuit on the ND.
However, visual references must be used.

Therefore, at the beginning of the downwind leg:
- Manually ACTIVATE APPR
- Select FDs to OFF
- Select TRK FPA to have FPV displayed
- Check A/THR active.
  Extend the downwind leg to 3 s/100 ft (±1 s/1 kt of headwind / tailwind).
  Turn into base leg with a maximum of 30 ° of bank. Descent with approximate FPA, in FLAPS 2, at "F" speed.

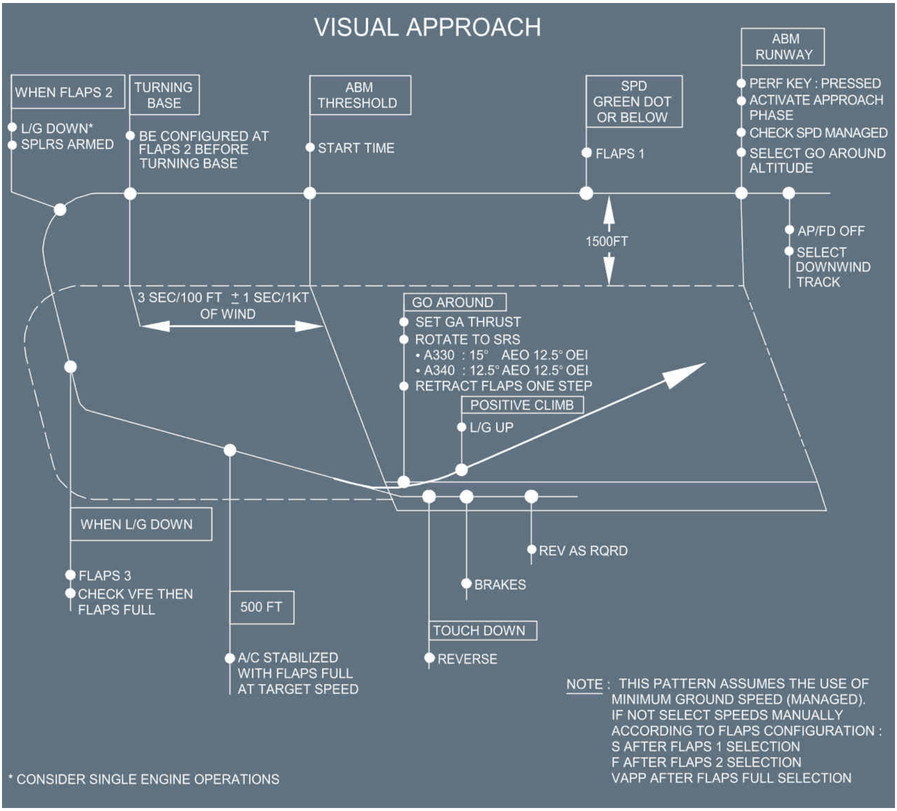
Ident.: PRO-NOR-SOP-18-C-H-00014509.0001001 / 24 NOV 23
Applicable to: ALL

FINAL APPROACH

The speed trend arrow and FPV help the flight crew make timely and correct thrust settings (if in manual thrust), and approach path corrections.
Avoid descent through the correct approach path with idle thrust (late recognition of this situation without a prompt thrust increase may lead to considerable speed decay and altitude loss).
Ensure that the aircraft is stabilized on the final descent path at VAPP (or ground speed mini) in the landing configuration with the thrust stabilized (usually above idle) at 500 ft AAL or as restricted by Operator policies/regulations.
If the aircraft is not stabilized, the flight crew must initiate a go around, unless they think that only small corrections are necessary to rectify minor deviations from stabilized conditions due, amongst others, to external perturbations.
Avoid any tendency to “duck under” in the late stages of the approach.
Avoid destabilizing the approach in the last 100 ft AGL, in order to have the best chance of performing a good touchdown at the desired position.

Ident.: PRO-NOR-SOP-18-C-H-00014510.0001001 / 17 JUN 16
Applicable to: ALL

VISUAL APPROACH PATTERN


VISUAL APPROACH
WHEN FLAPS 2
L/G DOWN*
SPLRS ARMED
TURNING BASE
BE CONFIGURED AT FLAPS 2 BEFORE TURNING BASE
ABM THRESHOLD
START TIME
SPD GREEN DOT OR BELOW
FLAPS 1
ABM RUNWAY
PERF KEY : PRESSED
ACTIVATE APPROACH PHASE
CHECK SPD MANAGED
SELECT GO AROUND ALTITUDE
AP/FD OFF
SELECT DOWNWIND TRACK
1500FT
3 SEC/100 FT ± 1 SEC/1KT OF WIND
GO AROUND
SET GA THRUST
ROTATE TO SRS
• A330 : 15° AEO 12.5° OEI
• A340 : 12.5° AEO 12.5° OEI
RETRACT FLAPS ONE STEP
POSITIVE CLIMB
L/G UP
WHEN L/G DOWN
FLAPS 3
CHECK VFE THEN FLAPS FULL
500 FT
A/C STABILIZED WITH FLAPS FULL AT TARGET SPEED
TOUCH DOWN
REVERSE
BRAKES
REV AS RQRD
NOTE : THIS PATTERN ASSUMES THE USE OF MINIMUM GROUND SPEED (MANAGED). IF NOT SELECT SPEEDS MANUALLY ACCORDING TO FLAPS CONFIGURATION :
S AFTER FLAPS 1 SELECTION
F AFTER FLAPS 2 SELECTION
VAPP AFTER FLAPS FULL SELECTION
* CONSIDER SINGLE ENGINE OPERATIONS

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MANUAL LANDING

Ident.: PRO-NOR-SOP-19-A-00024894.0001001 / 09 NOV 21
Applicable to: ALL

FOR MANUAL LANDING

AP	OFF	PF

Ident.: PRO-NOR-SOP-19-A-00012003.0022001 / 24 NOV 23
Applicable to: ALL

FLARE

- **AROUND 40 ft RA:**
  In stabilized approach, the flare height is approximately 40 ft.

FLARE	PERFORM	PF
ATTITUDE	MONITOR	PM
ALL THRUST LEVERS	IDLE	PF

L2 *Move the thrust levers to the IDLE detent, and begin a gentle progressive flare to enable the aircraft to touch down without a prolonged float.*
If the autothrust is engaged, it automatically disconnects when all the thrust levers are set to the IDLE detent.
At 20 ft, an automatic “RETARD” callout will trigger, as a reminder.

L1 *Note: Ground spoilers extension is inhibited if one or more thrust levers remain above the IDLE detent.*

Ident.: PRO-NOR-SOP-19-A-00012004.0014001 / 24 NOV 23
Applicable to: LV-GIF

AT TOUCHDOWN

- **As soon as the main landing gear touches down:**

DEROTATION	INITIATE	PF
ALL REVERSER LEVERS	REV MAX or REV IDLE	PF

L2 *The flight crew must select reverse thrust immediately after main landing gear touchdown.*

L1 *Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.*

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:
- *An emergency*
- *The deceleration is not as expected*
- *A failure affects the landing performance*

- *A long flare or a long touchdown*
- *An unexpected tailwind.*

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the flight crew can easily control this pitch up.

GND SPLRS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM WHEEL SD page displays the ground spoilers extended after touchdown*
- *If no ground spoilers are extended:*
  - *Check that all thrust levers are set to IDLE detent*
  - *Set both thrust reverser levers to MAX REV, and fully press the brake pedals.*

L1 *Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.*

REVERSERS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM E/WD page displays the expected reverser deployment (i.e. REV)*
- *If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.*

L1 DIRECTIONAL CONTROL....................ENSURE | PF

L2
- *Ensure directional control. Use the rudder pedals for directional control.*
- *During rollout, avoid sidestick inputs (either lateral or longitudinal)*
- *If the flight crew encounters directional control problem, they should reduce the thrust to REV IDLE until directional control is acceptable.*

L1 *Do not use the nosewheel steering control handle before reaching taxi speed.*

● **If autobrake is selected:**

AUTO BRK....................CHECK/ANNOUNCE | PM

L2 *Check and announce BRK LO or BRK MED on the FMA.*
If no ground spoilers are extended, the autobrake is not activated.

L1 AUTOBRAKE ....MONITOR | PM

L2 *During all the rollout, the PM monitors that the FMA displays BRK LO or BRK MED and calls out if the autobrake mode disengages.*

L1 ● **If landing without autobrake:**

BRAKES....................AS RQRD | PF

L2
- *Braking may begin before the nosewheel touches down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel touches down.*

L1 DECELERATION.. CHECK/ANNOUNCE | PM

L2 *The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.*

Ident.: PRO-NOR-SOP-19-A-00012004.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AT TOUCHDOWN

- **As soon as the main landing gear touches down:**
  DEROTATION.. INITIATE | PF

ALL REVERSER LEVERS...REV MAX or REV IDLE | PF

L2 *The flight crew must select reverse thrust immediately after main landing gear touchdown.*

L1 *Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.*

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:

- *An emergency*
- *The deceleration is not as expected*
- *A failure affects the landing performance*
- *A long flare or a long touchdown*
- *An unexpected tailwind.*

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the flight crew can easily control this pitch up.

GND SPLRS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM WHEEL SD page displays the ground spoilers extended after touchdown*
- *If no ground spoilers are extended:*
  - *Check that all thrust levers are set to IDLE detent*
  - *Set both thrust reverser levers to MAX REV, and fully press the brake pedals.*

L1 *Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.*

REVERSERS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM E/WD page displays the expected reverser deployment (i.e. REV)*
- *If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.*

L1 DIRECTIONAL CONTROL.. ENSURE | PF

L2
- *Ensure directional control. Use the rudder pedals for directional control.*
- *During rollout, avoid sidestick inputs (either lateral or longitudinal)*
- *If the flight crew encounters directional control problem, they should reduce the thrust to REV IDLE until directional control is acceptable.*

L1 *Do not use the nosewheel steering control handle before reaching taxi speed.*

● **If autobrake is selected:**

AUTOBRAKE .... MONITOR | PM

L2 *During all the rollout, the PM monitors the blue light on the autobrake panel and calls out if the autobrake mode disengages.*
If no ground spoilers are extended, the autobrake is not activated.

L1 ● **If landing without autobrake:**

BRAKES.. AS RQRD | PF

L2
- *Braking may begin before the nosewheel touches down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel touches down.*

L1 DECELERATION.. CHECK/ANNOUNCE | PM

L2 *The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.*

Ident.: PRO-NOR-SOP-19-A-00012007.0001001 / 28 NOV 23
Applicable to: ALL

AT 70 KNOTS

SEVENTY KNOTS... ANNOUNCE | PM
ALL REVERSER LEVERS... IDLE | PF

L2 *It is recommended to reduce reverse thrust when passing 70 kt . However high levels of reverse thrust may be used in order to control aircraft speed in case of an emergency.*

L1 **CAUTION** *Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases that reenter the compressor, can cause engine stalls, that may result in excessive EGT.*

Ident.: PRO-NOR-SOP-19-A-00012008.0001001 / 09 NOV 21
Applicable to: ALL

AT TAXI SPEED

ALL REVERSER LEVERS..STOW | PF

L2 *When the aircraft reaches the taxi speed, and before it leaves the runway, stow the reversers.*

L1 **CAUTION** *Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.*

L2 *On taxiways, the use of reversers, even restricted to idle thrust, would have the following effects:*
- *The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems*
- *On snow-covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.*

Ident.: PRO-NOR-SOP-19-A-00012010.0001001 / 05 MAY 22
Applicable to: ALL

BEFORE 20 KNOTS

AUTO BRK ....DISENGAGE | PF

L2 *Disengage the autobrake to avoid some brake jerks at low speed.*
The flight crew should use brake pedals to disengage the autobrake.

AUTOLAND

Ident.: PRO-NOR-SOP-19-B-00020787.0001001 / 20 MAR 17
Applicable to: ALL

The following items must be performed in addition to previous *Refer to PRO-NOR-SOP-APPROACH USING LOC G/S Guidance*.

Ident.: PRO-NOR-SOP-19-B-00020776.0001001 / 09 NOV 21
Applicable to: ALL

AT 350 FT RA

LAND ON FMA..CHECK/ANNOUCE | PF
ILS/GLS ◁ /MLS ◁ COURSE ON PFD..........................CHECK | PF

L2 *If the ILS(GLS ◁) course pointer and the runway track differ by more than 5 °, perform a go-around, or a manual landing if visual references are sufficient.*

Ident.: PRO-NOR-SOP-19-B-00020777.0001001 / 09 NOV 21
Applicable to: ALL

AT 40 FT RA

FLARE ON FMA..CHECK/ANNOUNCE | PM

L2 *If the FMA does not display FLARE, perform a go-around, or a manual landing if visual references are sufficient.*

L1 FLARE..MONITOR | PF

Ident.: PRO-NOR-SOP-19-B-00020786.0001001 / 09 NOV 21
Applicable to: ALL

AT 30 FT RA

THR IDLE ON FMA.. CHECK | PM
THRUST IDLE.. CHECK | PM

L2 *Monitor thrust reduction.*

Ident.: PRO-NOR-SOP-19-B-00020778.0001001 / 24 NOV 23
Applicable to: ALL

AT 10 FT RA

L2 An automatic "RETARD" callout triggers.

L1 ALL THRUST LEVERS.. IDLE | PF

L2 *The autothrust disconnects.*

L1 LATERAL GUIDANCE.. MONITOR | PF

L2 *Monitor the lateral guidance by using external references.*

Ident.: PRO-NOR-SOP-19-B-00020779.0001001 / 03 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AT TOUCHDOWN

Note: In the case of NWS or Anti-Skid failure, set the AP OFF at touchdown.

ROLL OUT ON FMA.. CHECK/ANNOUNCE | PM
ALL REVERSER LEVERS.. REV MAX or REV IDLE | PF

L2 *The flight crew must select reverse thrust immediately after main landing gear touchdown.*

L1 *Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.*

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:

- *An emergency*
- *The deceleration is not as expected*
- *A failure affects the landing performance*
- *A long flare or a long touchdown*
- *An unexpected tailwind.*

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the auto-flight system will control this pitch up.

GND SPLRS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM WHEEL SD page displays the ground spoilers extended after touchdown*
- *If no ground spoilers are extended:*
  - *Check that all thrust levers are set to IDLE detent*
  - *Set both thrust reverser levers to MAX REV, and fully press the brake pedals.*

L1 *Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.*

REVERSERS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM E/WD displays the expected reverser deployment (i.e. REV)*
- *If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.*

L1 DIRECTIONAL CONTROL.. MONITOR/ENSURE | PF

L2
- *Monitor directional control, if the rollout is automatic*
- *Ensure directional control, if the rollout is manual. Use the rudder pedals for directional control.*
- *During rollout, avoid sidestick inputs (either lateral or longitudinal)*
- *If the flight crew encounters directional control problems, they should reduce the thrust to REV IDLE until directional control is satisfactory.*

L1 *Do not use the nosewheel steering control handle before reaching taxi speed.*

● **If autobrake is selected:**

AUTOBRAKE...MONITOR | PM

L2 *During all the rollout, the PM monitors the blue light on the autobrake panel and calls out if the autobrake mode disengages.*
If no ground spoilers are extended, the autobrake is not activated.

L1 ● **If landing without autobrake:**

BRAKES... AS RQRD | PF

L2
- *Braking may begin before the nosewheel has touched down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.*

L1 DECELERATION..CHECK/ANNOUNCE | PM

L2 *The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.*

Ident.: PRO-NOR-SOP-19-B-00020779.0015001 / 03 MAY 23
Applicable to: LV-GIF

AT TOUCHDOWN

Note: In the case of NWS or Anti-Skid failure, set the AP OFF at touchdown.

ROLL OUT ON FMA.. CHECK/ANNOUNCE | PM
ALL REVERSER LEVERS.. REV MAX or REV IDLE | PF

L2 *The flight crew must select reverse thrust immediately after main landing gear touchdown.*

L1 *Note: As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.*

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:

- *An emergency*
- *The deceleration is not as expected*
- *A failure affects the landing performance*
- *A long flare or a long touchdown*
- *An unexpected tailwind.*

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the auto-flight system will control this pitch up.

GND SPLRS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM WHEEL SD page displays the ground spoilers extended after touchdown*
- *If no ground spoilers are extended:*
  - *Check that all thrust levers are set to IDLE detent*
  - *Set both thrust reverser levers to MAX REV, and fully press the brake pedals.*

L1 *Note: If ground spoilers are not armed, ground spoilers extend at reverse thrust selection.*

REVERSERS ....CHECK/ANNOUNCE | PM

L2
- *Check that the ECAM E/WD displays the expected reverser deployment (i.e. REV)*
- *If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.*

L1 DIRECTIONAL CONTROL.. MONITOR/ENSURE | PF

L2
- *Monitor directional control, if the rollout is automatic*
- *Ensure directional control, if the rollout is manual. Use the rudder pedals for directional control.*
- *During rollout, avoid sidestick inputs (either lateral or longitudinal)*
- *If the flight crew encounters directional control problems, they should reduce the thrust to REV IDLE until directional control is satisfactory.*

L1 *Do not use the nosewheel steering control handle before reaching taxi speed.*

- **If autobrake is selected:**

  AUTO BRK....................CHECK/ANNOUNCE | PM

L2 *Check and announce BRK LO or BRK MED on the FMA.*
If no ground spoilers are extended, the autobrake is not activated.

L1 AUTOBRAKE....................MONITOR | PM

L2 *During all the rollout, the PM monitors that the FMA displays BRK LO or BRK MED and calls out if the autobrake mode disengages.*

L1
- **If landing without autobrake:**

  BRAKES....................AS RQRD | PF

L2 - *Braking may begin before the nosewheel has touched down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.*

L1 DECELERATION....................CHECK/ANNOUNCE | PM

L2 *The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.*

Ident.: PRO-NOR-SOP-19-B-00020781.0001001 / 28 NOV 23
Applicable to: ALL

AT 70 KNOTS

SEVENTY KNOTS....................ANNOUNCE | PM
ALL REVERSER LEVERS....................IDLE | PF

L2 *It is recommended to reduce reverse thrust when passing 70 kt . However high levels of reverse thrust may be used in order to control aircraft speed in case of an emergency.*

L1

CAUTION	*Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases that reenter the compressor, can cause engine stalls, that may result in excessive EGT.*

Ident.: PRO-NOR-SOP-19-B-00020783.0001001 / 24 NOV 23
Applicable to: ALL

BEFORE 20 KNOTS

AUTO BRK....................DISENGAGE | PF

L2 *Disengage autobrake before 20 kt to avoid some brake jerks at low speed.*
The flight crew should use brake pedals to disengage the autobrake.

Ident.: PRO-NOR-SOP-19-B-00020784.0001001 / 09 NOV 21
Applicable to: ALL

END OF ROLL OUT

ALL REVERSER LEVERS...STOW | PF

L2 *When the aircraft reaches the taxi speed, and before it leaves the runway, stow the reversers.*

L1

CAUTION	*Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.*

L2 *On taxiways, the use of reversers, even restricted to idle thrust, would have the following effects:*
- *The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems*
- *On snow-covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.*

L1 AP.. OFF | PF

L2 *Disengage the APs at the end of the roll out (before leaving the runway at the latest).*

GO AROUND

Ident.: PRO-NOR-SOP-20-A-00011082.0008001 / 09 NOV 21
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

Simultaneously apply the following three actions:

THRUST LEVERS	TOGA	PF

L2 *If TOGA thrust is not required, set the thrust levers to TOGA detent then retard the thrust levers as required. This enables to engage the GO-AROUND phase, with associated AP/FD modes.*
The flight crew may use CL detent to have benefit of A/THR.

L1 *Note: If the thrust levers are not set briefly to TOGA detent, the FMS does not engage the GO AROUND phase, and flying over, or close to the airport (less than 7 NM) will sequence the Destination waypoint in the F-PLN.*

ROTATION	PERFORM	PF

L2 *Initiate rotation towards 15 ° of pitch with all engines operative (approximately 12.5 ° if one engine is out) to get a positive rate of climb then follow SRS Flight Director pitch orders.*
When near the ground, avoid excessive rotation rate in order to prevent a tail strike.

L1

GO AROUND	ANNOUNCE	PF
FLIGHT PARAMETERS	MONITOR	PM
FLAPS	RETRACT ONE STEP	PM
FMA	CHECK/ANNOUNCE	PF

L2 *The following modes are displayed: MAN TOGA / SRS / GA TRK or NAV / A/THR.*
Depending on the guidance modes during approach, NAV mode is either automatically armed or automatically engaged.
For RNP AR, check that NAV mode engages immediately (minimum height 100 ft).

L1

POSITIVE CLIMB	ANNOUNCE	PM
L/G UP	ORDER	PF
L/G	UP	PM
NAV or HDG mode	AS RQRD	PF
GO AROUND ALTITUDE	CHECK	PM

Ident.: PRO-NOR-SOP-20-A-00011082.0007001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

Simultaneously apply the following three actions:

THRUST LEVERS	TOGA	PF

L2 *If TOGA thrust is not required, set the thrust levers to TOGA detent then retard the thrust levers as required. This enables to engage the GO-AROUND phase, with associated AP/FD modes.*
The flight crew may use CL detent to have benefit of A/THR.

L1 *Note:* *If the thrust levers are not set briefly to TOGA detent, the FMS does not engage the GO AROUND phase, and flying over, or close to the airport (less than 7 NM) will sequence the Destination waypoint in the F-PLN.*

ROTATION	PERFORM	PF

L2 *Initiate rotation towards 15 ° of pitch with all engines operative (approximately 12.5 ° if one engine is out) to get a positive rate of climb then follow SRS Flight Director pitch orders.*
When near the ground, avoid excessive rotation rate in order to prevent a tail strike.

L1 GO AROUND	ANNOUNCE	PF
FLIGHT PARAMETERS	MONITOR	PM
FLAPS	RETRACT ONE STEP	PM
FMA	CHECK/ANNOUNCE	PF

L2 *The following modes are displayed: MAN TOGA / SRS / GA TRK or NAV / A/THR.*
Depending on the guidance modes during approach, NAV mode is either automatically armed or automatically engaged.

L1 POSITIVE CLIMB	ANNOUNCE	PM
L/G UP	ORDER	PF
L/G	UP	PM
NAV or HDG mode	AS RQRD	PF
GO AROUND ALTITUDE	CHECK	PM

Ident.: PRO-NOR-SOP-20-A-00011082.0001001 / 09 NOV 21
Applicable to: LV-GKO, LV-GKP

Simultaneously apply the following three actions:

THRUST LEVERS	TOGA	PF

L2 *If TOGA thrust is not required, set the thrust levers to TOGA detent then retard the thrust levers as required. This enables to engage the GO-AROUND phase, with associated AP/FD modes.*
The flight crew may use CL detent to have benefit of A/THR.

L1 *Note:* *If the thrust levers are not set briefly to TOGA detent, the FMS does not engage the GO AROUND phase, and flying over, or close to the airport (less than 7 NM) will sequence the Destination waypoint in the F-PLN.*

ROTATION	PERFORM	PF

L2 *Initiate rotation towards 15 ° of pitch with all engines operative (approximately 12.5 ° if one engine is out) to get a positive rate of climb then follow SRS Flight Director pitch orders.*
When near the ground, avoid excessive rotation rate in order to prevent a tail strike.

L1 GO AROUND	ANNOUNCE	PF
FLIGHT PARAMETERS	MONITOR	PM
FLAPS	RETRACT ONE STEP	PM

FMA	CHECK/ANNOUNCE	PF

L2 *The following modes are displayed: MAN TOGA / SRS / GA TRK / A/THR.*

L1

POSITIVE CLIMB	ANNOUNCE	PM
L/G UP	ORDER	PF
L/G	UP	PM
NAV or HDG mode	AS RQRD	PF
GO AROUND ALTITUDE	CHECK	PM

Ident.: PRO-NOR-SOP-20-A-00011084.0001001 / 09 NOV 21
Applicable to: ALL

AT GO-AROUND THRUST REDUCTION ALTITUDE

THRUST LEVERS	CL	PF

L2 *LVR CLB flashing on FMA.*

Ident.: PRO-NOR-SOP-20-A-00011085.0001001 / 24 NOV 23
Applicable to: ALL

AT GO-AROUND ACCELERATION ALTITUDE

SPEED	MONITOR	PF

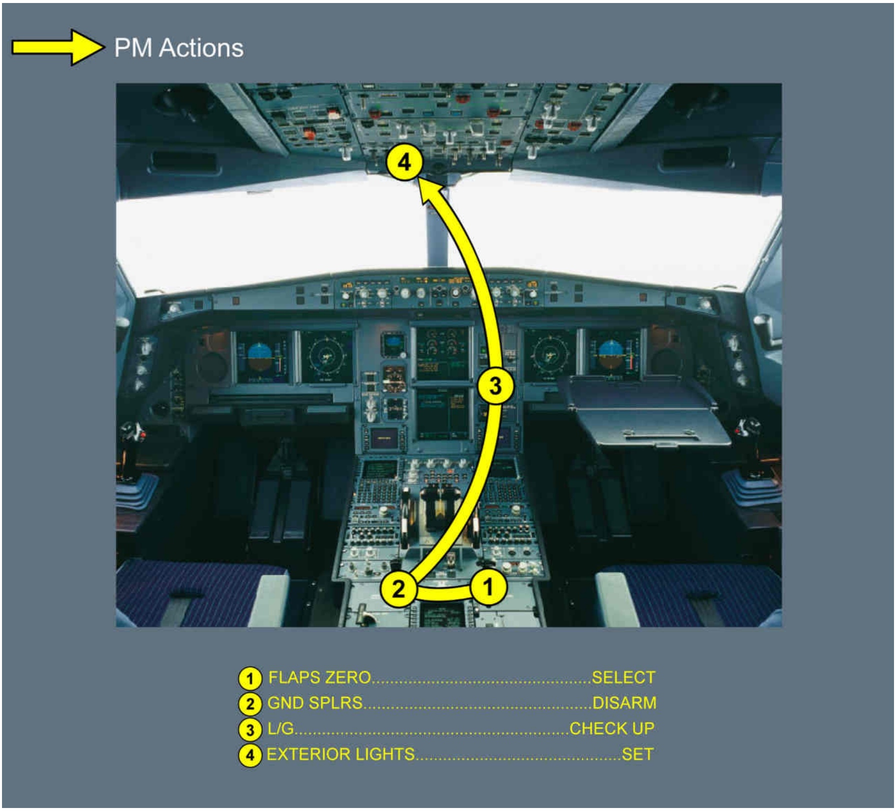
L2 *Monitor that the target speed increases to Green Dot.*

L1

- **If the target speed does not increase to green dot:**

FCU ALT	CHECK	PF
ALT knob	PULL	PF

ACCELERATION FLOW PATTERN



① FLAPS ZERO..SELECT
② GND SPLRS..DISARM
③ L/G..CHECK UP
④ EXTERIOR LIGHTS..SET

- **At F speed**

FLAPS 1..ORDER	PF
FLAPS 1..SELECT	PM

- **At S speed**

FLAPS 0..ORDER	PF
FLAPS 0..SELECT	PM
GND SPLRS......................................DISARM	PM
L/G..CHECK UP	PM
NOSE sw..OFF	PM
RWY TURN OFF sw..........................OFF	PM

OTHER EXTERIOR LIGHTS...AS RQRD | PM

L2 *The flight crew can maintain the LAND sw set to ON, according to airline policy or regulatory recommendations.*

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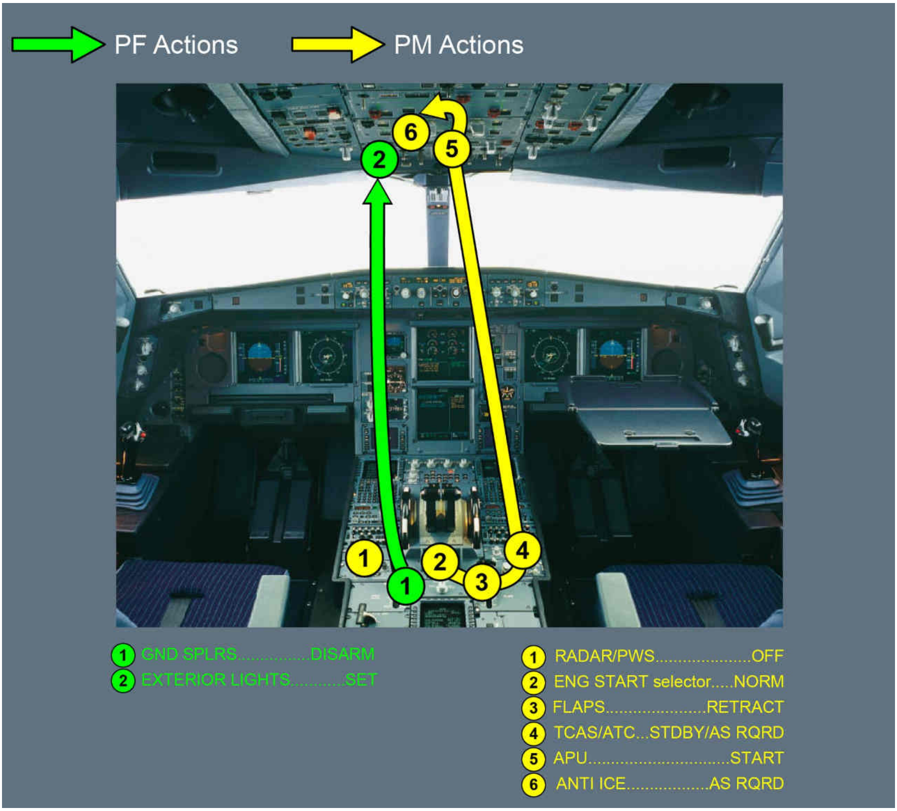
AFTER LANDING

Ident.: PRO-NOR-SOP-21-A-00019950.0001001 / 09 NOV 21
Applicable to: ALL

AFTER LANDING FLOW PATTERN


PF Actions
PM Actions
6
2
5
1
2
4
1
3
1 GND SPLRS................DISARM
2 EXTERIOR LIGHTS............SET
1 RADAR/PWS.....................OFF
2 ENG START selector.....NORM
3 FLAPS......................RETRACT
4 TCAS/ATC...STDBY/AS RQRD
5 APU..............................START
6 ANTI ICE..................AS RQRD

Ident.: PRO-NOR-SOP-21-A-00011014.0001001 / 09 NOV 21
Applicable to: ALL

GROUND SPOILERS

- **When the runway is vacated:**
  GND SPLRS...DISARM | PF

Ident.: PRO-NOR-SOP-21-A-00011013.0001001 / 09 NOV 21
Applicable to: ALL

EXTERIOR LIGHTS

L2 During taxi, the PF may request the PM to set the exterior lights.

L1 LAND sw......................................OFF | PF

- **When leaving the runway:**
  STROBE sw......................................AUTO | PF
  NOSE sw......................................TAXI | PF

- **When crossing a runway:**
  STROBE sw......................................ON | PF

OTHER EXTERIOR LIGHTS......................................AS RQRD | PF

Ident.: PRO-NOR-SOP-21-A-00011017.0001001 / 09 NOV 21
Applicable to: ALL

RADAR

RADAR......................................OFF | PM

Ident.: PRO-NOR-SOP-21-A-00011018.0001001 / 09 NOV 21
Applicable to: ALL

PREDICTIVE WINDSHEAR

PREDICTIVE WINDSHEAR SYSTEM ◁ ....OFF | PM

L2 *Switching the radar and predictive windshear system OFF after landing avoids risk of radiating persons at the gate area.*

Ident.: PRO-NOR-SOP-21-A-00011020.0001001 / 09 NOV 21
Applicable to: ALL

ENG START SELECTOR

ENG START selector......................................NORM | PM

Ident.: PRO-NOR-SOP-21-A-00011021.0001001 / 09 NOV 21
Applicable to: ALL

FLAPS

FLAPS..RETRACT | PM

L2
- *Set the FLAPS lever to 0.*
- *If the approach was performed in icing conditions, or if the runway was contaminated with slush or snow, do not retract the flaps until after engine shutdown, and after the ground crew confirmed that flaps and slats are clear of obstruction due to ice.*
- *On ground, hot weather conditions may cause overheating to be detected around the bleed ducts in the wings, resulting in AIR L(R) WING LEAK alert. Such warnings may be avoided during transit by keeping the slats in CONF 1, when the OAT is above 30 °C.*

Ident.: PRO-NOR-SOP-21-A-00011022.0001001 / 09 NOV 21
Applicable to: ALL

TCAS

TCAS..STBY | PM

Ident.: PRO-NOR-SOP-21-A-00011023.0001001 / 09 NOV 21
Applicable to: ALL

ATC

ATC..AS RQRD | PM

L2 *ATC is set in accordance with airport requirements.*

Ident.: PRO-NOR-SOP-21-A-00011027.0001001 / 09 NOV 21
Applicable to: ALL

APU

APU MASTER SW pb-sw..ON | PM
APU START pb..ON | PM

Note: *APU start may be delayed until before engine shutdown. Before the flight crew shuts down the engines, they must check that the AVAIL light of the APU START pb is on.*

Ident.: PRO-NOR-SOP-21-A-00011024.0003001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ANTI ICE

CAUTION	In icing conditions (*Refer to LIM-ICE_RAIN Definition of Icing Conditions*), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG ANTI ICE...AS RQRD | PM

L2 *If engine anti-ice is used, carefully control taxi speed, particularly on wet or slippery surfaces because ground idle is increased.*

Ident.: PRO-NOR-SOP-21-A-00011024.0004001 / 03 NOV 22
Applicable to: LV-KHT, LV-KHU

ANTI ICE

CAUTION	In icing conditions (Refer to LIM-ICE_RAIN Definition of Icing Conditions), the flight crew must turn on the engine anti-ice and should not wait until seeing ice building up.

ENG ANTI ICE...AS RQRD | PM

L2 *If engine anti-ice is used, carefully control taxi speed, particularly on wet or slippery surfaces because ground idle is increased.*

Ident.: PRO-NOR-SOP-21-A-00011025.0002001 / 09 NOV 21
Applicable to: ALL

BRAKE

BRAKE TEMPERATURE...MONITOR | PM

L2
- *Check the brake temperature for discrepancies and high temperature on the WHEEL SD page*
- *Maintenance action is due in the following cases:*
  - *The temperature difference between two brakes of a gear is more than 150 °C, and the temperature of one of these brakes is above or equal to 600 °C, or*
  - *The temperature difference between two brakes of a gear is more than 150 °C, and the temperature of one of these brakes is below or equal to 60 °C, or*
  - *The difference between the average temperature of the left gear brakes and right brakes is above or equal to 200 °C, or*
  - *The temperature of one brake exceeds 800 °C.*

L1 BRAKE FAN pb-sw ....AS RQRD | PM

L2 *When the turnaround time is short or if the temperature of any brake is likely to exceed 500 °C, use the brake fans without delay. In other cases, the flight crew would delay brake fans selection to 5 min after landing, or approaching the gate, whichever occurs first.*
For more information, Refer to FCTM/PR-NP-SOP-270 Use Of Brake Fans.

Ident.: PRO-NOR-SOP-21-A-00011026.0001001 / 09 NOV 21
Applicable to: ALL

AFTER LANDING CHECKLIST

AFTER LANDING C/L....................................COMPLETE | PF-PM

L2 *Ensure that the after-landing checks are completed after the aircraft cleared the runway.*

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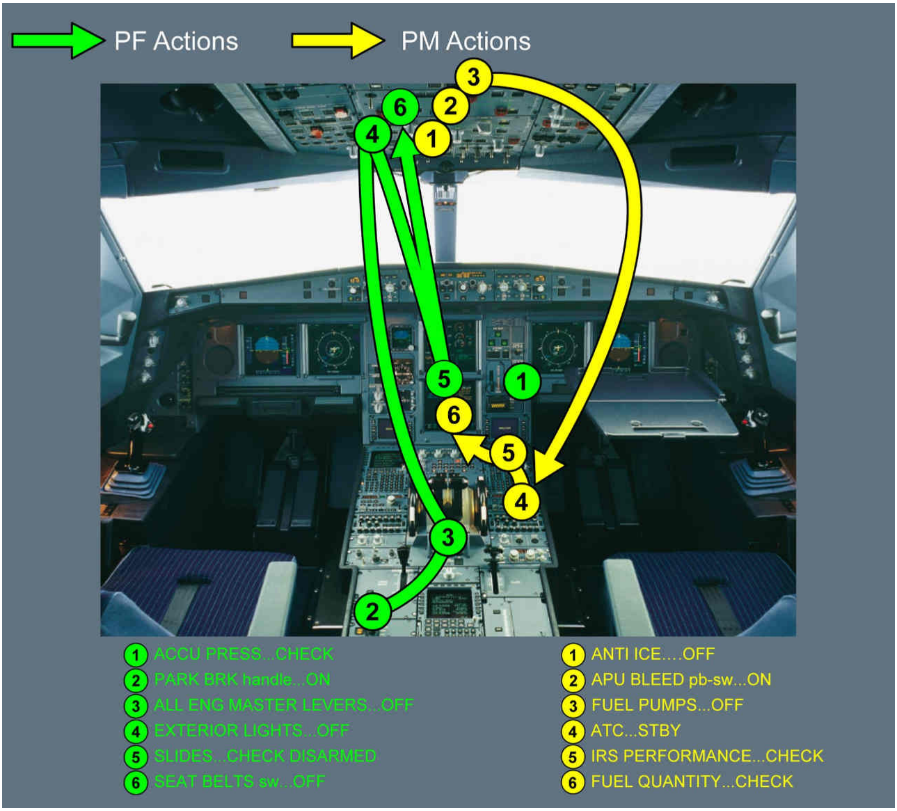
PARKING

Ident.: PRO-NOR-SOP-22-A-00025018.0001001 / 10 MAY 22
Applicable to: ALL

PARKING FLOW PATTERN



1. ACCU PRESS...CHECK
2. PARK BRK handle...ON
3. ALL ENG MASTER LEVERS...OFF
4. EXTERIOR LIGHTS...OFF
5. SLIDES...CHECK DISARMED
6. SEAT BELTS sw...OFF

1. ANTI ICE....OFF
2. APU BLEED pb-sw...ON
3. FUEL PUMPS...OFF
4. ATC...STBY
5. IRS PERFORMANCE...CHECK
6. FUEL QUANTITY...CHECK

Ident.: PRO-NOR-SOP-22-A-00012189.0005001 / 09 NOV 21
Applicable to: ALL

PARK BRK

ACCU PRESS indicator...CHECK PF

L2 *The ACCU PRESS indication must be in the green band. In case of low accumulator pressure, chocks are required before engine shutdown.*

L1 PARK BRK handle.. ON | PF

L2 *If the temperature of one brake is above 500 °C (or above 350 °C with the brake fans ON), avoid applying the parking brake, unless operationally necessary.*

L1 BRAKES PRESS indicator...CHECK | PF

L2 *Keep brake pedals pressed after parking brake application until brakes pressure indications are above the green band on the triple pressure indicator.*

Ident.: PRO-NOR-SOP-22-A-00012190.0001001 / 09 NOV 21
Applicable to: ALL

ANTI ICE

ANTI ICE...OFF | PM

Ident.: PRO-NOR-SOP-22-A-00012191.0001001 / 09 NOV 21
Applicable to: ALL

APU BLEED

APU BLEED pb-sw.. ON | PM

Set the APU BLEED pb-sw to ON immediately before engine shutdown to prevent engine exhaust fumes from entering the air conditioning.

Ident.: PRO-NOR-SOP-22-A-00012192.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ENGINES

- **If the APU is not available:**
  EXT PWR pb.. ON | PF

- **No less than 3 min after high thrust operations:**
  All ENG MASTER LEVERS...OFF | PF

L2 *The DOOR/OXY SD page is displayed on the lower ECAM display.*

L1

Note: *The flight crew should operate the engines at or near idle thrust for a cooling period of 3 min before engine shutdown, in order to thermally stabilize the engines.*

Idle reverse thrust and normal thrust to maneuver during taxi (i.e. at or near idle), are not considered as high thrust operations. Therefore, both of the following applies:
- *If the flight crew used idle reverse thrust for landing and normal thrust to maneuver during taxi after landing, the cooling period starts when the flight crew retards the thrust lever during the flare*
- *If the flight crew used maximum reverse for landing, the cooling period starts when the flight crew sets the thrust lever to idle reverse during the landing rollout.*

Before engine shutdown, routine cooling periods that last less than the recommended time, can result in engine degradation.

ENGINE PARAMETERS.. CHECK | PF

L2 *Check that engine parameters decrease.*

Ident.: PRO-NOR-SOP-22-A-00012192.0004001 / 24 NOV 23
Applicable to: LV-KHT, LV-KHU

ENGINES

- **If the APU is not available:**
  EXT PWR pb.. ON | PF
- **No less than 1 min after high thrust operations:**
  All ENG MASTER LEVERS..OFF | PF

L2 *The DOOR/OXY SD page is displayed on the lower ECAM display.*

L1

Note: *The flight crew must operate the engines at or near idle thrust for a cooling period of 1 min before engine shutdown, in order to thermally stabilize the engines.*

Idle reverse thrust and normal thrust to maneuver during taxi (i.e. at or near idle), are not considered as high thrust operations. Therefore, both of the following applies:
- *If the flight crew used idle reverse thrust for landing and normal thrust to maneuver during taxi after landing, the cooling period starts when the flight crew retards the thrust lever during the flare*
- *If the flight crew used maximum reverse for landing, the cooling period starts when the flight crew sets the thrust lever to idle reverse during the landing rollout.*

Before engine shutdown, routine cooling periods that last less than the required time, can result in engine degradation.

ENGINE PARAMETERS.. CHECK | PF

L2 *Check that engine parameters decrease.*

Ident.: PRO-NOR-SOP-22-A-00012195.0003001 / 09 NOV 21
Applicable to: ALL

EXTERIOR LIGHTS

WING sw..........OFF | PF
BEACON sw..........OFF | PF

L2 *Turn off the beacon lights when all engines spooled down.*

L1 OTHER EXTERIOR LIGHTS..........AS RQRD | PF

L2 *Wing lights may be used briefly for wing inspection. However, as this light can cause heat damage to the jetway, it must be switched off, if the jetway is on the aircraft.*

Ident.: PRO-NOR-SOP-22-A-00012198.0001001 / 09 NOV 21
Applicable to: ALL

FUEL PUMPS

FUEL PUMPS..........OFF | PM

Ident.: PRO-NOR-SOP-22-A-00012194.0001001 / 09 NOV 21
Applicable to: ALL

SLIDES

SLIDES..........CHECK DISARMED | PF

L2 *Check that the slides are disarmed on the DOOR/OXY SD page. Warn the cabin crew, if any slide is not disarmed.*

Ident.: PRO-NOR-SOP-22-A-00012199.0001001 / 09 NOV 21
Applicable to: ALL

ATC

ATC..........STBY | PM

Ident.: PRO-NOR-SOP-22-A-00012196.0001001 / 09 NOV 21
Applicable to: ALL

SEAT BELTS

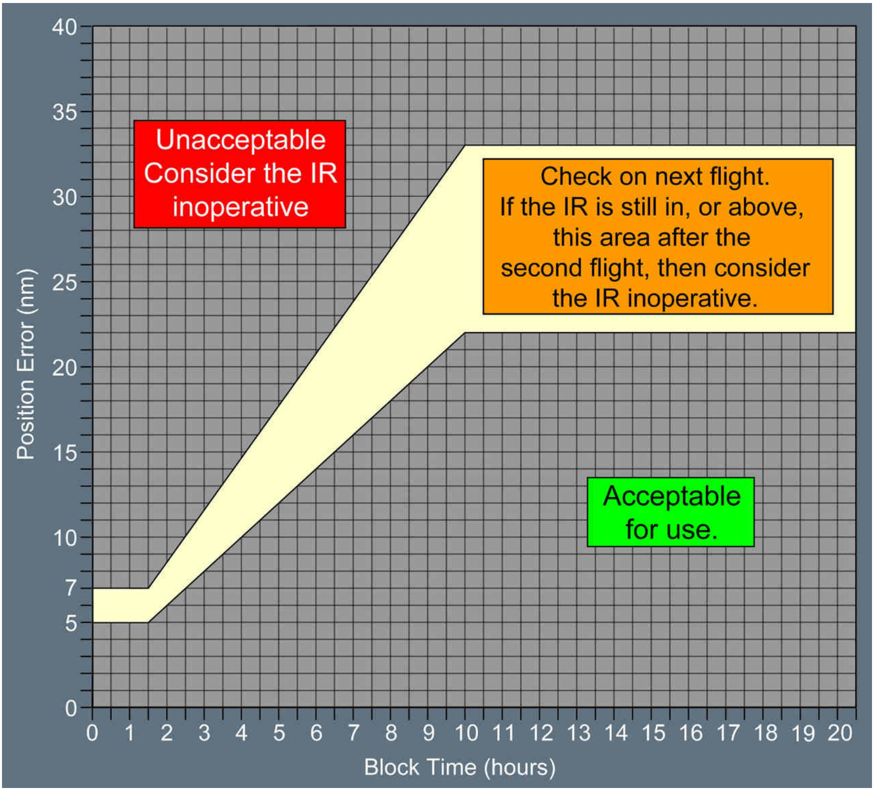
SEAT BELTS sw..........OFF | PF

Ident.: PRO-NOR-SOP-22-A-00012200.0001001 / 09 NOV 21
Applicable to: ALL

IRS PERFORMANCE

IRS PERFORMANCE..........CHECK | PM

On the FMS POSITION/MONITOR page, check that the deviation does not exceed the following:



Ident.: PRO-NOR-SOP-22-A-00012193.0001001 / 09 NOV 21
Applicable to: ALL

GROUND CONTACT

GROUND CONTACT..ESTABLISH | PF

L2
- *The flight crew should establish communication with the ground crew*
- *Check that chocks are in place.*

Ident.: PRO-NOR-SOP-22-A-00012201.0001001 / 09 NOV 21
Applicable to: ALL

FUEL QUANTITY

FUEL QUANTITY..........CHECK | PM

L2 *Check that the sum of the fuel on board and the fuel used is consistent with the fuel on board at departure. If the flight crew detects a discrepancy that is not usual, maintenance action is due.*

Ident.: PRO-NOR-SOP-22-A-00012203.0001001 / 05 MAY 22
Applicable to: ALL

BRAKE FAN

BRK FAN pb..........AS RQRD | PM

L2 *Turn off the brake fans when they are no longer necessary.*

Ident.: PRO-NOR-SOP-22-A-00012204.0001001 / 03 NOV 22
Applicable to: ALL

PARKING BRK

PARK BRK handle..........AS RQRD | PF

L2 *If a temperature of one brake is above 300 °C (or above 150 °C with brake fan ON), the parking brake should be released after the chocks are in place.*
Releasing the parking brake prevents the critical structures from being exposed to high temperature levels for an extended time. However, if operational conditions require (e.g. slippery tarmac), the parking brake may remain applied.
The flight crew should not press the brake pedals before releasing the parking brake. However, the flight crew must be prepared to press the brake pedals after parking brake release, if necessary.

Ident.: PRO-NOR-SOP-22-A-00012208.0001001 / 18 NOV 21
Applicable to: ALL

PARKING CHECKLIST

PARKING C/L..........COMPLETE | PF-PM

Ident.: PRO-NOR-SOP-22-A-00012206.0001001 / 14 NOV 23
Applicable to: ALL

LOGBOOK

STATUS page..........CHECK | CM1

L2 *Press the STS pb (ECAM control panel).*

L1 LOGBOOK..........COMPLETE | CM1

L2 *Complete the logbook according to the STATUS page.*

Ident.: PRO-NOR-SOP-22-A-00021296.0001001 / 09 NOV 21
Applicable to: ALL

EFB

ALL EFB transmitting mode....................AS RQRD | PF-PM

L2 *In accordance with the Operator's policy or, as required by operational regulations.*

L1 ● **If performing transit stop:**
CLEAR/CLOSE FLIGHT....................APPLY | PF-PM

Ident.: PRO-NOR-SOP-22-A-00012205.0001001 / 09 NOV 21
Applicable to: ALL

DISPLAY UNITS

DUs....................DIM | PF-PM

L2 *Dim EFIS, ECAM and MCDU display units.*

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SECURING THE AIRCRAFT

Applicable to: ALL

Ident.: PRO-NOR-SOP-23-A-00011028.0001001 / 09 NOV 21

The flight crew should apply the following procedure as per company policy, when the last passenger left the aircraft and the securing of the aircraft is intended.
Airbus recommends performing the following procedure when the aircraft is left unattended: i.e. no qualified flight crew or ground crew are in the cockpit to supervise and monitor the aircraft systems.

Prior to performing this check, the following SUP Adverse Weather procedures should be taken into account when appropriate:
- Securing the aircraft for cold soak (*Refer to PRO-NOR-SUP-ADVWXR Securing the Aircraft for Cold Soak*).
- Water system draining (*Refer to PRO-NOR-SUP-ADVWXR Water System Depressurization or Draining - General*).
- Operations on contaminated airports (*Refer to PRO-NOR-SUP-ADVWXR Parking*).
- Operations with volcanic ash, sand or dust (*Refer to PRO-NOR-SUP-ADVWXR Securing the Aircraft*).

Ident.: PRO-NOR-SOP-23-A-00011029.0001001 / 09 NOV 21

PARK BRK

PARK BRK handle.. CHECK ON | CM1

L2 *Keep the parking brake on to reduce hydraulic leak rate in the brake accumulator.*

Ident.: PRO-NOR-SOP-23-A-00011030.0001001 / 09 NOV 21

OXYGEN CREW SUPPLY

OXYGEN CREW SUPPLY pb..OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00011031.0001001 / 09 NOV 21

ADIRS

All IR MODE selectors.. OFF | CM1

Note: *The flight crew should not turn off the ADIRS during transits at latitudes above 82 ° N or 82 ° S, in order to avoid excessive alignment time.*

L2 *After turning off the ADIRS, wait at least 10 s before turning off the electrical supply, in order to ensure that the ADIRS memorize the latest data.*

Ident.: PRO-NOR-SOP-23-A-00011033.0001001 / 09 NOV 21

EXTERIOR LIGHTS

EXTERIOR LIGHTS.. OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00011034.0001001 / 09 NOV 21

GND SELECT CTL

GND SELECT CTL sw.. AS RQRD | CM2

L2 *Should electrical power be required for the crew or servicing personnel, consider setting the GND SELECT CTL sw (in the forward cabin) to the ON position, prior to setting aircraft power to off.*

Ident.: PRO-NOR-SOP-23-A-00011035.0001001 / 09 NOV 21

APU BLEED

APU BLEED pb-sw.. OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00024901.0001001 / 09 NOV 21

EXTERNAL POWER

EXT PWR pb.. AS RQRD | CM2

Ident.: PRO-NOR-SOP-23-A-00024902.0001001 / 09 NOV 21

APU

APU MASTER SW pb-sw.. OFF | CM2

L2 *Turn off the APU after all passengers disembarked.*

Ident.: PRO-NOR-SOP-23-A-00011036.0002001 / 10 NOV 23

EMER LIGHTS AND SIGNS

EMER EXIT LT sw.. OFF | CM2
SIGNS sw.. OFF | CM2

Ident.: PRO-NOR-SOP-23-A-00011037.0001001 / 09 NOV 21

BAT

BAT 1 pb-sw and BAT 2 pb-sw and APU BAT pb-sw.. OFF | CM2

L2 *Wait until the APU flap is fully closed (about 2 min after APU AVAIL light goes out) before switching off the APU battery. Switching the batteries off before the APU flap is closed may cause smoke in the cabin during the next flight.*

Ident.: PRO-NOR-SOP-23-A-00026014.0001001 / 24 NOV 23

WINDOWS

WINDOWS.. CHECK CLOSED | CM1-CM2

L2 *To ensure that the sliding window is correctly closed and locked, push the handle of the sliding window fully forward to the closed position, and verify that the red indicator is no longer visible.*

Ident.: PRO-NOR-SOP-23-A-00011038.0001001 / 09 NOV 21

SECURING THE AIRCRAFT CHECKLIST

SECURING THE AIRCRAFT C/L.. COMPLETE | CM1-CM2

Ident.: PRO-NOR-SOP-23-A-00021020.0001001 / 09 NOV 21

ELECTRONIC FLIGHT BAG

EFB APPLICATIONS..CLOSE | BOTH
ALL EFB..SWITCH OFF | BOTH

Intentionally left blank

COMMUNICATIONS AND STANDARD TERMS

Ident.: PRO-NOR-SCO-00011825.0001001 / 29 JUN 11
Applicable to: ALL

Standard phraseology is essential to ensure effective crew communication. The phraseology should be concise and exact. The following Chapter lists the callouts that should be used as standard. They supplement the callouts identified in the SOP.
These standard Airbus callouts are also designed to promote situational awareness, and to ensure crew understanding of systems and their use in line operation.

CHECKLIST CALLOUTS

Ident.: PRO-NOR-SCO-00011826.0001001 / 17 AUG 10
Applicable to: ALL

- "CHECK" : A command for the other pilot to check an item.
- "CHECKED" : A response that an item has been checked.
- "CROSSCHECKED" :A callout verifying information from both pilot stations.

If a checklist needs to be interrupted, announce : “HOLD CHECKLIST AT ___” and “RESUME CHECKLIST AT ___” for the continuation.
Upon completion of a checklist announce : “__CHECKLIST COMPLETE”.

ACTIONS COMMANDED BY PF

Applicable to: ALL

Ident.: PRO-NOR-SCO-A-00011827.0001001 / 10 JAN 11

GENERAL

The following commands do not necessarily initiate a guidance mode change, e.g.: selected to managed/managed to selected. The intent is to ensure clear, consistent, standard communication between crewmembers.
All actions performed on the FCU and MCDU must be checked on the PFD and ND (e.g.: “FL 350 blue”, "FL 200 magenta”). Ensure that the correct FCU knob is used, then verify indications on the PFD/ND.

Ident.: PRO-NOR-SCO-A-00011828.0001001 / 15 JUN 15

SET

The “SET” command means using an FCU knob to set a value, but not to change a mode.

SET is accomplished by only rotating the appropriate selection knob. Example:
- ”SET GO AROUND ALTITUDE__FT”
- “SET FL __”
- “SET HDG __”

Ident.: PRO-NOR-SCO-A-00011829.0001001 / 03 DEC 13

MANAGE/PULL

The “MANAGE” command means pushing an FCU knob to engage, or arm, a managed mode or target.

The “PULL” command means pulling an FCU knob to engage a selected mode or target. Example:

- “PULL HDG 090”	(HDG/TRK knob is pulled and turned).
- “MANAGE NAV”	(HDG/TRK knob is pushed).
- “FL 190 PULL”	(ALT knob is turned and pulled).
- “FL 190 MANAGE”	(ALT knob is turned and pushed).
- “PULL SPEED 250 KNOTS”	(SPD/MACH knob is pulled and turned).
- “MANAGE SPEED”	(SPD/MACH knob is pushed).

Note: *If the value was previously set, there is no requirement to repeat the figure. Simply call e.g. PULL HDG: PULL SPEED: FL PULL.*

The VS/FPA knob has no managed function. The standard callouts for the use of this knob are as follows:
V/S Plus (or Minus) 700 PULL, or

FPA Minus 3 ° PULL	(V/S/FPA knob is turned and pulled)
PUSH TO LEVEL OFF	(V/S/FPA knob is pushed)

Ident.: PRO-NOR-SCO-A-00011830.0001001 / 10 JAN 11

ARM

The “ARM __” command means arming a system by pushing the specified FCU pb.
e.g.: “ARM APPROACH”
e.g.: “ARM LOC.”

Ident.: PRO-NOR-SCO-A-00011831.0001001 / 10 JAN 11

ON/OFF

The simple ON or OFF command is used for the autopilot, flight directors, autothrust and the bird (flight path vector).
e.g.: BIRD ON (The HDG-V/S/TRK-FPA pb is pushed).

FMA

Ident.: PRO-NOR-SCO-00011832.0001001 / 23 DEC 14
Applicable to: ALL

The PF should call out any FMA change, unless specified differently (e.g. CAT II & III task sharing). Therefore, the PF should announce :
- All armed modes with their associated color (e.g. blue, magenta): "G/S blue", "LOC blue"
- All active modes without their associated color (e.g. green, white): "NAV", "ALT".

The PM should check and respond, "CHECKED" to all FMA changes called out by the PF.

ALTITUDE

Ident.: PRO-NOR-SCO-00011833.0001001 / 23 DEC 14
Applicable to: ALL

The PM calls out "one thousand to go" when passing 1 000 ft before the cleared altitude or FL, and the PF calls out "checked".

FLAPS OR GEAR CALLOUTS

Applicable to: ALL

Ident.: PRO-NOR-SCO-B-00011834.0001001 / 23 DEC 14

FLAPS' CALLOUTS

FLAPS' CONFIGURATION	CALL
1	"FLAPS ONE"
1 + F	"FLAPS ONE"
0	"FLAPS ZERO"

The reply will be given when selecting the new flap position.
e.g:

	CALLOUT	REMARK
PF	"FLAPS ONE"	
PM	"SPEED CHECKED"	PM checks the speed: - Above the S or F speed and accelerating (Takeoff) - Below VFE next and decelerating (Approach)
	"FLAPS ONE"	PM selects the FLAPS lever position and replies after checking the blue number on the ECAM flaps indicator to confirm the correct selection has been made.

Ident.: PRO-NOR-SCO-B-00011835.0001001 / 23 DEC 14

GEAR CALLOUTS

	CALLOUT	REMARK
PF	"GEAR UP (DOWN)"	
PM	"GEAR UP (DOWN)"	The PM selects the L/G lever position and replies after checking the red lights on the LDG GEAR indicator to confirm gear operation.

FLIGHT PARAMETERS

Ident.: PRO-NOR-SCO-C-00011836.0001001 / 02 JUN 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

APPROACH

During approach, the PM announces:
- "SPEED" if the speed decreases below the speed target -5 kt, or increases above the speed target +10 kt.
- "SINK RATE" when the descent rate exceeds 1 200 ft/min
- "BANK" when bank angle becomes greater than 7 °
- "PITCH" when pitch attitude becomes lower than 0 ° or higher than +10 °
- "LOC" or "GLIDE" when either localizer or glide slope deviation is:
  - ½ dot LOC
  - ½ dot GS
- "CROSS TRACK" when the XTK is greater than 0.1 NM
- "VDEV" when the vertical deviation is greater than ½ dot
- "COURSE" when greater than ½ dot or 2.5 °(VOR) or 5 ° (ADF ◁)
- "__FT HIGH (LOW)" at altitude checks points.

Note: *The PM announces the attitude deviations until landing.*

Ident.: PRO-NOR-SCO-C-00011836.0004001 / 28 MAY 20
Applicable to: LV-KAN, LV-KAO

APPROACH

During approach, the PM announces:
- "SPEED" if the speed decreases below the speed target -5 kt, or increases above the speed target +10 kt
- "SINK RATE" when the descent rate exceeds 1 200 ft/min
- "BANK" when bank angle becomes greater than 7 °
- "PITCH" when pitch attitude becomes lower than 0 ° or higher than +10 °

- "LOC" or "GLIDE" when either localizer or glide slope deviation is:
  - ½ dot LOC
  - ½ dot GS
- "CROSS TRACK" when the XTK is greater than 0.1 NM
- "VDEV" when the vertical deviation is greater than ½ dot
- "COURSE" when greater than ½ dot or 2.5 °(VOR) or 5 ° (ADF ◁)
- "__FT HIGH (LOW)" at altitude checks points.

Note: The PM announces the attitude deviations until landing.

RNAV (RNP) APPROACH

- "LAT-DEV", when L/DEV reaches ½ dot
- "VDEV", when ½ dot deviation above or below path
- "SINK RATE", when the descent rate exceeds 1 200 ft/min
- "BANK", when the bank angle goes above 30 °.

Ident.: PRO-NOR-SCO-C-00011836.0006001 / 04 NOV 20
Applicable to: LV-KHT, LV-KHU

APPROACH

The PM announces:

- "SPEED" if the speed goes below the speed target -5 kt, or goes above the speed target +10 kt
- "SINK RATE" when the descent rate goes above 1 200 ft/min
- "BANK" when the bank angle goes above 7 °
- "PITCH" when the pitch attitude goes below 0 ° or above +10 °
- "LOC" or "GLIDE" when either localizer or glide slope deviation is:
  - ½ dot LOC
  - ½ dot GS
- "CROSS TRACK" when the XTK goes above 0.1 NM
- "VDEV" when the vertical deviation goes above ½ dot
- "COURSE" when the course goes above ½ dot or 2.5 °(VOR) or 5 ° (ADF ◁)
- "__FT HIGH (LOW)" at altitude checks points.

Note: The PM announces the attitude deviations until landing.

RNAV(RNP) APPROACH

The PM announces:

- "CROSS TRACK", when XTK error reaches 0.1 NM
- "VDEV", when ½ dot deviation goes above or below path

- "SINK RATE", when the descent rate goes above 1 200 ft/min
- "BANK", when the bank angle goes above 30 °.

Ident.: PRO-NOR-SCO-C-00021402.0001001 / 22 MAR 17
Applicable to: ALL

LANDING

During landing, the PM announces:

- "PITCH PITCH", if the pitch attitude approaches the tail strike pitch limit indicator ◁ , or reaches 7.5 °.
- "BANK BANK", if the bank angle reaches 7 °.

Ident.: PRO-NOR-SCO-C-00011837.0001001 / 22 MAR 17
Applicable to: ALL

GO-AROUND

During a go-around, the PM announces:

- "BANK", if the bank angle becomes greater than 7 °
- "PITCH", if the pitch attitude becomes greater than 20 ° up or less than 10 ° up
- "SINK RATE", if there is no climb rate.

PF/PM DUTIES TRANSFER

Ident.: PRO-NOR-SCO-00011838.0001001 / 23 DEC 14
Applicable to: ALL

To transfer control, flight crewmembers must use the following callouts:

To give control : The pilot calls out "YOU HAVE CONTROL". The other pilot accepts this transfer by calling out "I HAVE CONTROL", before assuming PF duties.

To take control: The pilot calls out "I HAVE CONTROL". The other pilot accepts this transfer by calling out "YOU HAVE CONTROL", before assuming PM duties.

SUMMARY FOR EACH PHASE

Applicable to: ALL

Ident.: PRO-NOR-SCO-D-00011841.0001001 / 23 DEC 14

	TO REMOVE GROUND SUPPLY	
EVENT	**PF or PM**	**GND Mech**
Initial ground contact	GROUND (from) COCKPIT	COCKPIT (from) GROUND
External __ disconnection	REMOVE EXTERNAL __	EXTERNAL__ REMOVED

Ident.: PRO-NOR-SCO-D-00011843.0001001 / 18 NOV 21

PUSHBACK/ENGINE START		
EVENT	**PF**	**GND Mech**
When ready for pushback, and pushback clearance received from ATC	GROUND (from) COCKPIT, CLEARED FOR PUSH	COCKPIT (from) GROUND, RELEASE BRAKES
Start of push	BRAKES RELEASED READY TO PUSH	
When ready to start engines	CLEAR TO START? STARTING ENG(S)__	CLEAR TO START
When pushback complete	BRAKES SET	SET BRAKES
When ready to disconnect (after engine started, and parameters are stabilized)	CLEAR TO DISCONNECT (hand signals on left/right)	DISCONNECTING (hand signals on left/right)

Ident.: PRO-NOR-SCO-D-00011845.0001001 / 24 NOV 23

TAXI		
EVENT	**PF**	**PM**
When taxi clearance obtained	CLEAR LEFT (RIGHT) SIDE	CLEAR RIGHT (LEFT) SIDE
Brake transfer check	BRAKE CHECK	PRESSURE ZERO
Flight control check (can be done before start of taxi):	FLIGHT CONTROL CHECK	
1. Elevators		FULL UP, FULL DOWN, NEUTRAL
2. Ailerons/Spoilers		FULL LEFT, FULL RIGHT, NEUTRAL
3. Rudder (1)	RUDDER	FULL LEFT, FULL RIGHT, NEUTRAL

(1) *The PM should follow pedal movement with PM's feet.*

Ident.: PRO-NOR-SCO-D-00011846.0001001 / 24 NOV 23

TAKE-OFF		
EVENT	**PF**	**PM**
Setting thrust levers to initial stabilization value	TAKEOFF	
Before passing 80 kt		THRUST SET
At 100 kt	CHECKED	ONE HUNDRED KNOTS

Continued on the following page

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TAKE-OFF		
EVENT	**PF**	**PM**
At V1		V1 (1)
At VR		ROTATE
Gear retraction	GEAR UP	POSITIVE CLIMB GEAR UP
If AP is engaged by PM	AP 1(2) ON	

(1) *The PM monitors the auto callout, or announces if it is inoperative.*

Ident.: PRO-NOR-SCO-D-00011848.0001001 / 18 MAY 16

ALTIMETER SETTING CHANGES TO/FROM QNH/QFE-STD		
EVENT	**PF**	**PM**
Barometric setting change and subsequent altimeter cross-check	SET STANDARD (SET QNH/QFE) CHECKED	STANDARD (QNH/QFE) CROSS-CHECKED PASSING FL __(__FT) NOW

Ident.: PRO-NOR-SCO-D-00011849.0001001 / 24 NOV 23

APPROACH AND LANDING		
EVENT	**PF**	**PM**
Activation of approach Phase	ACTIVATE APPROACH PHASE	APPROACH PHASE ACTIVATED
RA alive	CHECKED	RADIO ALTIMETER ALIVE (1)(2)
At F-G/S*, G/S*, FINAL APP or below the go-around altitude for approach with FPA guidance	● **If the PF requests the PM to set the go-around altitude:** SET GA ALTITUDE_FT	GA ALTITUDE_SET
	● **If the PF sets the go-around altitude:** GA ALTITUDE_SET	CHECKED
FDP	CHECKED	PASSING__(Fix Name),__FT,
1 000 ft RA	CHECKED	ONE THOUSAND (2)
100 ft above MDA/DH	CHECKED	ONE HUNDRED ABOVE (2)
MDA/DH visual reference(6)	CONTINUE	MINIMUM (2)

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APPROACH AND LANDING		
EVENT	**PF**	**PM**
MDA/DH no visual reference(6)	GO AROUND-FLAPS	MINIMUM (2)
100 ft RA		ONE HUNDRED (2)
50 ft RA		FIFTY (2)
After touchdown Ground spoilers extended REV green on EWD		SPOILERS (3) REVERSE GREEN, (4)
Deceleration		DECEL (5)
Autobrake disengagement	MANUAL BRAKING(7)	AUTOBRAKE OFF(8)
At 70 kt	CHECKED	SEVENTY KNOTS

(1) *Flight crew awareness, flight crew should now keep RA in scan to landing.*

(2) *PM monitors pin-programmed auto callout, or announces if inoperative.*

(3) *If the spoilers are not extended, call "NO SPOILERS".*

(4) *If the reverse deployment is not as expected, call "NO REVERSE ENGINE_" or "NO REVERSE", as appropriate.*

(5) *In the case of a failure or no deceleration, "NO DECEL"*

The "DECEL" callout means that the deceleration is felt by the flight crew and confirmed by:
- *The speed trend on the PFD, or*
- *The DECEL ◁ indication on the PFD, if the autobrake is active.*

The DECEL ◁ indication appears when the current deceleration rate reaches 80 % of the selected rate. However, the DECEL ◁ indication does not indicate that the autobrake is operating correctly, it only indicates that the selected deceleration rate is almost reached. For example, the DECEL ◁ indication may not appear on a contaminated runway because of the anti-skid effect, even if the autobrake is active.

(6) *In the case of circling approach, this callout should be performed at the latest, at the MAP.*

(7) *PF announces MANUAL BRAKING when using the brake pedals if:*
- *Autobrake was selected for the landing*
- *No AUTOBRAKE OFF callout from the PM.*

(8) *PM announces AUTOBRAKE OFF if:*
- *Autobrake does not engage as expected or autobrake disengages*
- *No MANUAL BRAKING callout from the PF.*

Ident.: PRO-NOR-SCO-D-00015191.0001001 / 23 DEC 14

DISCONTINUED APPROACH		
EVENT	**PF**	**PM**
DISCONTINUED APPROACH decision	CANCEL APPROACH	

Ident.: PRO-NOR-SCO-D-00011850.0001001 / 09 NOV 21

GO AROUND		
EVENT	**PF**	**PM**
GO AROUND decision	GO AROUND - FLAPS	
Flaps retraction		FLAPS__
Gear retraction	GEAR UP	POSITIVE CLIMB GEAR UP

SAFETY EXTERIOR INSPECTION

Ident.: PRO-NOR-TSK-00024864.0001001 / 24 NOV 23
Applicable to: ALL

CM1	CM2
	WHEEL CHOCKS......CHECK
	L/G DOORS......CHECK POSITION
	APU AREA......CHECK

PRELIMINARY COCKPIT PREPARATION

Ident.: PRO-NOR-TSK-A-00024977.0001001 / 18 NOV 21
Applicable to: ALL

AIRCRAFT SETUP:

CM1	CM2
	ALL ENG MASTER LEVERS......OFF
	ENG START selector......NORM
	* WEATHER RADAR......OFF
	* WINDSHEAR/PWS sw......OFF
	L/G lever......DOWN
	Both WIPER selectors......OFF

Ident.: PRO-NOR-TSK-A-00024979.0001001 / 09 NOV 21
Applicable to: ALL

BATTERIES/EXTERNAL POWER:

CM1	CM2
	BAT......CHECK/AUTO
	EXT PWR pb......ON

Ident.: PRO-NOR-TSK-A-00024980.0001001 / 28 NOV 23
Applicable to: ALL

APU FIRE TEST/APU START:

CM1	CM2
	RMP......CHECK ON/SET
	ACP......CHECK ON/SET
	APU FIRE TEST......PERFORM
	APU......START
	•When the APU is AVAIL: AIR COND panel......SET
	* EXT PWR pb......AS RQRD

Ident.: PRO-NOR-TSK-A-00024987.0002001 / 24 NOV 23
Applicable to: ALL

ADIRS:

CM1	CM2
	* ALL IR MODE selector...NAV

Ident.: PRO-NOR-TSK-A-00024981.0001001 / 09 NOV 21
Applicable to: ALL

COCKPIT LIGHTS:

CM1	CM2
* COCKPIT LIGHTS.. AS RQRD	* COCKPIT LIGHTS.. AS RQRD

Ident.: PRO-NOR-TSK-A-00026200.0001001 / 24 NOV 23
Applicable to: ALL

EFB/ACARS INITIALIZATION:

CM1	CM2
All EFB..START	All EFB.. START
EFB/eQRH Version..CHECK	EFB/eQRH Version...CHECK
* ACARS ....INITIALIZE	
•If the ACARS operations or the EFB operations with SYNCHRO AVIONICS is used: FMGS PRE-INITIALIZATION: * ENGINE & AIRCRAFT TYPE.............CHECK * DATABASE VALID............................CHECK * FLT NBR & FROM/TO......... INSERT/CHECK	
* EFB SYNCHRO AVIONICS................................. CLICK	* EFB SYNCHRO AVIONICS...................................CLICK
* EFB STATUS page...............................INSERT/CHECK	* EFB STATUS page.................................INSERT/CHECK

Ident.: PRO-NOR-TSK-A-00024983.0001001 / 24 NOV 23
Applicable to: ALL

AIRCRAFT ACCEPTANCE:

CM1	CM2
* RCL pb...PRESS 3 s	
* LOGBOOK AND MEL/CDL ITEMS.. CHECK	
AIRCRAFT CONFIGURATION SUMMARY...CHECK	
* OEB...CHECK	
* AIRCRAFT ACCEPTANCE............................ PERFORM	

Ident.: PRO-NOR-TSK-A-00024984.0001001 / 06 MAY 22
Applicable to: ALL

PRELIMINARY PERFORMANCE DETERMINATION:

CM1	CM2
* AIRFIELD DATA....................OBTAIN	* AIRFIELD DATA....................OBTAIN
•If the LOADSHEET application is used:	
* PRELIMINARY LOADING..... COMPUTE/CROSSCHECK	* PRELIMINARY LOADING..... COMPUTE/CROSSCHECK
* MEL/CDL ITEMS.................. CHECK ACTIVATED	* MEL/CDL ITEMS.................. CHECK ACTIVATED
* NAV CHARTS CLIPBOARD.................... PREPARE	
* PRELIM T.O PERF DATA.................. COMPUTE	* PRELIM T.O PERF DATA.................. COMPUTE
* PRELIM T.O PERF DATA.................... CROSSCHECK	

Ident.: PRO-NOR-TSK-A-00024985.0004001 / 17 MAY 22
Applicable to: LV-GKO, LV-GKP

BEFORE WALKAROUND:

PF	PM
	* ECAM OXY PRESS/HYD QTY/ENG OIL QTY..... CHECK
	FLAPS.................... CHECK POSITION
	* SPEED BRAKE lever....... CHECK RET AND DISARMED
	* ACCU PRESS....................CHECK
	* PARK BRK handle.................... ON
	* BRAKES PRESS indicator....................CHECK
	ALTN BRAKING.................... CHECK
	EMER EQPT .... CHECK
	* GEAR PINS....................CHECK ONBOARD/STOWED
	* EXTERIOR WALKAROUND....................PERFORM

Ident.: PRO-NOR-TSK-A-00024985.0006001 / 17 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

BEFORE WALKAROUND:

PF	PM
	* ECAM OXY PRESS/HYD QTY/ENG OIL QTY..... CHECK
	FLAPS.................... CHECK POSITION
	* SPEED BRAKE lever....... CHECK RET AND DISARMED
	* ACCU PRESS....................CHECK
	* PARK BRK handle.................... ON
	* BRAKES PRESS indicator....................CHECK
	ALTN BRAKING.................... CHECK
	EMER EQPT .... CHECK
	RAIN REPELLENT.................... CHECK
	* GEAR PINS....................CHECK ONBOARD/STOWED
	* EXTERIOR WALKAROUND....................PERFORM

COCKPIT PREPARATION

Applicable to: ALL

Ident.: PRO-NOR-TSK-B-00024970.0001001 / 24 NOV 23

OVERHEAD PANEL:

PF	PM
As a general rule, during the scan sequence: * All white lights (except MAINTENANCE panel)..........OFF	
* RCDR GND CTL pb-sw..........ON	
CAPT & PURS/CAPT sw..........AS RQRD	
* RESET BUTTONS (left side)..........CHECK	
EXTERIOR LIGHTS..........SET	
* SIGNS panel..........SET	
PROBE/WINDOW HEAT pb-sw..........AUTO	
LDG ELEV..........AUTO	
VALVE selector..........BOTH	
* PACK FLOW..........AS RQRD	
ELEC panel..........CHECK	
BAT..........CHECK	
T TANK MODE pb-sw..........CHECK AUTO	
T TANK FEED selector..........CHECK AUTO	
ENG FIRE..........CHECK/TEST	
MAINT panel..........CHECK	
CARGO AIR COND panel..........AS RQRD	
PA (3rd occupant)..........RECEPT	
CVR TEST pb..........PRESS and MAINTAIN	
* RESET BUTTONS (right side)..........CHECK	
DATA LOADER..........CHECK OFF	

Ident.: PRO-NOR-TSK-B-00024973.0001001 / 24 NOV 23

CTR INSTRUMENT PANEL:

PF	PM
* ISIS/STBY INSTRUMENTS..........CHECK	
* NORTH REF..........CHECK	
ECAM SWITCHING..........CHECK	
* CLOCK..........CHECK/SET	
L/G GEAR GRVTY EXTN selector..........CHECK	
* A/SKID & N/W STRG sw..........ON	

Ident.: PRO-NOR-TSK-B-00024974.0001001 / 24 NOV 23

PEDESTAL:

PF	PM
RMP.. CHECK ON/SET	
ACP.. CHECK ON/SET	
* ACCU PRESS.. CHECK	
* PARK BRK handle.. ON	
* BRAKES PRESS.. CHECK	
* COCKPIT DOOR sw.. NORM	
SWITCHING PANEL.. NORM	
* THRUST levers.. IDLE	
* THRUST REVERSER levers........................ STOWED	
* ENG MASTER levers.. OFF	
* ENG START selector.. NORM	
* ATC.. STBY	
* TCAS.. STBY	
* ATC SYS 1.. SELECT	
* MSG RECORD (MCDU)................................ ERASE	
ADS (MCDU).. CHECK ARMED	
* FMS.. PREPARE	
	* FMS PREPARATION........................ CROSSCHECK
	* EFB/MCDU GREEN DOT........................ COMPARE

Ident.: PRO-NOR-TSK-B-00024975.0001001 / 06 NOV 23

GLARESHIELD:

PF	PM
•When both flight crew members are seated:	
* LOUDSPEAKER knob.. SET	* LOUDSPEAKER knob.. SET
* BAROMETRIC REFERENCE.................................... SET/CROSSCHECK	
* FD.. CHECK ON	* FD.. CHECK ON
* LS pb.. AS RQRD	* LS pb.. AS RQRD
* ND mode and range................................ AS RQRD	* ND mode and range................................ AS RQRD
* ADF/VOR sw.. AS RQRD	* ADF/VOR sw.. AS RQRD
* FCU.. SET	

Ident.: PRO-NOR-TSK-B-00024976.0001001 / 24 NOV 23

LATERAL CONSOLE AND PF/PM INSTRUMENT PANELS:

PF	PM
OXYGEN MASK.. TEST	OXYGEN MASK.. TEST
EFIS DMC selector................................ CHECK NORM	EFIS DMC selector................................ CHECK NORM
PFD-ND brightness................................ AS RQRD	PFD-ND brightness................................ AS RQRD

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LATERAL CONSOLE AND PF/PM INSTRUMENT PANELS:

PF	PM
* PFD-ND..CHECK	* PFD-ND..CHECK
* LDG ELEV (ECAM)................................CHECK AUTO	* IRS ALIGN...CHECK
* ECAM STATUS..CHECK	
* FOB..CHECK	* FOB..CHECK
* DEPARTURE BRIEFING................................PERFORM	
* COCKPIT PREPARATION C/L....................COMPLETE	* COCKPIT PREPARATION C/L.....................COMPLETE

BEFORE PUSHBACK OR START

Applicable to: ALL

Ident.: PRO-NOR-TSK-C-00024960.0001001 / 24 NOV 23

BEFORE PUSHBACK/START CLEARANCE:

PF	PM
FINAL LOADSHEET..CHECK	FINAL LOADSHEET..CHECK
FUEL ON BOARD..CHECK	FUEL ON BOARD..CHECK
•If takoff conditions changed: FINAL T.O PERF DATA..............................RECOMPUTE FMS T.O DATA...REVISE	FINAL T.O PERF DATA..............................RECOMPUTE
	FINAL T.O PERF DATA..............................CROSSCHECK
	EFB/MCDU GREEN DOT..................................COMPARE
SEATING POSITION..ADJUST	SEATING POSITION..ADJUST
HUD ....DEPLOY/ADJUST	HUD ....DEPLOY/ADJUST
FMS PERF T.O page..SELECT	FMS F-PLN page..SELECT
	AIR CONDITIONING UNITS........CHECK DISCONNECTED
	EXT PWR pb..CHECK AVAIL
	EXT PWR DISCONNECTION ....REQUEST

Ident.: PRO-NOR-TSK-C-00024961.0001001 / 09 NOV 21

AT PUSHBACK/START CLEARANCE:

PF	PM
	PUSHBACK/START CLEARANCE..........................OBTAIN
BEACON sw...ON	
	ATC...SET FOR OPERATIONS
WINDOWS/DOORS................................CHECK CLOSED	WINDOWS/DOORS................................CHECK CLOSED
SLIDES...CHECK ARMED	SLIDES...CHECK ARMED
THRUST LEVERS...IDLE	
ACCU PRESS...CHECK	

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AT PUSHBACK/START CLEARANCE:

PF	PM
•If pushback is not required:	
PARK BRK handle...ON	
BEFORE START C/L...................................... COMPLETE	BEFORE START C/L...................................... COMPLETE
•If pushback is required:	
NW STRG DISC MEMO......................CHECK DISPLAYED	
BEFORE START C/L...................................... COMPLETE	BEFORE START C/L...................................... COMPLETE
PARK BRK handle...OFF	
•When pushback is completed:	
PARK BRK handle...ON	

ENGINE START

Ident.: PRO-NOR-TSK-00024870.0001001 / 09 NOV 21
Applicable to: ALL

PF	PM
THRUST LEVERS...IDLE	
ENG START selector...IGN START	
ENGINE 1 START.. ANNOUNCE	
ENG 1 MASTER LEVER..ON	
ENG IDLE PARAMETERS...................................... CHECK	
REPEAT THE START SEQUENCE FOR ENG 2	

AFTER START

Ident.: PRO-NOR-TSK-00024871.0004001 / 03 NOV 22
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

PF	PM
ENG START selector..NORM	
APU BLEED pb-sw...OFF	GND SPLRS .... ARM
ANTI ICE...AS RQRD	RUD TRIM.. CHECK NEUTRAL
	FLAPS.. SET
•If the APU is not required: APU MASTER SW pb-sw......................................OFF	PITCH TRIM..SET
NWS TOWING FAULT LT ....CHECK OFF	
ECAM STATUS.. CHECK	ECAM STATUS.. CHECK
NW STRG DISC MEMO............. CHECK NOT DISPLAYED	
CLEAR TO DISCONNECT................................ ANNOUNCE	
AFTER START C/L... COMPLETE	AFTER START C/L... COMPLETE

AFTER START

Ident.: PRO-NOR-TSK-00024871.0003001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KHT, LV-KHU

PF	PM
ENG START selector.......NORM	
APU BLEED pb-sw.......OFF	GND SPLRS.......ARM
ANTI ICE.......AS RQRD	RUD TRIM.......CHECK NEUTRAL
	FLAPS.......SET
•If the APU is not required: APU MASTER SW pb-sw.......OFF	PITCH TRIM.......CHECK
NWS TOWING FAULT LT ....CHECK OFF	
ECAM STATUS.......CHECK	ECAM STATUS.......CHECK
NW STRG DISC MEMO.......CHECK NOT DISPLAYED	
CLEAR TO DISCONNECT.......ANNOUNCE	
AFTER START C/L.......COMPLETE	AFTER START C/L.......COMPLETE

TAXI

Ident.: PRO-NOR-TSK-00024873.0015001 / 12 MAY 22
Applicable to: ALL

PF	PM
	TAXI CLEARANCE.......OBTAIN
EXTERIOR LIGHTS.......SET	
PARK BRK handle.......OFF	
BRAKES.......CHECK	BRAKE FAN pb.......AS RQRD
	BRAKES PRESSURE.......CHECK AT ZERO
F/CTL.......CHECK	F/CTL.......CHECK
	ATC CLEARANCE.......CONFIRM
	FMS F-PLN/SPD.......CHECK
	FCU ALT/HDG.......SET
	BOTH FD.......CHECK ON
PFD/ND.......CHECK	PFD/ND.......CHECK
DEPARTURE BRIEFING.......CONFIRM	
	AUTO BRK MAX pb-sw.......ARM
TERR ON ND ....AS RQRD	TERR ON ND ....AS RQRD
	ATC CODE/MODE.......CONFIRM/SET FOR TAKEOFF
	ENG START selector.......AS RQRD
	WEATHER RADAR.......ON
	PREDICTIVE WINDSHEAR SYSTEM.......AUTO
	T.O CONFIG pb.......TEST
	T.O MEMO.......CHECK NO BLUE

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PF	PM
CABIN REPORT....RECEIVE	CABIN REPORT....RECEIVE
TAXI C/L....COMPLETE	TAXI C/L....COMPLETE

DEPARTURE CHANGE

Ident.: PRO-NOR-TSK-00024951.0001001 / 09 NOV 21
Applicable to: ALL

PF	PM
FINAL T.O PERF DATA....RECOMPUTE	FINAL T.O PERF DATA....RECOMPUTE
	FINAL T.O DATA....REVISE
FMS REVISED T.O PERF DATA....CROSSCHECK	
EFB/MCDU GREEN DOT....COMPARE	
	FLAPS lever....AS APPROPRIATE
	FMS F-PLN/SPD....CHECK
RE-BRIEFING....COMPLETE	
DEPARTURE CHANGE C/L....COMPLETE	DEPARTURE CHANGE C/L....COMPLETE

BEFORE TAKEOFF

Ident.: PRO-NOR-TSK-00024874.0006001 / 24 NOV 23
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

PF	PM
	•If the Brake Fans are set to ON and the temperature of all brakes is below 150 °C: BRAKE FAN pb....OFF
	LINE-UP CLEARANCE....OBTAIN
	TCAS....TA or TA/RA
TAKEOFF RUNWAY....CONFIRM	TAKEOFF RUNWAY....CONFIRM
APPROACH PATH....CLEAR OF TRAFFIC	APPROACH PATH....CLEAR OF TRAFFIC
EXTERIOR LIGHTS....SET	PACKS 1 and 2....AS RQRD
•If RNP AR departure:	
	GPS 1+2 on GPS MONITOR page....CHECK BOTH IN NAV GPS PRIMARY on PROG page....CHECK AVAILABLE
FMA....CHECK	FMA....CHECK
SLIDING TABLE....STOW	SLIDING TABLE....STOW
All EFB TRANSMITTING MODE....AS RQRD	All EFB TRANSMITTING MODE....AS RQRD
All EFB (with no mounted equipment)....STOW	All EFB (with no mounted equipment)....STOW
THRUST BUMP ....AS RQRD	CABIN CREW....ADVISE
LINE-UP C/L....COMPLETE	LINE-UP C/L....COMPLETE

BEFORE TAKEOFF

Ident.: PRO-NOR-TSK-00024874.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP

PF	PM
	•If the Brake Fans ⊲ are set to ON and the temperature of all brakes is below 150 °C: BRAKE FAN pb....................OFF
	LINE-UP CLEARANCE....................OBTAIN
	TCAS....................TA or TA/RA
TAKEOFF RUNWAY....................CONFIRM	TAKEOFF RUNWAY....................CONFIRM
APPROACH PATH....................CLEAR OF TRAFFIC	APPROACH PATH....................CLEAR OF TRAFFIC
EXTERIOR LIGHTS....................SET	PACKS 1 and 2....................AS RQRD
SLIDING TABLE....................STOW	SLIDING TABLE....................STOW
All EFB TRANSMITTING MODE....................AS RQRD	All EFB TRANSMITTING MODE....................AS RQRD
All EFB (with no mounted equipment)....................STOW	All EFB (with no mounted equipment)....................STOW
THRUST BUMP ⊲ ....AS RQRD	CABIN CREW....................ADVISE
LINE-UP C/L....................COMPLETE	LINE-UP C/L....................COMPLETE

TAKEOFF

Ident.: PRO-NOR-TSK-00024875.0001001 / 09 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

PF	PM
	TAKEOFF CLEARANCE....................OBTAIN
EXTERIOR LIGHTS....................SET	
TAKEOFF....................ANNOUNCE	
THRUST....................50 % N1 (1.05 EPR)	
SIDESTICK....................AS RQRD	
BRAKES....................RELEASE	
THRUST LEVERS....................FLX or TOGA	CHRONO....................START
The Captain places hand on thrust levers until V1	
DIRECTIONAL CONTROL....................USE RUDDER	
	PFD/ND....................MONITOR
•Below 80 kt:	
	TAKEOFF THRUST....................CHECK THRUST SET....................ANNOUNCE PFD and ENG indications....................MONITOR
•At 80 kt:	
SIDESTICK....................RELEASE	
•At 100 kt:	
100 kt....................CROSSCHECK	ONE HUNDRED KNOTS....................ANNOUNCE

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PF	PM
•At V1:	
	V1....................MONITOR or ANNOUNCE
•At VR:	
ROTATION....................PERFORM	ROTATION....................ORDER
•When positive climb:	
	POSITIVE CLIMB....................ANNOUNCE
L/G UP....................ORDER	L/G lever....................SELECT UP
AP....................AS RQRD	
•At the thrust reduction altitude:	
THRUST LEVERS....................CL	PACK 1 and 2 (if applicable)....................ON
•At F speed:	
FLAPS 1....................ORDER	FLAPS 1....................SELECT
•At S speed:	
FLAPS 0....................ORDER	FLAPS 0....................SELECT GND SPLRS....................DISARM L/G....................CHECK UP EXTERIOR LIGHTS....................SET

TAKEOFF

Ident.: PRO-NOR-TSK-00024875.0004001 / 24 NOV 23
Applicable to: LV-KHT, LV-KHU

PF	PM
	TAKEOFF CLEARANCE....................OBTAIN
EXTERIOR LIGHTS....................SET	
TAKEOFF....................ANNOUNCE	
THRUST.................... 1.1 EPR	
SIDESTICK....................AS RQRD	
BRAKES....................RELEASE	
THRUST LEVERS....................FLX or TOGA	CHRONO....................START
The Captain places hand on thrust levers until V1	
DIRECTIONAL CONTROL.................... USE RUDDER	
	PFD/ND....................MONITOR
•Below 80 kt:	
	TAKEOFF THRUST....................CHECK THRUST SET....................ANNOUNCE PFD and ENG indications....................MONITOR
•At 80 kt:	
SIDESTICK....................RELEASE	
•At 100 kt:	
100 kt....................CROSSCHECK	ONE HUNDRED KNOTS....................ANNOUNCE

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PF	PM
•At V1:	
	V1........MONITOR or ANNOUNCE
•At VR:	
ROTATION........PERFORM	ROTATION........ORDER
•When positive climb:	
	POSITIVE CLIMB........ANNOUNCE
L/G UP........ORDER	L/G lever........SELECT UP
AP........AS RQRD	
•At the thrust reduction altitude:	
THRUST LEVERS........CL	PACK 1 and 2 (if applicable)........ON
•At F speed:	
FLAPS 1........ORDER	FLAPS 1........SELECT
•At S speed:	
FLAPS 0........ORDER	FLAPS 0........SELECT GND SPLRS........DISARM L/G........CHECK UP EXTERIOR LIGHTS........SET

AFTER TAKEOFF

Ident.: PRO-NOR-TSK-00024876.0001001 / 09 NOV 21
Applicable to: ALL

PF	PM
	•If the APU was used to supply the air conditioning during takeoff: APU BLEED pb-sw........OFF APU MASTER SW pb-sw........OFF
	ENG START selector........AS RQRD
	•If the takeoff was performed with TA ONLY: TCAS........TA/RA
	ANTI ICE........AS RQRD

CLIMB

Ident.: PRO-NOR-TSK-00024877.0002001 / 28 NOV 23
Applicable to: ALL

PF	PM
MCDU........PERF CLB	MCDU........F-PLN
•At transition altitude: BAROMETRIC REFERENCE........SET STD/CROSSCHECK	
CRZ FL........SET AS RQRD	

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PF	PM
WEATHER RADAR..................ADJUST AS APPROPRIATE	ENG ANTI ICE pb-sw..AS RQRD
•At 10 000 ft AAL:	
	LAND sw...OFF
	SEAT BELTS sw.. AS RQRD
EFIS OPTIONS..AS RQRD	EFIS OPTIONS..AS RQRD
	ECAM MEMO...REVIEW
	NAVAIDS...CLEAR
	SEC F-PLN...AS RQRD
	OPT FL/REC MAX FL...CHECK

CRUISE

Ident.: PRO-NOR-TSK-00024878.0008001 / 24 NOV 23
Applicable to: ALL

PF	PM
ECAM MEMO/SD PAGES.................................... REVIEW	ECAM MEMO/SD PAGES.................................... REVIEW
FLIGHT PROGRESS...CHECK	FLIGHT PROGRESS...CHECK
STEP FLIGHT LEVEL.............................AS APPROPRIATE	STEP FLIGHT LEVEL.............................AS APPROPRIATE
•If GPS PRIMARY LOST:	
NAVIGATION ACCURACY................................. MONITOR	NAVIGATION ACCURACY................................. MONITOR
RADAR................................. ADJUST AS APPROPRIATE	
OXYGEN MASK... CHECK	OXYGEN MASK... CHECK

DESCENT PREPARATION

Ident.: PRO-NOR-TSK-00024879.0001001 / 24 NOV 23
Applicable to: ALL

PF	PM
	WEATHER AND LANDING INFORMATION............ OBTAIN
NAV CHARTS CLIPBOARD...PREPARE	
BAROMETRIC REFERENCE................................PRESET	BAROMETRIC REFERENCE................................PRESET
	STATUS page...CHECK
LANDING CONDITIONS.................................... CONFIRM	LANDING CONDITIONS.................................... CONFIRM
•If landing conditions changed:	
LANDING PERF DATA....................................... COMPUTE	LANDING PERF DATA....................................... COMPUTE
LANDING PERF DATA... CROSSCHECK	
FMS...PREPARE	FMS PREPARATION..................................CROSSCHECK
LDG ELEV... CHECK	
AUTO BRK.. AS RQRD	
ARRIVAL BRIEFING..PERFORM	

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PF	PM
RADAR.......... ADJUST AS APPROPRIATE	
	ANTI ICE pb-sw..........AS RQRD
	DESCENT CLEARANCE..........OBTAIN
CLEARED ALTITUDE ON FCU..........SET	

DESCENT

Ident.: PRO-NOR-TSK-00024880.0005001 / 06 NOV 23
Applicable to: ALL

PF	PM
DESCENT..........INITIATE	
MCDU.......... PROG/PERF DESCENT	MCDU..........F-PLN
DESCENT..........MONITOR/ADJUST	
TERR ON ND.......... AS RQRD	TERR ON ND.......... AS RQRD
•When the aircraft approaches the transition level, and when cleared for an altitude: BAROMETRIC REFERENCE..........SET/CROSSCHECK	
•At 10 000 ft AAL:	
	LAND sw..........ON
	SEAT BELTS sw..........ON
EFIS option pb..........CSTR	EFIS option pb..........CSTR
LS pb.......... AS RQRD	LS pb.......... AS RQRD
NAVAIDS..........AS RQRD/CHECK	ENG START selector.......... AS RQRD
•If GPS PRIMARY LOST:	
NAVIGATION ACCURACY.......... MONITOR	
APPROACH C/L..........COMPLETE	APPROACH C/L..........COMPLETE

APPROACH

Ident.: PRO-NOR-TSK-D-00024881.0001001 / 28 NOV 23
Applicable to: ALL

AIRCRAFT CONFIGURATION FOR APPROACH

PF	PM
INITIAL APPROACH:	
F-PLN SEQUENCING.......... ADJUST	
•Approx 15 NM from touchdown: APPROACH PHASE.......... CHECK/ACTIVATE or set green dot *(1)*	
MANAGED SPEED..........CHECK	
FLIGHT PATH..........MONITOR	NAV ACCURACY.......... MONITOR
SPEED BRAKES lever..........AS RQRD	
RADAR..........ADJUST AS APPROPRIATE	

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AIRCRAFT CONFIGURATION FOR APPROACH

PF	PM
INTERMEDIATE/FINAL APPROACH:	
•At green dot: FLAPS 1..........ORDER	FLAPS 1..........SELECT
	TCAS..........TA or TA/RA
S SPEED..........CHECK or SET (1)	
•At 2 500 ft AGL minimum: FLAPS 2..........ORDER	FLAPS 2..........SELECT
F SPEED..........CHECK or SET(1)	
•When FLAPS 2: L/G DOWN..........ORDER	L/G lever..........SELECT DOWN
	AUTO BRK..........CONFIRM
	GND SPLRS..........ARM
	EXTERIOR LIGHTS..........SET
•When L/G down: FLAPS 3..........ORDER	FLAPS 3..........SELECT
	ECAM WHEEL PAGE..........CHECK
•When FLAPS 3: FLAPS FULL..........ORDER	FLAPS FULL..........SELECT
SPEED TARGET..........CHECK or SET(1)	
	A/THR..........CHECK IN SPEED MODE or OFF
	WING A.ICE (if not required)..........OFF
SLIDING TABLE..........STOW	SLIDING TABLE..........STOW
All EFB (with no mounted equipment)..........STOW	All EFB (with no mounted equipment)..........STOW
	LDG MEMO..........CHECK NO BLUE
CABIN REPORT..........RECEIVE	CABIN REPORT..........RECEIVE
LANDING C/L..........COMPLETE	LANDING C/L..........COMPLETE
	CABIN CREW..........ADVISE
	FLIGHT PARAMETERS..........MONITOR

(1) *PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.*

Ident.: PRO-NOR-TSK-D-00024953.0001001 / 24 NOV 23
Applicable to: ALL

APPROACH USING LOC G/S GUIDANCE

PF	PM
DESCENT PREPARATION:	
APPROACH MINIMUM..........DETERMINE	
ARRIVAL BRIEFING..........PERFORM	

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APPROACH USING LOC G/S GUIDANCE	
PF	**PM**
INITIAL/INTERMEDIATE APPROACH:	
APPR pb on FCU....PRESS	
BOTH AP....ENGAGE	
LOC....CHECK ARMED	
G/S....CHECK ARMED	
LOC CAPTURE....MONITOR	
G/S CAPTURE....MONITOR	
GO-AROUND ALTITUDE....SET(1)	
FINAL APPROACH:	
	FLIGHT PARAMETERS....MONITOR
•At 350 ft RA: LAND mode....CHECK ENGAGED/ANNOUNCE	
For CATI, CATII and CATIII with DH approach: **•At minimum + 100 ft:**	ONE HUNDRED ABOVE....MONITOR or ANNOUNCE
•At minimum: CONTINUE or GO-AROUND....ANNOUNCE	MINIMUM....MONITOR or ANNOUNCE
For CATIII with no DH approach: **•At 200 ft RA:** If no failure detected: CONTINUE....ANNOUNCE	

(1) *PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.*

Ident.: PRO-NOR-TSK-D-00024955.0002001 / 24 NOV 23
Applicable to: ALL

APPROACH USING FINAL APP GUIDANCE	
PF	**PM**
DESCENT PREPARATION:	
	WEATHER AND LANDING INFO....OBTAIN
F-PLN A page....CHECK	F-PLN A page....CHECK
PROG page....COMPLETE	PROG page....COMPLETE
GO-AROUND STRATEGY....REVIEW	
DESCENT:	
•At 10 000 ft AAL: NAV ACCURACY....CHECK	
•For RNAV(GNSS): GPS PRIMARY....CHECK	

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APPROACH USING FINAL APP GUIDANCE

PF	PM
BAROMETRIC REFERENCE...............SET/CROSSCHECK	BAROMETRIC REFERENCE...............SET/CROSSCHECK
INITIAL/INTERMEDIATE/FINAL APPROACH:	
POSITION...MONITOR	
APPR pb on FCU...PRESS	
APP NAV...........................CHECK ARMED OR ENGAGED	
FINAL...CHECK ARMED	
•At Final Descent Point: FINAL APP..CHECK ENGAGED	
GO-AROUND ALTITUDE...SET[1]	
	FLIGHT PARAMETERS......................................MONITOR
•At minimum + 100 ft:	ONE HUNDRED ABOVE.............MONITOR or ANNOUNCE
•At minimum: CONTINUE OR GO-AROUND..........................ANNOUNCE	MINIMUM....................................MONITOR or ANNOUNCE

[1] *PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.*

Ident.: PRO-NOR-TSK-D-00024956.0006001 / 24 FEB 23
Applicable to: LV-KAN, LV-KAO

APPROACH USING FINAL APP GUIANCE FOR RNAV(RNP)

PF	PM
DESCENT PREPARATION:	
	WEATHER AND LANDING INFO.............................OBTAIN
F-PLN A page..CHECK	F-PLN A page..CHECK
PROG page...COMPLETE	PROG page...COMPLETE
GO-AROUND STRATEGY......................................REVIEW	
DESCENT:	
GPS PRIMARY ON BOTH FMS................................CHECK	
GPS 1+2..................... CHECK BOTH IN NAV or SBAS	
TERR ON ND..ON	TERR ON ND..ON
INITIAL/INTERMEDIATE/FINAL APPROACH:	
BAROMETRIC REFERENCE...............SET/CROSSCHECK	BAROMETRIC REFERENCE...............SET/CROSSCHECK
FD or AP/FD.................................... USE FOR APPROACH	
L/DEV...CHECK DISPLAYED	
APPR pb on FCU..PRESS	
APP NAV...........................CHECK ARMED OR ENGAGED	
FINAL...CHECK ARMED	

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APPROACH USING FINAL APP GUIANCE FOR RNAV(RNP)

PF	PM
•At the Final Descent Point: FINAL APP.. CHECK ENGAGED	
GO-AROUND ALTITUDE...SET(1)	
	FLIGHT PARAMETERS.......................................MONITOR
•At minimum + 100 ft:	ONE HUNDRED ABOVE.............MONITOR or ANNOUNCE
•At minimum: CONTINUE or GO-AROUND.............................ANNOUNCE	MINIMUM................................... MONITOR or ANNOUNCE

(1) *PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.*

Ident.: PRO-NOR-TSK-D-00024956.0002001 / 24 FEB 23
Applicable to: LV-KHT, LV-KHU

APPROACH USING FINAL APP GUIDANCE FOR RNAV(RNP)

PF	PM
DESCENT PREPARATION:	
	WEATHER AND LANDING INFO.............................OBTAIN
F-PLN A page..CHECK	F-PLN A page..CHECK
PROG page.. COMPLETE	PROG page...COMPLETE
GO-AROUND STRATEGY.......................................REVIEW	
DESCENT:	
GPS PRIMARY ON BOTH FMS ....CHECK	
GPS 1+2......................CHECK BOTH IN NAV or SBAS	
TERR ON ND...ON	TERR ON ND...ON
INITIAL/INTERMEDIATE/FINAL APPROACH:	
BAROMETRIC REFERENCE............... SET/CROSSCHECK	BAROMETRIC REFERENCE...............SET/CROSSCHECK
FD or AP/FD................................... USE FOR APPROACH	
APPR pb on FCU...PRESS	
APP NAV...........................CHECK ARMED OR ENGAGED	
FINAL..CHECK ARMED	
•At the Final Descent Point: FINAL APP...CHECK ENGAGED	
GO-AROUND ALTITUDE...SET(1)	
	FLIGHT PARAMETERS.......................................MONITOR
•At minimum + 100 ft:	ONE HUNDRED ABOVE............ MONITOR or ANNOUNCE

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APPROACH USING FINAL APP GUIDANCE FOR RNAV(RNP)

PF	PM
•At minimum:	
CONTINUE or GO-AROUND............................ANNOUNCE	MINIMUM.................................. MONITOR or ANNOUNCE

(1) *PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.*

Ident.: PRO-NOR-TSK-D-00024957.0002001 / 24 NOV 23
Applicable to: ALL

APPROACH USING FPA GUIDANCE

PF	PM
DESCENT PREPARATION:	
F-PLN A Page.. CHECK	F-PLN A Page...CHECK
PROG Page... COMPLETE	PROG Page...COMPLETE
GO-AROUND STRATEGY..................................... REVIEW	
DESCENT:	
•At 10 000 ft AAL: NAV ACCURACY... CHECK	
•For RNAV(GNSS): GPS PRIMARY .... CHECK	
BAROMETRIC REFERENCE................SET/CROSSCHECK	BAROMETRIC REFERENCE............. SET/CROSSCHECK
INITIAL/INTERMEDIATE/FINAL APPROACH:	
LATERAL GUIDANCE MODE............SET FOR APPROACH	
•For LOC ONLY, ILS G/S OUT and back course localizer approaches: LOC pb-sw..PRESS LOC/LOC B/C... CHECK ARMED	
LATERAL path..INTERCEPT	
TRK FPA (Bird)...SELECT	
FPA FOR FINAL APPROACH..SET	
•At 0.3 NM from the Final Descent Point: FPA selector...PULL	
FPA...CHECK ENGAGED	
POSITION/FLT PATH............................ MONITOR/ADJUST	
GO-AROUND ALTITUDE...SET(1)	
	FLIGHT PARAMETERS...................................... MONITOR
•At minimum +100 ft:	
	ONE HUNDRED ABOVE............MONITOR or ANNOUNCE

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APPROACH USING FPA GUIDANCE

PF	PM
•At minimum:	
CONTINUE or GO-AROUND............................ ANNOUNCE	MINIMUM..................................MONITOR or ANNOUNCE

(1) *PF if AP is ON, PM if AP is OFF. The PF may request that this action is performed by the PM depending on the situation.*

MANUAL LANDING

Ident.: PRO-NOR-TSK-00024887.0015001 / 24 NOV 23
Applicable to: LV-GIF

PF	PM
AP..OFF	
•Around 40 ft RA:	
FLARE...PERFORM	ATTITUDE... MONITOR
ALL THRUST LEVERS...IDLE	
•At touchdown:	
DEROTATION...INITIATE	
ALL REVERSER LEVERS...............REV MAX or REV IDLE	GND SPLRS.......................................CHECK/ANNOUNCE
	REVERSERS.....................................CHECK/ANNOUNCE
DIRECTIONAL CONTROL...................................ENSURE	
•If autobrake is selected:	
	AUTO BRK.. CHECK/ANNOUNCE
	AUTO BRK.. MONITOR
•If landing without autobrake:	
BRAKES... AS RQRD	
	DECELERATION.................................CHECK/ANNOUNCE
•At 70 kt:	
	SEVENTY KNOTS..ANNOUNCE
ALL REVERSER LEVERS...IDLE	
•At taxi speed:	
ALL REVERSER LEVERS..STOW	
•Before 20 kt:	
AUTO BRK... DISENGAGE	

MANUAL LANDING

Ident.: PRO-NOR-TSK-00024887.0003001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

PF	PM
AP........................OFF	
•Around 40 ft RA:	
FLARE........................PERFORM	ATTITUDE........................MONITOR
ALL THRUST LEVERS........................IDLE	
•At touchdown:	
DEROTATION........................INITIATE	
ALL REVERSER LEVERS...............REV MAX or REV IDLE	GND SPLRS........................CHECK/ANNOUNCE
	REVERSERS........................CHECK/ANNOUNCE
DIRECTIONAL CONTROL........................ENSURE	
•If autobrake is selected:	
	AUTO BRK........................MONITOR
•If landing without autobrake:	
BRAKES........................AS RQRD	
	DECELERATION........................CHECK/ANNOUNCE
•At 70 kt:	
	SEVENTY KNOTS........................ANNOUNCE
ALL REVERSER LEVERS........................IDLE	
•At taxi speed:	
ALL REVERSER LEVERS........................STOW	
•Before 20 kt:	
AUTO BRK........................DISENGAGE	

AUTOMATIC LANDING

Ident.: PRO-NOR-TSK-00024888.0001001 / 24 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

PF	PM
•At 350 ft RA:	
LAND on FMA........................CHECK/ANNOUNCE	
ILS/GLS ◁ COURSE........................CHECK	
•At 40 ft RA:	
	FLARE on FMA........................CHECK/ANNOUNCE
FLARE........................MONITOR	
•At 30 ft RA:	
	THR IDLE on FMA........................CHECK
	THR IDLE........................CHECK
•At 10 ft RA: "Retard"	
ALL THRUST LEVERS........................IDLE	
LATERAL GUIDANCE........................MONITOR	

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PF	PM
•At touchdown:	
	ROLL OUT on FMA....CHECK/ANNOUNCE
ALL REVERSER LEVERS....REV MAX or REV IDLE	GND SPLRS ....CHECK/ANNOUNCE
	REVERSERS....CHECK/ANNOUNCE
DIRECTIONAL CONTROL....MONITOR/ENSURE	
•If autobrake is selected:	
	AUTO BRK....MONITOR
•If landing without autobrake:	
BRAKES....AS RQRD	
	DECELERATION....CHECK/ANNOUNCE
•At 70 kt:	
	SEVENTY KNOTS....ANNOUNCE
ALL REVERSER LEVERS....REV IDLE	
•Before 20 kt:	
AUTO BRK....DISENGAGE	
•End of roll out:	
ALL REVERSER LEVERS....STOW	
AP....OFF	

AUTOMATIC LANDING

Ident.: PRO-NOR-TSK-00024888.0017001 / 24 NOV 23
Applicable to: LV-GIF

PF	PM
•At 350 ft RA:	
LAND on FMA....CHECK/ANNOUNCE	
ILS/GLS ◁ COURSE....CHECK	
•At 40 ft RA:	
	FLARE on FMA....CHECK/ANNOUNCE
FLARE....MONITOR	
•At 30 ft RA:	
	THR IDLE on FMA....CHECK
	THR IDLE....CHECK
•At 10 ft RA: "Retard"	
ALL THRUST LEVERS....IDLE	
LATERAL GUIDANCE....MONITOR	
•At touchdown:	
	ROLL OUT on FMA....CHECK/ANNOUNCE
ALL REVERSER LEVERS....REV MAX or REV IDLE	GND SPLRS ....CHECK/ANNOUNCE
	REVERSERS....CHECK/ANNOUNCE
DIRECTIONAL CONTROL....MONITOR/ENSURE	

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PF	PM
•If autobrake is selected:	
	AUTO BRK...CHECK/ANNOUNCE
	AUTO BRK...MONITOR
•If landing without autobrake:	
BRAKES.. AS RQRD	
	DECELERATION.................................CHECK/ANNOUNCE
•At 70 kt:	
	SEVENTY KNOTS...ANNOUNCE
ALL REVERSER LEVERS.................................... REV IDLE	
•Before 20 kt:	
AUTO BRK..DISENGAGE	
•End of roll out:	
ALL REVERSER LEVERS... STOW	
AP...OFF	

GO AROUND

Ident.: PRO-NOR-TSK-00024889.0001001 / 09 NOV 21
Applicable to: ALL

PF	PM
•Simultaneously apply the following three actions:	
THRUST LEVERS..TOGA	
ROTATION.. PERFORM	FLIGHT PARAMETERS.......................................MONITOR
GO-AROUND...ANNOUNCE	FLAPS..RETRACT ONE STEP
FMA..CHECK/ANNOUNCE	
	POSITIVE CLIMB.. ANNOUNCE
L/G UP...ORDER	L/G...UP
NAV or HDG..AS RQRD	GO-AROUND ALTITUDE... CHECK
•At go-around thrust reduction altitude:	
THRUST LEVERS..CL	
•At go-around acceleration altitude:	
SPEED TARGET...MONITOR	
•AT F SPEED:	
FLAPS 1...ORDER	FLAPS 1... SELECT
•AT S SPEED:	
FLAPS 0...ORDER	FLAPS 0...SELECT
	GND SPLRS...DISARM
	L/G..CHECK UP
	EXTERIOR LIGHTS...SET

AFTER LANDING

Ident.: PRO-NOR-TSK-00024890.0001001 / 09 NOV 21
Applicable to: ALL

PF	PM
GND SPLRS.....DISARM	
EXTERIOR LIGHTS.....SET	
	RADAR.....OFF
	PREDICTIVE WINDSHEAR.....OFF
	ENG START selector.....NORM
	FLAPS.....RETRACT
	TCAS.....STBY
	ATC.....AS RQRD
	APU.....START
	ANTI ICE.....AS RQRD
	BRAKE TEMPERATURE.....MONITOR
	BRAKE FAN pb.....AS RQRD
AFTER LANDING C/L.....COMPLETE	AFTER LANDING C/L.....COMPLETE

PARKING

Ident.: PRO-NOR-TSK-00024891.0001001 / 24 NOV 23
Applicable to: ALL

PF	PM
ACCU PRESS.....CHECK	ANTI-ICE.....OFF
PARK BRK handle.....ON	APU BLEED pb-sw.....ON
BRAKES PRESS indicator.....CHECK	
ALL ENG MASTER levers.....OFF	
ENGINE PARAMETERS.....CHECK	
WING sw.....OFF	
BEACON sw.....OFF	
OTHER EXTERIOR LIGHTS.....AS RQRD	FUEL PUMPS.....OFF
SLIDES .....CHECK DISARMED	ATC.....STBY
SEAT BELTS sw.....OFF	IRS PERFORMANCE.....CHECK
GROUND CONTACT.....ESTABLISH	FUEL QUANTITY.....CHECK
PARK BRK handle.....AS RQRD	BRAKE FAN pb.....AS RQRD
PARKING C/L.....COMPLETE	PARKING C/L.....COMPLETE
HUD .....STOW	HUD .....STOW
LOGBOOK.....COMPLETE (CM1)	
All EFB TRANSMITTING MODE.....AS RQRD	All EFB TRANSMITTING MODE.....AS RQRD

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PF	PM
•If performing transit stop: CLEAR/CLOSE FLIGHT.......................................APPLY	**•If performing transit stop:** CLEAR/CLOSE FLIGHT.......................................APPLY
DUs...DIM	DUs...DIM

SECURING THE AIRCRAFT

Ident.: PRO-NOR-TSK-00024892.0001001 / 24 NOV 23
Applicable to: ALL

CM1	CM2
PARK BRK handle...ON	OXYGEN CREW SUPPLY pb....................................... OFF
All IR MODE selectors...OFF	EXTERIOR LIGHTS..OFF
	GND SELECT CTL sw.. AS RQRD
	APU BLEED pb-sw...OFF
	EXT PWR pb.. AS RQRD
	APU MASTER SW pb-sw...OFF
	EMER EXIT LT sw..OFF
	SIGNS sw..OFF
	BAT 1 pb-sw + BAT 2 pb-sw + APU BAT pb-sw.............OFF
WINDOWS...CHECK CLOSED	WINDOWS...CHECK CLOSED
SECURING THE AIRCRAFT C/L......................COMPLETE	SECURING THE AIRCRAFT C/L......................COMPLETE
EFB applications...CLOSE	
All EFB... SWITCH OFF	

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SUPPLEMENTARY PROCEDURES

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020188.0002001 / 04 JUL 17
Applicable to: LV-KHT, LV-KHU

ADVERSE WEATHER

- [SUP] AIRFRAME DEICING/ANTI-ICING PROCEDURE ON GROUND (*Refer to procedure*)
- [SUP] ENGINE ICE SHEDDING ON GROUND (*Refer to procedure*)
- [SUP] GROUND OPERATIONS IN COLD WEATHER CONDITIONS (*Refer to procedure*)
- [SUP] MINIMUM SPEED WITH ICE ACCRETION (*Refer to procedure*)
- [SUP] OPERATIONS ON CONTAMINATED AIRPORTS (*Refer to procedure*)
- [SUP] OPERATIONS WITH VOLCANIC ASH, SAND OR DUST (*Refer to procedure*)
- [SUP] SECURING THE AIRCRAFT FOR COLD SOAK (*Refer to procedure*)
- [SUP] WATER SYSTEM DEPRESSURIZATION OR DRAINING (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020188.0001001 / 05 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ADVERSE WEATHER

- [SUP] AIRFRAME DEICING/ANTI-ICING PROCEDURE ON GROUND (*Refer to procedure*)
- [SUP] ENGINE OPERATIONS ON GROUND IN ICING CONDITIONS (*Refer to procedure*)
- [SUP] GROUND OPERATIONS IN COLD WEATHER CONDITIONS (*Refer to procedure*)
- [SUP] MINIMUM SPEED WITH ICE ACCRETION (*Refer to procedure*)
- [SUP] OPERATIONS ON CONTAMINATED AIRPORTS (*Refer to procedure*)
- [SUP] OPERATIONS WITH VOLCANIC ASH, SAND OR DUST (*Refer to procedure*)
- [SUP] SECURING THE AIRCRAFT FOR COLD SOAK (*Refer to procedure*)
- [SUP] WATER SYSTEM DEPRESSURIZATION OR DRAINING (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020198.0002001 / 10 NOV 20
Applicable to: ALL

ENGINE

- [SUP] MANUAL ENGINE START (*Refer to procedure*)
- [SUP] ENGINE START WITH AN AIR START UNIT (*Refer to procedure*)
- [SUP] CROSSBLEED ENGINE START (*Refer to procedure*)
- [SUP] ENGINE START WITH EXTERNAL ELECTRICAL POWER (*Refer to procedure*)
- [SUP] ENGINE START ON BATTERIES (*Refer to procedure*)
- [SUP] ENGINE START VALVE MANUAL OPERATION (*Refer to procedure*)
- [SUP] ENGINE VENTILATION (DRY CRANKING) (*Refer to procedure*)
- [SUP] ONE ENGINE TAXI (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020199.0001001 / 17 MAR 17
Applicable to: ALL

FUEL

[SUP] REFUELING (*Refer to procedure*)
[SUP] DEFUELING (*Refer to procedure*)
[SUP] GROUND FUEL TRANSFER (*Refer to procedure*)
[SUP] REFUELING WITH ONE ENGINE RUNNING (*Refer to procedure*)
[SUP] FROST REDUCTION ON THE UPPER WING SURFACES ABOVE THE OUTER TANKS (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00025220.0001001 / 26 JAN 22
Applicable to: ALL

GPS INTERFERENCES

[SUP] GPS INTERFERENCES (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020201.0001001 / 17 NOV 20
Applicable to: ALL

LANDING GEAR

[SUP] OPERATION WITH NOSEWHEEL STEERING OFFSET (*Refer to procedure*)
[SUP] FLIGHT WITH GEAR DOWN (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020204.0001001 / 17 MAY 21
Applicable to: LV-GKO, LV-GKP

MISCELLANEOUS

[SUP] FLIGHT WITHOUT CABIN PRESSURIZATION (*Refer to procedure*)
[SUP] HIGH ALTITUDE AIRPORT OPERATIONS (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00020204.0005001 / 17 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MISCELLANEOUS

[SUP] FLIGHT WITHOUT CABIN PRESSURIZATION (*Refer to procedure*)
[SUP] HIGH ALTITUDE AIRPORT OPERATIONS (*Refer to procedure*)
[SUP] OPERATIONS AT QNH ABOVE 1050 HPA (*Refer to procedure*)

Ident.: PRO-NOR-SUP-SUP-SUP-00-00021385.0003001 / 09 NOV 17
Applicable to: ALL

SURVEILLANCE

[SUP] AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B) (*Refer to procedure*)
[SUP] ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS) (*Refer to procedure*)

AIRFRAME DEICING/ANTI-ICING PROCEDURE ON GROUND

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-D-00020536.0033001 / 28 MAY 20

BEFORE FLUID SPRAYING

In all situations, it is responsibility of the captain to decide if the ground crew must deice/anti-ice the aircraft, and/or if additional deicing/anti-icing treatment are required.

CAUTION
- Make sure that the low or high-pressure ground connectors do not supply any external air to the aircraft.
- If it is necessary for the ground crew to repeatedly anti-ice the aircraft, they must deice the surfaces with a hot fluid mixture before applying a new layer of anti-icing fluid.

COMMUNICATION WITH GROUND CREW..ESTABLISH

L2 *Establish communication with the crew that will apply the procedure.*

L1 DEICING/ANTI-ICING FLUIDS TYPE...CHECK APPROPRIATE

L2 *Check that the ground crew uses the correct deicing/anti-icing fluids, in accordance with the applicable operator requirements and AMM.*

L1 DO NOT START THE ENGINES DURING FLUID SPRAYING

L2 *Engines and APU can be either stopped or running during deicing/anti-icing.*

L1

CAUTION
- The ground crew should take care when spraying deicing fluid, and make sure that the engines and APU do no ingest any fluid.
- Do not move flaps, slats, ailerons, spoilers or elevators if they are not free of ice.
- Always ensure that both left and right side of the aircraft receive the same complete and symmetrical deicing/anti-icing treatment.

Note: *In case of frost formation on one or several areas of the wing, the Captain can request a local deicing application only on the affected areas. The Captain shall take care that both wings receive the same symmetrical treatment, even if frost formation does not affect both wing symmetrically. For more information, refer to AMM.*

CABIN PRESS MODE SEL..CHECK AUTO
ENG 1 BLEED...OFF
ENG 2 BLEED...OFF

Note: *If both engines are running, the AIR ENG 1+2 BLEED FAULT alert triggers when both ENG BLEED pb-sw are set to OFF. If this occurs, disregard this alert.*

APU BLEED...OFF

DITCHING pb.. ON

L2 *Outflow valves, pack flow control valves, avionics ventilation overboard valve close.*
This prevents de-icing fluid from entering the aircraft. Avionics ventilation is provided by operating cabin fans, since air blows to the inboard valve. Considering the low OAT, there is no time limitation associated with this configuration.

L1 *Note:* 1. *The CAB PR FWD OFV NOT OPEN, CAB PR AFT OFV NOT OPEN, and COND LAV + GAL VENT FAULT alerts trigger. Disregard these alerts.*
2. *For passenger comfort reason, it is not recommended to operate on ground with both PACKS set to OFF for more than 20 min.*

THRUST LEVERS..CHECK IDLE
“AIRCRAFT PREPARED FOR SPRAYING”.. INFORM GROUND CREW

Ident.: PRO-NOR-SUP-ADVWXR-D-00002032.0003001 / 05 MAR 19

UPON COMPLETION OF THE SPRAYING OPERATION

PITOTS AND STATICS (ground crew)..CHECK

CAUTION	When the OAT is low (below -5 °C) during snow/freezing rain precipitations and with crosswind conditions, melted snow or raindrops may drip from the cockpit windshields and freeze on the fuselage below. Ice may then build up and possibly disturb the airflow around the static/pitot/angle-of-attack probes, and result in unreliable air data measurements during takeoff. Therefore during taxi out before takeoff beware of this possible build up of ice. The area around static/pitot/angle-of-attack probes must be free of ice/snow before starting takeoff.

GROUND EQUIPMENT.. REMOVE
DE-ICING/ANTI-ICING REPORT.. RECEIVED

The information from ground personnel who performed the de-icing and post-application check must include (ANTI-ICING CODE):
- *The type of fluid used*
- *The ratio of fluid to water (e.g. 75/25)*
- *The time of the holdover beginning*
- *The result of post-application check "Aircraft critical parts are clean".*

DITCHING pushbutton..OFF
OUTFLOW VALVE..CHECK OPEN

On the ECAM PRESS page, confirm that the outflow valve indication reaches the open green position to avoid any unexpected aircraft pressurization.

CAUTION	*If spraying is performed with the engines not running, a small negative cabin delta P may appear for a short time, just after selecting the ditching pushbutton to OFF. During this time, do not open any doors or windows.*

- **At least 1 minute after completion of spraying operations:**

  ENG 1 BLEED...ON
  ENG 2 BLEED...ON

- **At least 5 minutes after completion of spraying operation:**

  APU BLEED...AS RQRD

  Note: *There is a risk of de-icing fluid ingestion by the APU air intake, resulting in specific odors, or smoke warnings. Therefore:*

  - *Keep the APU running with the APU BLEED OFF for 5 min after spraying completion before setting the APU BLEED to ON (if required),*
  - *Consider APU BLEED OFF for takeoff.*

NORMAL PROCEDURE...RESUME

Apply appropriate normal procedures. Pay special attention to the flight control check. In freezing precipitation, perform the appropriate checks to evaluate aircraft icing. Base the decision on whether to takeoff, or to re-protect the aircraft, on the amount of ice that has built up on the critical surfaces since the last de-icing, as revealed by a personal inspection from the inside and outside of the aircraft. Make this inspection before the holdover time expires, or just before takeoff.

ENGINE ICE SHEDDING ON GROUND

Ident.: PRO-NOR-SUP-ADVWXR-00009179.0006001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

INTRODUCTION

During taxi in icing conditions, for temperatures below +1 °C (34 °F), ice accretion may affect the fan and core engine parts.

The following two procedures have been developed for shedding ice:
- The first is applicable for shedding ice that has built up on the fan:
  - When freezing fog is not present, or
  - When the engines are operated on ground at idle, for less than 45 min (cumulative previous flight taxi-in plus taxi-out times), in the presence of freezing fog.
- The second is applicable for shedding ice that has built up on the fan, and in the core engine:
  - When freezing fog is present, and
  - When the engines are expected to operate on ground at idle, for more than 45 min. This case is covered by below-mentioned procedures A, B, or C.

In presence of freezing fog and if no core ice shedding was applied: record a specific entry in the Logbook with the engine total ground running time (including taxi-in and taxi-out time) when it is longer than 30 min.

PROCEDURES

CAUTION	If this procedure is not applied, potential adverse engine deterioration may occur.

TAXI-IN

The logbook must be used to record the taxi-in time in freezing fog, in order to be able to determine the remaining taxi-out time, allowed for the next flight.

TURNAROUND

If it is anticipated that the maximum available taxi time of 45 min will be exceeded before the next takeoff, it is recommended to request that maintenance personnel apply Procedure “C” (see below) during the turnaround. This will allow the use of the maximum allowed taxi time (45 min) during the next taxi-out.

TAXI-OUT

The following procedures are also summarized in the flow chart below:

● **If icing conditions have been identified, without freezing fog:**

During ground operations, when in icing conditions at idle and the OAT is below +1 °C (34 °F), apply the following procedure to shed any possible ice on the fan:

CAUTION	If, during thrust increase, the aircraft starts to move, immediately retard the thrust levers to IDLE.

If ground surface conditions and the environment permit, accelerate the engines to not less than 50 % of N1 for 10 s at intervals not greater than 1 h.

In addition, perform this engine acceleration also just before take-off, with particular attention to engine parameters to ensure normal engine operation.

- **If icing conditions have been identified, with freezing fog:**

  It is recommended to check with the ATC, to determine if the takeoff can be performed within the total allowed taxi time of 45 min.

  - **If the total taxi time is shorter than 45 min:**

    It is only necessary to shed fan ice. This can be achieved by applying the above-mentioned ice shedding procedure.

  - **If the total taxi time is expected to be longer than 45 min:**

    Before reaching 45 min of cumulative taxi time, apply the following procedure:

■ **Procedure A: If -7 °C (19 °F) < OAT <1 °C (34 °F) and below 45 min of cumulative taxi time**

ATC..INFORM
PARKING BRAKE (or brake with pedals)..ON

CAUTION	If, during thrust increase, the aircraft starts to move, immediately retard the thrust levers to IDLE.

THRUST LEVERS..50 % N1

If ground surface condition and the environment permit, accelerate engines not less than 50 % N1 for 1 min.

Procedure “A”..Record in the LOGBOOK

■ **Procedure B: If -20 °C (-4 °F) < OAT ≤ -7 °C (19 degrees F) and below 45 min of cumulative taxi time**

ATC..INFORM
PARKING BRAKE (or brake with pedals)..ON

CAUTION	If, during thrust increase, the aircraft starts to move, immediately retard the thrust levers to IDLE.

THRUST LEVERS..70 % N1

If ground surface conditions and the environment permit, accelerate the engines one after the other, each not less than 70 % N1 for 50 s.

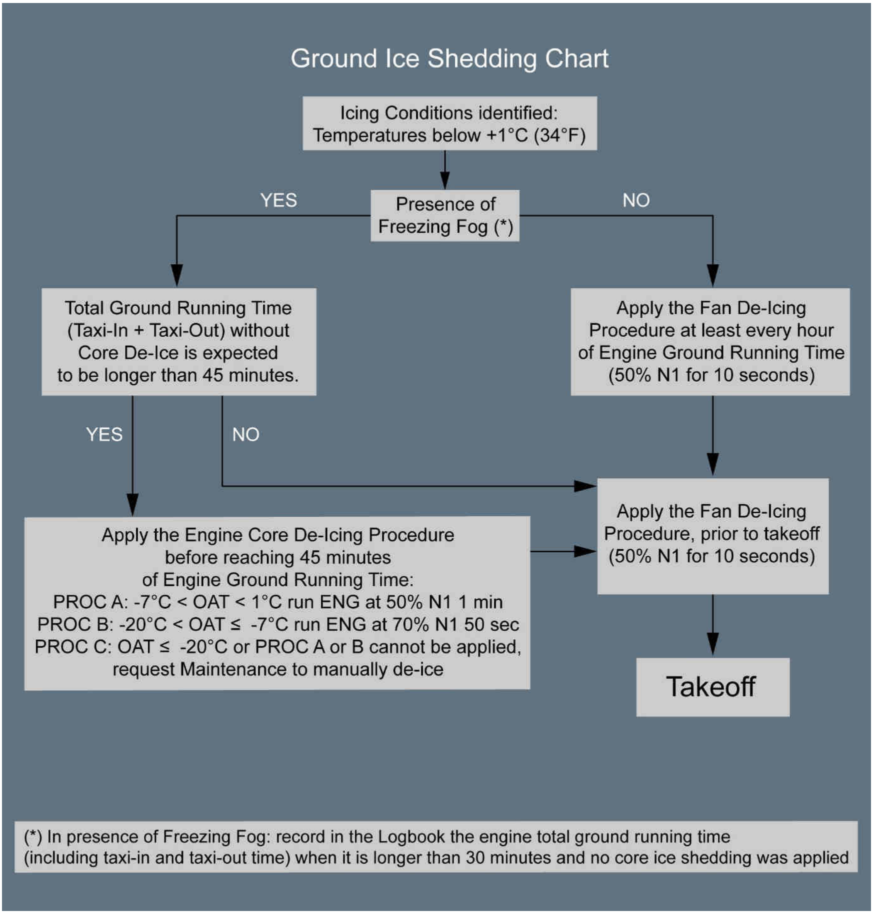
Procedure “B”..Record in the LOGBOOK

■ **Procedure C : If OAT ≤ -20 °C (-4 °F), or if procedures “A” or “B” cannot be applied (ground surface conditions or the environment do not permit the application of the procedures), or if the cumulative taxi time has exceeded 45 min:**

Request that maintenance:

- Inspect the Variable Inlet Guide Vanes (VIGV) for ice, and
- If necessary, manually de-ice the core engine.

In accordance with the "Cold Weather Maintenance - Maintenance Practice to Manually De-Ice the Core Engine" section of the Aircraft Maintenance Manual.


Ground Ice Shedding Chart
Icing Conditions identified:
Temperatures below +1°C (34°F)
Presence of Freezing Fog (*)
YES
NO
Total Ground Running Time (Taxi-In + Taxi-Out) without Core De-Ice is expected to be longer than 45 minutes.
Apply the Fan De-Icing Procedure at least every hour of Engine Ground Running Time (50% N1 for 10 seconds)
YES
NO
Apply the Engine Core De-Icing Procedure before reaching 45 minutes of Engine Ground Running Time:
PROC A: -7°C < OAT < 1°C run ENG at 50% N1 1 min
PROC B: -20°C < OAT ≤ -7°C run ENG at 70% N1 50 sec
PROC C: OAT ≤ -20°C or PROC A or B cannot be applied, request Maintenance to manually de-ice
Apply the Fan De-Icing Procedure, prior to takeoff (50% N1 for 10 seconds)
Takeoff

(*) In presence of Freezing Fog: record in the Logbook the engine total ground running time (including taxi-in and taxi-out time) when it is longer than 30 minutes and no core ice shedding was applied

ENGINE OPERATIONS ON GROUND IN ICING CONDITIONS

Ident.: PRO-NOR-SUP-ADVWXR-00025943.0002001 / 12 MAY 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

INTRODUCTION

CAUTION	During engine operations on ground in icing conditions, and with the OAT at +3 °C (37 °F) or below, ice accretion may affect the engine fan blades, spinner, or stators of the low pressure compressor. Apply the following engine ice shedding procedure to prevent possible engine degradation or damage.

The quantity of ice accretion depends on the time during which the engine is running on ground in the above-mentioned icing conditions.
This procedure involves the performance of engine accelerations before the end of specific time intervals, or if the engine vibrations increase during taxi.

PRELIMINARY COCKPIT PREPARATION

● **If the engines are operated on ground in icing conditions with the OAT at +3 °C (37 °F) or below:**

LOGBOOK...CHECK

Note: *Check the taxi-in time of the previous flight in icing conditions with the OAT at + 3 °C (37 °F) or below recorded in the logbook.*

MAXIMUM TIME TO NEXT ENGINE ACCELERATION..........................DETERMINE

- *The maximum time to next engine acceleration is the difference between 30 min and the taxi-in time of the previous flight recorded in the logbook*
- *If there is freezing rain, freezing drizzle, freezing fog, or heavy snow, the maximum time to next engine acceleration is the difference between 10 min and the taxi-in time of the previous flight recorded in the logbook*
- *Disregard the taxi-in time of the previous flight if a maintenance task to deice the engines is performed before engine start.*

SOP PRELIMINARY COCKPIT PREPARATION.................................RESUME

TAXI-OUT

TAXI TIME...MONITOR

Perform the following procedure before the taxi time reaches the maximum time to next engine acceleration, or if the engine vibrations increase.

WARNING	Before and during the application of the procedure, ensure that the jet blast due to the increased thrust does not result in any hazard to people or installations behind the aircraft.

GND SURFACE COND & AREA....................CHECK
ATC....................NOTIFY
PARKING BRAKE....................ON

CAUTION	Pay special attention to the aircraft movement during this procedure. If during thrust increase the aircraft starts to move, immediately retard the thrust levers to IDLE.

CAUTION	If the ground surface conditions or the area behind the aircraft do not permit to accelerate up to 60 % N1, then the thrust setting and the hold time should be as high as possible.

■ **If in icing conditions with the OAT at +3 °C (37 °F) or below:**

THR LEVERS....................60 % N1 for 30 s
THR LEVERS....................RETARD TO IDLE

Repeat this procedure at intervals not longer than 30 min, or if the engine vibrations increase.

■ **If in icing conditions with the OAT at + 3 °C (37 °F) or below and if there is freezing rain, freezing drizzle, freezing fog, or heavy snow:**

THR LEVERS....................60 % N1 (NO HOLD TIME)
THR LEVERS....................RETARD TO IDLE

Repeat this procedure at intervals not longer than 10 min, or if the engine vibrations increase.

SOP TAXI....................RESUME

BEFORE TAKEOFF

LINE UP CLEARANCE

A final engine acceleration must be performed before takeoff to entirely clean the engine from ice accretion.

ATC....................NOTIFY

L2 *Inform ATC that an engine procedure will be performed after line up.*

L1 **DO NOT PERFORM ROLLING TAKEOFF**

L2 *The following procedure must be performed after alignment, with the aircraft stopped.*

L1 SOP BEFORE TAKEOFF....................RESUME

TAKEOFF

AFTER LINE UP

PARKING BRAKE (OR BRAKE WITH PEDALS)....................APPLY

L2 *Apply braking with the pedals or the parking brake, as required.*

L1

CAUTION	Pay special attention to the aircraft movement during this procedure. If during thrust increase the aircraft starts to move, immediately retard the thrust levers to IDLE.

- ■ **If in icing conditions with the OAT at +3 °C (37 °F) or below:**
  THR LEVERS....................60 % N1 for 30 s
  THR LEVERS....................RETARD TO IDLE
- ■ **If in icing conditions with the OAT at + 3 °C (37 °F) or below and if there is freezing rain, freezing drizzle, freezing fog, or heavy snow:**
  THR LEVERS....................60 % N1 (NO HOLD TIME)
  THR LEVERS....................RETARD TO IDLE

SOP TAKEOFF....................RESUME

AFTER LANDING

TAXI-IN TIME....................MONITOR

Perform the following procedure when in icing conditions with the OAT at + 3 °C (37 °F) or below:

- If the engine vibrations increase, or
- At the latest when the taxi-in time reaches:
  - 30 min, or
  - 10 min, if there is freezing rain, freezing drizzle, freezing fog, or heavy snow.

WARNING	Before and during the application of the procedure, ensure that the jet blast due to the increased thrust does not result in any hazard to people or installations behind the aircraft.

GND SURFACE COND & AREA....................CHECK
ATC....................NOTIFY
PARKING BRAKE....................ON

CAUTION	Pay special attention to the aircraft movement during this procedure. If during thrust increase the aircraft starts to move, immediately retard the thrust levers to IDLE.

CAUTION	If the ground surface conditions or the area behind the aircraft do not permit to accelerate up to 60 % N1, then the thrust setting and the hold time should be as high as possible.

- **If in icing conditions with the OAT at +3 °C (37 °F) or below:**

  THR LEVERS....60 % N1 for 30 s
  THR LEVERS....RETARD TO IDLE

  Repeat this procedure at intervals not longer than 30 min, or if the engine vibrations increase.

- **If in icing conditions with the OAT at + 3 °C (37 °F) or below and if there is freezing rain, freezing drizzle, freezing fog, or heavy snow:**

  THR LEVERS....60 % N1 (NO HOLD TIME)
  THR LEVERS....RETARD TO IDLE

  Repeat this procedure at intervals not longer than 10 min, or if the engine vibrations increase.

SOP AFTER LANDING....RESUME

PARKING

TAXI-IN TIME....RECORD IN THE LOGBOOK

L2 *Record the taxi-in time in icing conditions with OAT at +3 °C (37 °F) or below, or the taxi-in time after last engine acceleration if performed. This time is used to determine the maximum time to next engine acceleration for the next flight.*

L1 SOP PARKING....RESUME

GROUND OPERATIONS IN COLD WEATHER CONDITIONS

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-A-00020553.0001001 / 17 NOV 20

GENERAL

For ground operations on contaminated runways, *Refer to EFB-TOF-30-30 Descriptions* and *Refer to PRO-NOR-SUP-ADVWXR General*.
The following procedures supplement the normal operating procedures.

L2 *Note: At low outside air temperatures, avoid keeping the doors unnecessarily open, since this causes temperature regulation problems in the cockpit and in cabin areas near the doors.*

Ident.: PRO-NOR-SUP-ADVWXR-A-00020555.0001001 / 20 MAR 17

SAFETY EXTERIOR INSPECTION

PROTECTIVE COVERS....REMOVED
APU INTAKE....CHECK FREE OF SNOW AND ICE

PACKS INLET/OUTLET DOORS....................CHECK FREE OF SNOW AND ICE
OUTFLOW VALVES....................CHECK FREE OF SNOW AND ICE
PRESSURE RELIEF VALVES....................CHECK FREE OF SNOW AND ICE
ABOVE ITEMS....................DEICE IF NECESSARY

Ident.: PRO-NOR-SUP-ADVWXR-A-00020554.0001001 / 20 MAR 17

PRELIMINARY COCKPIT PREPARATION

PRELIMINARY COCKPIT PREPARATION - SOP....................COMPLETED

L2 APU is started and the air conditioning is on.

Note: *1. Ground power should be used to start the APU if the OAT is -15 °C (5 °F) or below.*
2. With cockpit temperatures below -15 °C (5 °F), the display units may not be available.

L1 ● **If the avionics bay is cold soaked:**

L2 The aircraft was parked without electrical ground supply or without air conditioning.

L1 IRS....................INITIATE ALIGNMENT

L2 For temperatures at or below -15 °C (5 °F) in the avionics bay, the IRS alignment requires 15 min.

L1 WINDSHIELD AND UPPER COCKPIT FUSELAGE....................ICE/SNOW REMOVED

CAUTION	With ice or snow accumulated on the windshield and/or the upper cockpit fuselage, and if the PROBE/WINDOW HEAT is on, melted ice or snow running down from these areas could re-freeze on the fuselage area below, if the temperature is very low. This could create ice build-up on the forward fuselage that could possibly disturb the airflow around the static/pitot/angle-of-attack probes.

PROBE COVERS....................CHECK REMOVED

L2 Ensure that the probe covers are removed in order to prevent them from melting.

L1 PROBE/WINDOW HEAT....................ON

Ident.: PRO-NOR-SUP-ADVWXR-A-00020601.0001001 / 05 JUN 18

EXTERIOR WALKAROUND

SURFACES....................CHECK FREE OF FROST, ICE AND SNOW

L2 *Check critical surfaces: leading edges, upper wing surfaces, vertical and horizontal stabilizers, all control surfaces, slats and flaps.*

Note: *Thin hoarfrost is acceptable on the upper surface of the fuselage. Refer to LIM-ICE_RAIN Definition of Thin Hoarfrost.*

On the underside of the wing tank areas, a maximum layer of 3 mm (1/8 in.) of frost is acceptable.

L1 LANDING GEAR........................CHECK FREE OF FROST, ICE AND SNOW

L2 *Check gear assemblies, lever locks, tires and doors*

L1 ENGINES........................CHECK FREE OF FROST, ICE AND SNOW

L2 *Check inlets, inlet lips, fans, spinners, fan exhaust ducts, reversers assemblies.*

L1 ENGINE FANS........................CHECK FREE ROTATION

L2 *Check that engine fans are not stuck and can rotate freely.*

L1 DRAINS, BLEEDS, PROBES........................CHECK FREE OF FROST, ICE AND SNOW

L2 *Probes: pitot tubes, static ports, TAT sensors and AOA sensors.*

L1 FUEL TANK VENTS........................CHECK FREE OF FROST, ICE AND SNOW
RADOME........................CHECK FREE OF FROST, ICE AND SNOW
Lower part of the NOSE FUSELAGE........................CHECK FREE OF FROST, ICE AND SNOW
WATER SUPPLIES........................CHECK NOT FROZEN AND REFILLED

L2 *Commercial water supplies should have been previously emptied prior to aircraft cold soak.*

Ident.: PRO-NOR-SUP-ADVWXR-A-00020556.0001001 / 20 MAR 17

AFTER START

- **After first engine start:**
  PROBE/WINDOW HEAT........................AUTO

L2 Heating will continue to operate automatically.

L1 NORMAL PROCEDURE........................RESUME

MINIMUM SPEED WITH ICE ACCRETION

Ident.: PRO-NOR-SUP-ADVWXR-00020558.0002001 / 20 MAR 17
Applicable to: ALL

Evidence of ice accretion can be ice on the visual indicator (between the two cockpit windshields) or on the windshield wipers.

CAUTION	Extended flight in icing conditions with the slats extended should be avoided.

- **If wing anti-ice is operative:**
  - **In CONF clean:**

    MIN SPEED: VLS + 15 kt

- ■ **In CONF 1, 2, 3 or FULL:**

  MIN SPEED: VLS + 5 kt

The minimum speed takes into account ice accretion on non-heated structure.

- ● **If wing anti-ice is not operative:**

  MIN SPEED: VLS + 10 kt/GREEN DOT

The minimum speed takes into account ice accretion on the entire airframe when anti-ice is inoperative.

OPERATIONS ON CONTAMINATED AIRPORTS

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-B-00020561.0001001 / 20 MAR 17

GENERAL

If the ground surfaces are not contaminated but the weather corresponds to icing conditions with falling rain, slush or snow, anticipate a probable resulting runway/surfaces contamination.
There is a low probability of fluid ingestion by the engine which should anyway not degrade the safety. The risk of ingestion is independent of the depth of the contaminant.

Ident.: PRO-NOR-SUP-ADVWXR-B-00020562.0001001 / 04 MAY 23

UNDUE ALERTS

On the ground with contaminated surfaces or deicing fluid on radio altimeter antennas, the radio altimeters may indicate some erroneous values or no values.
If the PFD displays erroneous radio altimeter values, the flight crew can disregard the triggered auto callouts and/or the GPWS/EGPWS alerts.

Note: *Undue GPWS/EGPWS alerts may trigger at the apron, during taxi, takeoff and landing runs.*

If the PFD does not display any radio altimeter values on both sides, the flight crew can disregard the NAV RA 1(2) FAULT or NAV RA 1+2 FAULTalerts.

The PFD recovers the radio altimeter indication in the following cases:
- The aircraft is on a non-contaminated surface, or
- The radio altimeter antennas are no longer covered by any fluids (de-icing fluid or water).

The flight crew must check that the radio altimeter values are indicated on the PFD before entering the runway.

Ident.: PRO-NOR-SUP-ADVWXR-B-00020563.0001001 / 20 MAR 17

PARKING

- **After engine shutdown and before shutting down electrical supply:**

  FLAPS/SLATS.......................................CONFIRM FREE OF CONTAMINATION

  L2 Perform a visual inspection to determine if the flaps/slats mechanism is free of contamination. If necessary, perform decontamination.

  L1 YELLOW ELEC PUMP pb.......................................AUTO
  GREEN ELEC PUMP pb.......................................AUTO
  YELLOW ELEC PUMP pb (guarded).......................................ON
  GREEN ELEC PUMP pb (guarded).......................................ON
  SLATS/FLAPS.......................................RETRACT

  L2 *Monitor slats/flaps retraction on ECAM upper display.*

  L1
  - **When slats and flaps are retracted:**

    YELLOW ELEC PUMP pb (guarded).......................................AUTO
    GREEN ELEC PUMP pb (guarded).......................................AUTO

  NORMAL PROCEDURE.......................................RESUME

OPERATIONS WITH VOLCANIC ASH, SAND OR DUST

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-C-00020564.0001001 / 20 MAR 17

PRELIMINARY COCKPIT PREPARATION

APU.......................................AVOID USE

L2 *Request ground power for air conditioning and electricity. If ground power is not available, the APU should be used only to start the engines.*

L1 WINDSHIELD WIPERS.......................................DO NOT USE

L2 *Do not use the windshield wipers to remove ash, sand or dust.*

L1
- **For takeoff performance:**

  BRAKING PERFORMANCE MAY BE DEGRADED

  L2 *A layer of volcanic ash, sand or dust on the runway may degrade the braking efficiency.*

Ident.: PRO-NOR-SUP-ADVWXR-C-00020565.0001001 / 20 MAR 17

EXTERIOR WALKAROUND

SURFACES AND EQUIPMENT..CHECK FREE OF DEPOSITS

L2 *Ground maintenance should remove ash, sand or dust that has settled on exposed lubricated surfaces and could penetrate seals or enter the engine gas path, air conditioning system, air data probes, access doors and panels and other orifices on the aircraft.*

L1 ENGINE/APU INLETS.. CHECK FREE OF DEPOSITS

L2 *Inspect the inlets and order them cleaned of deposit. Have the area within 8 m (25 ft) of the engine inlet cleaned of volcanic ash, as much as practical.*

Ident.: PRO-NOR-SUP-ADVWXR-C-00020566.0001001 / 10 NOV 20

ENGINE START

ALL ENGINES..CRANK

L2 *Before engine start, ventilate all engines for 2 min by dry-cranking at the maximum motoring speed to remove any deposit from the booster area. Refer to PRO-NOR-SUP-ENG Engine Ventilation (Dry Cranking).*

L1
- **If air start unit is available:**
  ENGINE START WITH AN AIR START UNIT...
  Refer to PRO-NOR-SUP-ENG Engine Start with an Air Start Unit
- **If air start unit is not available:**
  SOP - ENGINE START...PERFORM

Ident.: PRO-NOR-SUP-ADVWXR-C-00020567.0003001 / 28 MAY 20

TAXI

ONE ENGINE TAXI...DO NOT PERFORM

L2 *Minimize the thrust during taxi.*

L1 ENG 1 BLEED...OFF
ENG 2 BLEED...OFF

L2 *Keep engine bleed valves closed for taxiing, especially in volcanic ash.*

L1 *Note: The AIR ENG 1+2 BLEED FAULT alert triggers when both ENG BLEED pb-sw are set to OFF. When this occurs, disregard this alert.*

FOR 180 ° TURN ON RUNWAY: INITIATE THE TURN DOWNWIND

L2 *In order to prevent ash, sand or dust ingestion.*

Ident.: PRO-NOR-SUP-ADVWXR-C-00020568.0001001 / 20 MAR 17

TAKEOFF

ASH, SAND OR DUST.. ALLOW TO SETTLE

L2 *Allow ash, sand or dust (If present) to settle on runway before starting the takeoff roll.*

L1 PACK OFF TAKEOFF.. CONSIDER

L2 *This will prevent air conditioning system contamination.*

L1 ROLLING TAKEOFF...CONSIDER

Ident.: PRO-NOR-SUP-ADVWXR-C-00020569.0001001 / 20 MAR 17

AFTER TAKEOFF

MINIMIZE TIME IN SAND OR DUST CLOUD

L2 *Climb to quickly exit the sand/dust cloud. If possible, altitude constraints may be disregarded in coordination with ATC.*

L1 ALL ENG BLEED... ON

Ident.: PRO-NOR-SUP-ADVWXR-C-00020570.0001001 / 20 MAR 17

IN FLIGHT

AVOID ASH, SAND OR DUST CLOUD

- **If sand or dust cloud encounter:**

  MINIMIZE TIME IN SAND OR DUST CLOUD

  L2 *If possible and in coordination with ATC, adapt flight path (route and altitude) to exit the cloud.*

L1
- **If ash cloud encounter:**

  VOLCANIC ASH ENCOUNTER PROCEDURE.. APPLY

Ident.: PRO-NOR-SUP-ADVWXR-C-00020571.0001001 / 20 MAR 17

DESCENT PREPARATION

SOP – DESCENT PREPARATION.. PERFORM

AUTOLAND RECOMMENDED

L2 *Deposits on the windshield may significantly reduce visibility during approach and landing. Consider a diversion to an airport where autoland is possible.*

L1
- **For landing performance:**

  CONSIDER IDLE REVERSE

  BRAKING PERFORMANCE MAY BE DEGRADED

  L2 *A layer of volcanic ash, sand or dust on the runway may degrade the braking efficiency.*

Ident.: PRO-NOR-SUP-ADVWXR-C-00020572.0001001 / 20 MAR 17

DESCENT

AVOID LEVEL FLIGHT IN ASH, SAND OR DUST CLOUD

L2 *If possible and in coordination with ATC, perform holding patterns and last level off before final descent outside of the cloud.*

Ident.: PRO-NOR-SUP-ADVWXR-C-00020573.0005001 / 28 MAY 20

LANDING

- **Before landing:**

ENG 1 BLEED.. OFF
ENG 2 BLEED.. OFF

Note: The AIR ENG 1+2 BLEED FAULT alert triggers when both ENG BLEED pb-sw are set to OFF. When this occurs, disregard this alert.

PACKS 1 and 2..AS RQRD

L2 *Consider to set the packs OFF in order to avoid contamination of the air conditioning system.*

L1
- **During landing:**

REVERSERS..AS RQRD

L2 *If it appears that maximum reverse thrust is needed, apply reverse thrust when the main landing gear touches down. Limit the use of reverse thrust as much as possible, because reverse flow may throw up ash, sand or dust and impair visibility.*

Ident.: PRO-NOR-SUP-ADVWXR-C-00020574.0001001 / 20 MAR 17

AFTER LANDING

ONE ENGINE TAXI..DO NOT PERFORM

L2 *Minimize thrust during taxi.*

L1 APU.. AVOID USE

FOR 180 ° TURN ON RUNWAY: INITIATE THE TURN DOWNWIND

Ident.: PRO-NOR-SUP-ADVWXR-C-00020575.0001001 / 20 MAR 17

SECURING THE AIRCRAFT

If the aircraft is parked at an airport contaminated with volcanic ash, sand or dust, install engine inlet covers and other protective covers and plugs.
In addition:

- **After switching off all bleeds and before switching OFF AC power:**

  DITCHING pb....................ON

L2 *This closes the outflow valve, pack valves and avionic ventilation inlet and extract valves.*

L1
- **After switching OFF the batteries:**

  DITCHING pb....................OFF

L2 *All the applicable valves will open at the next power-up.*

L1 PROTECTIVE COVERS....................INSTALL

L2 *Install protective covers/plugs to protect the aircraft/engines from volcanic ash, sand or dust.*

L1 LOGBOOK.................... REPORT ASH, SAND OR DUST CLOUD ENCOUNTER

SECURING THE AIRCRAFT FOR COLD SOAK

Ident.: PRO-NOR-SUP-ADVWXR-00020599.0001001 / 28 MAY 20
Applicable to: ALL

Cold soak should be considered in the following conditions:
- The OAT is less than 0 °C (32 °F), and
- No electrical supply and no air conditioning are provided to the aircraft, and
- The temperatures of aircraft components decrease below 0 °C (32 °F).

WHEN SECURING THE AIRCRAFT

Note: *At the beginning of a cold soak, due to a transient temperature difference between fluid in the reservoir and the system piping, the HYD G RSVR UNDERFILLED alert may be triggered in the ECAM. Check that the reservoir quantity is in the upper half part of the normal filling range. The alert may disappear with the operation of the green electrical pump.*

- **After switching off all bleeds and before switching off the electrical AC power:**

  DITCHING pb .... ON

L2 *This closes the outflow valve, pack valves and avionic ventilation inlet and extract valves.*

L1
- **When the chocks are in place:**

  PARKING BRAKE....................OFF

L2 *Releasing the parking brake prevents the brakes from freezing.*

L1
- **After switching off the electrical AC power and the batteries:**

  DITCHING pb ....OFF

L2 *All the applicable valves will open at the next power-up.*

L1 CAPT SEAT..MOST FORWARD POSITION

L2 *To ease access to the avionics bay, since seat operation becomes difficult once the mechanism is cold-soaked.*

L1 PROTECTIVE COVERS..INSTALL

L2 *Request ground crew to install protective covers and plugs, in order to protect the aircraft's wheels, engines and probes from snow and ice.*

L1 WATER SYSTEM DRAINING...REQUEST

L2 *Request maintenance actions to drain the water system for cold soak prevention purposes.*
Refer to PRO-NOR-SUP-ADVWXR Water System Depressurization or Draining - General.

L1 ● **If no ground supply or air conditioning is available:**
APU BATTERY...REMOVE

L2 *If the APU battery is subject to a cold soak for 12 h or more and the ambient temperature is below -15 °C (5 °F), its remaining capacity may not allow the cold-soaked APU to start. Remove the battery and store it in a warm place.*

WATER SYSTEM DEPRESSURIZATION OR DRAINING

Applicable to: ALL

Ident.: PRO-NOR-SUP-ADVWXR-Z-00002036.0001001 / 21 MAR 17

GENERAL

Drain the water system, if the OAT requires it, as shown below :

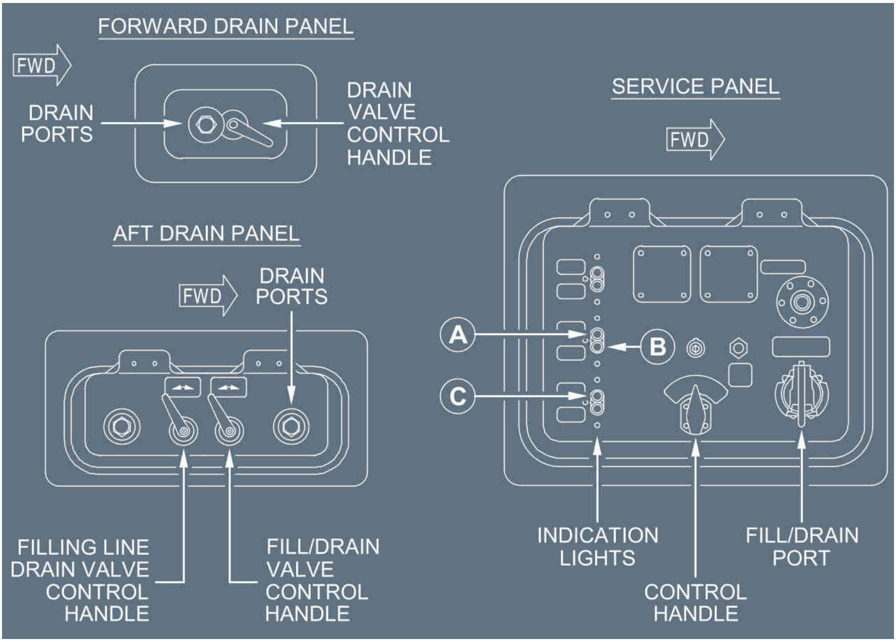
Configuration			Exposure time	Water tank drain
Air Conditioning	**Cabin temperature**	**Outside Air Temperature**		
ON	Above 10 °C (50 °F)	Between 0 and -15 °C (32 and 5 °F)	Any	Not required
		Below -15 °C (5 °F)	1 h 15 min	Required
OFF		Between 0 and -7 °C (32 and 19.4 °F)	1 h 30 min	
		Between -7 and -15 °C (19.4 and 5 °F)	0 h 30 min	
		Below -15 °C (5 °F)	Any	

Ident.: PRO-NOR-SUP-ADVWXR-Z-00002037.0002001 / 21 MAR 17

WATER DRAINING PROCEDURE

The following procedure must be applied, when the water system needs to be drained, and when the aircraft is exposed to temperatures below the freezing point.
Draining is usually carried out with the electrical power supply on.

POTABLE-WATER PANELS


FORWARD DRAIN PANEL
FWD
DRAIN PORTS
DRAIN VALVE CONTROL HANDLE
SERVICE PANEL
FWD
AFT DRAIN PANEL
FWD
DRAIN PORTS
A
B
C
FILLING LINE DRAIN VALVE CONTROL HANDLE
FILL/DRAIN VALVE CONTROL HANDLE
INDICATION LIGHTS
CONTROL HANDLE
FILL/DRAIN PORT

ACCESS PLATFORM(S)....PUT IN POSITION
SHUT-OFF VALVES IN GALLEYS/TOILETS....CHECK OPEN
WATER FAUCETS IN GALLEYS/TOILETS....CHECK MIDDLE (WARM) POSITION
FWD AND AFT DRAIN, SERVICE PANELS' ACCESS DOORS....OPEN
DRAIN PORT CAPS....REMOVE

Remove the drain port cap of the potable water service panel.

DRAIN HOSES....CONNECT

Connect drain hoses to the drain port on the :

- *Forward and aft drain panels*
- *Potable water service panel*

CONTROL HANDLE (SERVICE PANEL)....TURN TO “DRAIN” AND PULL

To drain, turn the handle to the “DRAIN” position, and then pull it out until it reaches its mechanical stop. The (A), (B), (C) indicator lights come on. Water flows out of the drain ports of the forward and aft drain, and the potable water service panels.

- **If the aircraft's electrical network is de-energized :**
  DRAIN CONTROL HANDLES (FWD and AFT DRAIN PANELS).................. TURN TO "OPEN"
  The most aft (filling line drain valve control) handle on the aft drain panel is set to the "OPEN" position. It is no longer possible to close the aft and forward drain panel access doors.

- **When the system is drained :**
  CONTROL HANDLE (SERVICE PANEL).............................PUSH AND TURN TO "NORMAL"
  The (A), (B), (C) indicator lights go off.
  - **If the aircraft's electrical network is de-energized :**
    DRAIN CONTROL HANDLES (FWD and AFT DRAIN PANELS).. ....TURN TO "SHUT"

Note: *In freezing temperatures, all drain valves must remain open after draining to prevent damage to the system.*

DRAIN HOSES...DISCONNECT
PANELS...CLEAN AND DRY

Note: *In freezing conditions, when the drain valves must stay open, do not put the caps on the service panel drain port..*

ACCESS DOORS (FWD, AFT)..CLOSE
Water drainage is assured even with access doors closed.

Note: *When the drain valve is open manually it is not possible to close the potable water service panel access door.*

ACCESS PLATFORM(S)...REMOVE

Intentionally left blank

MANUAL ENGINE START

Ident.: PRO-NOR-SUP-ENG-A-00004969.0001001 / 21 MAR 17
Applicable to: ALL

GENERAL

Pilots normally use automatic starting to start an engine.

However, manual starting is recommended in the following cases :
- **After aborting a start, because of** :
  - Engine stall
  - Engine EGT overlimit
  - Low start air pressure
- **When expecting a start abort, because of** :
  - Degraded bleed performance, due to hot conditions, or at a high-altitude airfields.
  - An engine with a reduced EGT margin in hot conditions, or at a high-altitude airfields.
  - Marginal performance of the external pneumatic power group.

Ident.: PRO-NOR-SUP-ENG-A-00020888.0006001 / 19 DEC 17
Applicable to: LV-KHT, LV-KHU

MANUAL ENGINE START PROCEDURE

Note: *A residual EGT in excess of 100 °C may result in an EGT limit exceedance during manual start. The engine should be motored to reduce residual EGT below 100 °C.*

Note: *During a manual engine start, if the flight crew suspects an engine start malfunction, or if an engine-related ECAM alert is triggered, the PF must abort the start sequence as follows:*
- *Before the ENG MASTER lever is set to ON, the PF must set the ENG MAN START pb-sw to OFF*
- *After the ENG MASTER lever is set to ON, the PF must set the ENG MAN START pb-sw to OFF, and then the ENG MASTER lever to OFF.*
  In that case, the flight crew should consider a dry crank cycle of the affected engine before they perform another start attempt (Refer to PRO-NOR-SUP-ENG Engine Ventilation (Dry Cranking)).

Then, in the case of an ECAM alert, the PF must announce "ECAM actions", in accordance with the ECAM management philosophy.

THR LEVERS...IDLE

CAUTION	The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, the thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.

ENG START sel...NORM THEN IGN/START

The lower ECAM displays the engine page.

Note: *If both engines are started manually, the following procedure applies one engine at a time.*

- **When all engines parameters are available on the upper ECAM display (no amber crosses displayed):**
  ENG MAN START pb-sw...ON
  START VALVE...CHECK IN-LINE
  N3 INCREASE...CHECK
  OIL PRESS INCREASE...CHECK
- **When N3 reaches the maximum motoring speed (25 % minimum):**

  Note: *The maximum motoring speed is reached when there is no significant N3 increase.*

  ENG MASTER...ON
  CHRONO...START
  L2 *The PM starts the timing in order to monitor the light-up duration.*
  L1 IGNITERS A AND B...CHECK ON
  FUEL FLOW INCREASE...CHECK
- **30 s maximum after fuel flow increase:**
  EGT INCREASE...CHECK
  N1 INCREASE...CHECK
- **When N3 at or above 50 %:**
  START VALVE...CHECK CROSS LINE
  IGNITERS A AND B...CHECK OFF
- **When idle is reached (AVAIL indication is displayed):**
  MAIN ENG PARAMETERS...CHECK NORMAL
  SECONDARY ENG PARAMETERS...CHECK NORMAL
  ENG MAN START pb-sw...OFF
  ENG START sel...NORM
  SOP - ENGINE START...RESUME

Ident.: PRO-NOR-SUP-ENG-A-00020888.0004001 / 19 DEC 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

MANUAL ENGINE START PROCEDURE

Note: *During a manual engine start, if the flight crew suspects an engine start malfunction, or if an engine-related ECAM alert is triggered, the PF must abort the start sequence as follows:*

- *Before the ENG MASTER lever is set to ON, the PF must set the ENG MAN START pb-sw to OFF*
- *After the ENG MASTER lever is set to ON, the PF must set the ENG MASTER lever to OFF, and then the ENG MAN START pb-sw to OFF.*
  In that case, the flight crew should consider a dry crank cycle of the affected engine before they perform another start attempt (Refer to PRO-NOR-SUP-ENG Engine Ventilation (Dry Cranking)).

Then, in the case of an ECAM alert, the PF must announce "ECAM actions", in accordance with the ECAM management philosophy.

THR LEVERS....................IDLE

CAUTION	The engines start regardless of the thrust lever position. If the thrust levers are not set to IDLE, the thrust rapidly increases to the corresponding thrust lever position, causing a hazardous situation.

ENG START sel....................NORM THEN IGN/START

The lower ECAM displays the engine page.

Note: *If both engines are started manually, the following procedure applies one engine at a time.*

- **When all engines parameters are available on the upper ECAM display (no amber crosses displayed):**

  ENG MAN START pb-sw....................ON
  START VALVE....................CHECK IN-LINE
  N2 INCREASE....................CHECK
  OIL PRESS INCREASE....................CHECK

- **When N2 reaches the maximum motoring speed (15 % minimum):**

  Note: *The maximum motoring speed is defined as the speed at which N2 acceleration is less than 1 % in approximately 5 s.*

  ENG MASTER....................ON
  CHRONO....................START

L2 *The PM starts the timing in order to monitor the light-up duration.*

L1 IGNITERS A AND B..CHECK ON
FUEL FLOW INCREASE..CHECK

- **20 s maximum after fuel flow increase:**

EGT INCREASE..CHECK
N1 INCREASE..CHECK

- **When N2 reaches 50 %:**

START VALVE (is fully closed after 3 to 4 s)..................CHECK CROSS LINE
IGNITERS A AND B (at or above 54 % N2)..................CHECK OFF
MAIN ENG PARAMETERS..................CHECK NORMAL
SECONDARY ENG PARAMETERS..................CHECK NORMAL

- **When idle is reached (AVAIL indication is displayed):**

ENG MAN START pb-sw..OFF
ENG START sel..NORM
SOP - ENGINE START..RESUME

ENGINE START WITH AN AIR START UNIT

Ident.: PRO-NOR-SUP-ENG-00020889.0001001 / 04 NOV 20
Applicable to: ALL

- **Before connecting the air start unit:**

PACK 1..OFF
PACK 2..OFF

L2 *Packs are selected off to prevent any possible contamination of the packs by the air start unit.*

L1 APU BLEED..OFF
ENG 1 BLEED..OFF
ENG 2 BLEED..OFF
X BLEED..OPEN

AIR START UNIT CONNECTION..REQUEST

L2 *Two ground air start units may be used in parallel, if the pressure/flow relation is expected to be marginal.*

L1
- **When cleared to start:**

Note: The AIR ABNORM BLEED CONFIG alert is triggered after the first engine start. It can be disregarded.

ENG 1..START

Note: - *For any operational reason, engine 2 can be started first.*
In this case, check the brake ACCU pressure prior to engine start.
- *The minimum recommended starter air supply pressure is 25 PSI when the start valve is open.*

- **After engine 1 is started:**
  - **If the air start unit is used to start engine 2:**

    ENG 2.. START
    - **When engine 2 is started:**

      AIR START UNIT DISCONNECTION.............................. REQUEST
      X BLEED.. AUTO
      ENG 1 BLEED... ON
      ENG 2 BLEED... ON
      PACK 1.. ON
      PACK 2.. ON
  - **If the crossbleed engine start procedure is used to start engine 2:**

    AIR START UNIT DISCONNECTION................................ REQUEST
    ENG 1 BLEED... ON
    PACK 1.. ON
    PACK 2.. ON
    CROSSBLEED ENGINE START PROC.................................. APPLY
    Refer to PRO-NOR-SUP-ENG Crossbleed Engine Start.

WARNING	Disconnection of the external power with the EXT PWR pb-sw set to ON may cause injury to the ground engineer. Request disconnection of the external power only with the EXT PWR pb-sw set to AVAIL.

EXT PWR... CHECK AVAIL
EXT PWR DISCONNECTION.. REQUEST

Note: *The external electrical power can be removed after the first engine start. However, be aware that electrical transients may occur in this case. Refer to PRO-NOR-SUP-ENG Engine Start with External Electrical Power.*

SOP - AFTER START... RESUME

CROSSBLEED ENGINE START

Ident.: PRO-NOR-SUP-ENG-00020890.0001001 / 17 MAR 17
Applicable to: ALL

CAUTION	Do not perform the crossbleed engine start procedure during pushback. Simultaneous use of engine bleed supply and external pneumatic power supply is prohibited.

One engine must be running in order to supply air for other engine start.

- **Before second engine start :**

APU BLEED...OFF

L2 *The BLEED valve of the supplying engine reopens and the cross bleed valve closes.*

L1 ENG BLEED (supplying engine)..............................ON
ENG BLEED (receiving engines)..............................OFF

L2 *The bleed valves of receiving engines are closed to avoid reverse flow leakage.*

L1 X BLEED...OPEN

- **When cleared to start :**

AREA CLEAR OF OBSTACLES..............................CONFIRM

L2 Ensure increased power jet wake does not constitute any hazard to people or installations behind the aircraft.

L1 THR LEVER (supplying engine)..................ADJUST FOR BLEED PRESSURE

Adjust thrust of supplying engine to obtain an engine bleed pressure of 30 PSI.
If the thrust required to obtain the appropriate engine bleed pressure exceeds 40 % N1, pay particular attention to the surrounding area.

RECEIVING ENGINE.......................................START

Apply the normal engine start procedure.

- **After start :**

THR LEVER (supplying engine)..............................IDLE
X BLEED...AUTO
ENG BLEED (receiving engine)..............................ON
PACK 1...ON
PACK 2...ON

ENGINE START WITH EXTERNAL ELECTRICAL POWER

Ident.: PRO-NOR-SUP-ENG-00020891.0001001 / 12 JUL 18
Applicable to: ALL

In order to ensure that the entire network remains electrically supplied, it is recommended to start both engines before the disconnection of the external electrical power.

EXT PWR..CHECK AVAIL

WARNING	Disconnection of the external power with the EXT PWR pb-sw ON may cause injury to the ground engineer. Request disconnection of the external power only with the EXT PWR pb-sw AVAIL.

EXT PWR DISCONNECTION..REQUEST

- **When the external power supply is disconnected:**
  - **If only one engine is running:**

    A power transient occurs when the external electrical power is disconnected, as the No Break Power Transfer (NBPT) function is not available.
  - **If both engines are running:**

    No power transient occurs, as the NBPT is available.

ENGINE START ON BATTERIES

Ident.: PRO-NOR-SUP-ENG-00020892.0004001 / 19 MAY 21
Applicable to: LV-KHT, LV-KHU

This procedure can be applied when the aircraft electrical network is only supplied by the batteries (no APU generator or external electrical power unit available).

AIR START UNIT CONNECTION..REQUEST

L2 *Two ground air start units may be used in parallel, if the pressure/flow relation is expected to be marginal.*

L1 ENG 1..PERFORM MANUAL START

Refer to PRO-NOR-SUP-ENG Manual Engine Start - Procedure.

The secondary engine parameters are not available as long as electrical power is provided by the batteries.

Engine 1 must be started first as:
- The X BLEED valve does not open automatically on batteries
- The parking brake is pressurized by engine 1.

After engine start, the EEC remains in degraded N1 mode for 4 min and the engine must not exceed idle power during this time period. Follow the ECAM procedure to recover the normal EPR mode.

- **When all parameters are stable:**
  ELECTRICAL NETWORK NORMAL OPERATION.....CHECK
  ENG 2.....PERFORM AUTOMATIC START

ENGINE START ON BATTERIES

Ident.: PRO-NOR-SUP-ENG-00020892.0002001 / 19 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

This procedure can be applied when the aircraft electrical network is only supplied by the batteries (no APU generator or external electrical power unit available).

AIR START UNIT CONNECTION.....REQUEST

L2 *Two ground air start units may be used in parallel, if the pressure/flow relation is expected to be marginal.*

L1 ENG 1.....PERFORM AUTOMATIC START

The secondary engine parameters are not available as long as electrical power is provided by the batteries.

Engine 1 must be started first as:
- The X BLEED valve does not open automatically on batteries
- The parking brake is pressurized by engine 1.

- **When all parameters are stable:**
  ELECTRICAL NETWORK NORMAL OPERATION.....CHECK
  ENG 2.....PERFORM AUTOMATIC START

ENGINE START VALVE MANUAL OPERATION

Ident.: PRO-NOR-SUP-ENG-00020893.0003001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

BEFORE ENGINE START

Advise ground crew to prepare for manual engine start valve operation.

WARNING	To ensure safety of the ground crew when starting an engine with manual operation of the start valve, the flight crew should start the affected engine first.

ENGINE START

AUDIO CONTROL PANEL.....CAB
GROUND CREW CLEARANCE.....OBTAIN

- **When the ground crew is ready:**
  “ENGINE 1(2) START”........ ANNOUNCE
  ENG START sel........ IGN/START
  ENG MASTER........ ON
  “OPEN START VALVE AND KEEP OPEN”........ ORDER
  If not maintained in the OPEN position by the ground crew, the start valve closes.
- **When N3 at 50 %:**
  “CLOSE START VALVE”........ ORDER
  SOP – ENGINE START........ RESUME

ENGINE START VALVE MANUAL OPERATION

Ident.: PRO-NOR-SUP-ENG-00020893.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

BEFORE ENGINE START

Advise ground crew to prepare for manual engine start valve operation.

WARNING	To ensure safety of the ground crew when starting an engine with manual operation of the start valve, the flight crew should start the affected engine first.

ENGINE START

AUDIO CONTROL PANEL........ CAB
GROUND CREW CLEARANCE........ OBTAIN

- **When the ground crew is ready:**
  “ENGINE 1(2) START”........ ANNOUNCE
  ENG START sel........ IGN/START
  ENG MASTER........ ON
  “OPEN START VALVE AND KEEP OPEN”........ ORDER
  If not maintained in the OPEN position by the ground crew, the start valve closes.
- **When N2 at 50 %:**
  “CLOSE START VALVE”........ ORDER
  SOP – ENGINE START........ RESUME

ENGINE VENTILATION (DRY CRANKING)

Ident.: PRO-NOR-SUP-ENG-00020894.0001001 / 17 MAR 17
Applicable to: ALL

On ground, after:
- An unsuccessful manual engine start, or
- An unsuccessful automatic start not followed by an automatic dry crank,

the flight crew can perform a dry crank cycle on the affected engine to remove the fuel vapors.

- **Before dry crank:**
  ENG MASTER (affected engine)........CHECK OFF
  ENG START sel........CHECK NORM
  ENG MAN START pb-sw (affected engine)........CHECK OFF

- **Dry crank**
  ENG START sel........CRANK
  ENG MAN START pb-sw (affected engine)........ON

Note: *To clear fuel vapors, a 30 seconds dry crank cycle is the minimum required.*

L2 Note: *A manual start sequence can be initiated following a dry crank cycle (Refer to PRO-NOR-SUP-ENG Manual Engine Start - Procedure). The flight crew should consider the starter limitations (Refer to LIM-ENG Starter).*

L1
- **When the dry crank is completed:**
  ENG MAN START pb-sw (affected engine)........OFF
  ENG START sel........NORM

ONE ENGINE TAXI

Applicable to: ALL

Ident.: PRO-NOR-SUP-ENG-B-00020525.0002001 / 03 NOV 21

GENERAL

The flight crew should be aware of the following:
- One-engine taxi reduces the aircraft systems redundancy. Therefore, the flight crew should decide to apply one-engine taxi procedures in accordance with the Operator's guidelines and the flight conditions of the day, including the aircraft status.
- One-engine taxi may require more thrust than normal. Therefore, the flight crew must be careful in order to avoid excessive jet blast and the risk of FOD.
- One-engine taxi creates fuel imbalance. Therefore, the flight crew should pay particular attention to the fuel imbalance limitation for the next takeoff.

- Taxi with engine 1 is recommended in order to pressurize the blue hydraulic system to ensure brake accumulator pressure.

  Note: *If taxi is performed with engine 2, the flight crew must check that the brake accumulator pressure on the BRAKES and ACCU PRESS indicator is normal.*

- Some operational conditions may prevent, or make more difficult one-engine taxi. The following are examples of some of these conditions:
  - Positive slope (i.e. uphill)
  - Slippery taxiway
  - High aircraft gross weight (slow or short-radius turns in the direction of the operating engine may not be possible at high gross weight).

Ident.: PRO-NOR-SUP-ENG-B-00020526.0002001 / 17 MAY 17

AT DEPARTURE

ENG 1...START

L2 *Engine 1 pressurizes the blue hydraulic system, providing brake accumulator pressure.*

L1 X BLEED...OPEN

L2 *Open the cross bleed valve in order to supply both packs with engine 1.*

L1 APPLY THE “AFTER START” NORMAL PROCEDURE, BUT:

- The APU can be kept running. In that case, switch the APU BLEED to OFF.

  L2 *The APU generator provides power to prevent electrical transients and enable galley and IFE operation. Closing the APU BLEED prevents engine exhaust gases ingestion in the air conditioning system.*

L1
- Delay the ECAM STATUS check and the wing anti-ice setting until all engines are started.

APPLY THE “TAXI” NORMAL PROCEDURE, BUT:

- Delay the flight controls check until all engines are started
- Arm the Autobrake after the flight controls check.

ENGINE WARM-UP TIME BEFORE TAKEOFF (remaining engine)..............................CONSIDER

The second engine must be started soon enough before takeoff, in order to take into account the engine start time and ensure the applicable engine warm-up time (Refer to PRO-NOR-SOP-09 After Start - ENG Start Selector).

● **For ENG 2 start:**

■ **If the APU bleed is available:**

APU BLEED...ON
ENG 2...START
X BLEED...AUTO

■ **If the APU bleed is not available:**

Refer to PRO-NOR-SUP-ENG Crossbleed Engine Start.

APU...AS RQRD

APPLY THE “AFTER START” NORMAL PROCEDURE, INCLUDING:
- ECAM STATUS check
- Selection of the ENG 2 anti-ice and wing anti-ice, as required.

AFTER START CHECKLIST...COMPLETE
FLIGHT CONTROLS...CHECK
AUTO BRK...MAX

Ident.: PRO-NOR-SUP-ENG-B-00020527.0002001 / 17 MAR 17

AT ARRIVAL

APU ....AS RQRD

L2 *If necessary, the APU can be started while taxiing and before shutting down one engine, in order to avoid additional electrical transients and enable galley and IFE operation.*

L1
- **After high thrust operations:**
  ENGINE MINIMUM COOLING TIME...CONSIDER

  Refer to PRO-NOR-SOP-22 Parking - ENG MASTER Levers.
- **When taxiing in a straight line:**

  Note: *During engine shutdown, a slight jerk forward may occur if the brakes are applied while the aircraft is moving.*

  ENG 2...SHUT DOWN
- **At parking:**
  ENG 1...SHUT DOWN

REFUELING

Ident.: PRO-NOR-SUP-FUEL-A-00021262.0034001 / 03 NOV 21
Applicable to: LV-KAN, LV-KAO

WARNING

1. Before initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling, *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling*.
4. Do not refuel in bad weather conditions and electrical storms.

PREPARATION

SAFETY PRECAUTIONS..APPLY

During refueling operations, ensure that:
- *HF transmission (including HF transmission via the HF DATA LINK pb) is not performed*
- *The aircraft is properly bonded to the tanker.*

L2 *The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft*

L1 - *The external lighting is not operated (except for NAV & LOGO).*

In the cockpit, check that the PARK BRK handle is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK handle cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM..IN POSITION

HIGH LEVEL TEST:

● **From refueling control panel:**

HI LEVEL TEST sw ....PRESS

During test, HI LVL light and OVERFLOW light come on if their circuits are serviceable. CKPT light and END light come on. The fuel quantity, PRESELECTED and ACTUAL displays show the number 8 in all digits.
If there is a failure during the high level test the END light flashes and remains flashing after completion. In addition the affected HI LVL light remains on.

● **From cockpit:**

The HIGH LEVEL TEST is performed automatically when cockpit FUEL REFUEL pb is pressed. Positive test will initiate refueling. If the test fails, END light will flash.

- **If HIGH LEVEL TEST is negative:**

  A negative HIGH LEVEL TEST prevents refueling. This situation is latched until FCMC reset.

  FCMC 1 + 2 RESET button (cockpit)....................PULL then PUSH

  Note: *After FCMC reset, re-enter ZFWCG/ZFW in the INIT FUEL PRED page.*

  MANUAL REFUELING PROCEDURE....................APPLY

  Apply manual procedure with continual monitoring of refueling.

  For dispatch, refer to MEL.

Ident.: PRO-NOR-SUP-FUEL-A-00021262.0033001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling*.
4. Do not refuel in bad weather conditions and electrical storms.

PREPARATION

SAFETY PRECAUTIONS....................APPLY

During refueling operations, ensure that:
- *HF transmission (including HF transmission via the HF DATA LINK ◁ pb) is not performed*
- *The aircraft is properly bonded to the tanker*
- *The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft*
- *The external lighting is not operated (except for NAV & LOGO).*

In the cockpit, check that the PARK BRK handle is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK handle cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM....................IN POSITION

HIGH LEVEL TEST:

- **From refueling control panel:**

  HI LEVEL TEST sw .... PRESS

  During test, HI LVL light and OVERFLOW light come on if their circuits are serviceable. CKPT light and END light come on. The fuel quantity, PRESELECTED and ACTUAL displays show the number 8 in all digits.
  If there is a failure during the high level test the END light flashes and remains flashing after completion. In addition the affected HI LVL light remains on.

  - **If HIGH LEVEL TEST is negative:**

    A negative HIGH LEVEL TEST prevents refueling. This situation is latched until FCMC reset.

    FCMC 1+ 2 RESET button (cockpit)... PULL then PUSH

    Note: *After FCMC reset re-enter ZFWCG/ZFW in the INIT FUEL PRED page.*

    MANUAL REFUELING PROCEDURE.. APPLY

    Apply manual procedure with continual monitoring of refueling.

    For dispatch, refer to MEL.

Ident.: PRO-NOR-SUP-FUEL-A-00021262.0015001 / 25 JUL 17
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling*.
4. Do not refuel in bad weather conditions and electrical storms.

PREPARATION

SAFETY PRECAUTIONS.. APPLY

During refueling operations, ensure that:

- *HF transmission (including HF transmission via the HF DATA LINK pb) is not performed*
- *The aircraft is properly bonded to the tanker*
- *The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft*
- *The external lighting is not operated (except for NAV & LOGO).*

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM.......................................IN POSITION

HI LEVEL TEST:

- **From refueling control panel:**

  HI LEVEL TEST sw ....PRESS

  During test, high level lights and over flow lights come on if their circuits are serviceable. CKPT and END lights come on. The fuel quantity, PRESELECTED and ACTUAL displays show all 8's.

  If there is a failure during the high level test the END light flashes and remains flashing after completion. In addition the affected HI LVL light remains on.

  - **If HI LEVEL TEST is negative:**

    A negative HI LEVEL TEST prevents refueling. This situation is latched until FCMC RESET.

    FCMC 1+ 2 RESET button (cockpit).......................................PULL then PUSH

    Note: *After FCMC reset re-enter ZFWCG/ZFW in the MCDU INIT B page.*

    MANUAL REFUELING PROCEDURE.......................................APPLY

    Apply manual procedure with continual monitoring of refueling.

    FOR DISPATCH refer to MEL.

Ident.: PRO-NOR-SUP-FUEL-A-00021256.0013001 / 24 NOV 23
Applicable to: LV-KAN, LV-KAO

AUTOMATIC REFUELING

- **From refueling control panel:**

  [LOAD PRESELECTOR sw] REQUESTED BLOCK FUEL.......................................SET
  REFUEL VALVES selector.......................................CHECK NORM and GUARDED
  MODE SELECT sw.......................................REFUEL

  - **On completion of refueling:**

    END light comes on. It flashes if after refueling an imbalance of more than 3 000 kg (6 614 lb) exists.

    ACTUAL QUANTITY.......................................CHECK
    MODE SELECT sw.......................................OFF and GUARDED

- **From cockpit:**

  BLOCK FUEL on MCDU INIT FUEL PRED page.......................................CONFIRM/SET

  L2 *The CKPT light on the refueling control panel comes on.*

L1 *Note:* *When BLOCK FUEL value has been entered on the MCDU, the aircraft will refuel to the MCDU value. This value has priority and hence cannot be altered from any other refuel panel.*
Refuel to this value can be started from either panel.

FUEL REFUEL pb.. ON

L2 *ON light comes on and a HIGH LEVEL TEST is initiated. If the test is positive, refueling will start. At the refuel couplings, a green light comes on to signal that the aircraft is ready for refueling. This light remains on as long as the REFUEL pb is switched to ON.*

L1
- **On completion of refueling:**

  END light comes on. It flashes if after refueling an imbalance of more than 3 000 kg (6 614 lb) exists or if another abort or abnormal refueling condition occurs.

  FUEL ON BOARD QUANTITY.................................. CHECK
  FUEL REFUEL pb.. OFF

L2 *ON and END lights go off. At the refuel couplings the light goes off to indicate to the ground personnel that hoses can be disconnected.*

Ident.: PRO-NOR-SUP-FUEL-A-00021256.0001001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT, LV-KHU

AUTOMATIC REFUELING

- **From refueling control panel :**

  [LOAD PRESELECTOR sw] REQUESTED BLOCK FUEL.................. SET
  REFUEL VALVES sel.................. CHECK NORM and GUARDED
  MODE SELECT sw.. REFUEL

  - **On completion of refueling :**

    END light comes on. It flashes if after refueling an imbalance greater than 3 000 kg (6 614 lb) exists.

    ACTUAL QUANTITY.. CHECK
    MODE SELECT sw.................................. OFF and GUARDED

Ident.: PRO-NOR-SUP-FUEL-A-00021257.0001001 / 20 MAR 17
Applicable to: ALL

MANUAL REFUELING

DETERMINE FUEL QUANTITY IN EACH TANK

Respect distribution in accordance with applicable REFUEL DISTRIBUTION graph .

Note: *To refuel the trim tank, one of these conditions must be fulfilled.*
- *the two inner tank inlet valves are open.*
- *both inner tank quantities are each greater than 14 000 kg.*
- *one inner tank quantity is greater than 14 000 kg and the other inner tank inlet valve is open.*

REFUEL VALVES sel....................SHUT
REFUEL VALVES sel (tank(s) to be filled)....................OPEN

Note: *Because the Fuel Control and Monitoring System (FCMS) does not have control of all the tanks, the END light will flash.*

MODE SELECT sw....................REFUEL
FUEL QTY....................MONITOR

● **When the tank contents reach the required level :**

Corresponding REFUEL VALVES sel....................SHUT
MODE SELECT sw....................OFF and GUARDED
REFUEL VALVES sel....................NORM and GUARDED

REFUELING WITH ONE ENGINE RUNNING

Ident.: PRO-NOR-SUP-FUEL-00001479.0002001 / 21 MAR 17
Applicable to: ALL

- Refuel with one engine running, only at airports where no external ground pneumatic power is available, and only when APU is unserviceable.
- Only the RH fuel couplings can be used.
- Overwing gravity filling is not permitted.
- Disembark all passengers.
- Obtain airport authorization.
  The Airport Fire Department should standby at the aircraft during the entire refueling procedure.
- Point the aircraft into the wind, at a location where the slope is negligible.
  Set the parking brake and check its pressure.
  Run engine n° 1 at ground idle with its generator connected.
- Do not start engine n° 2, do not shut down engine n° 1, or do not attempt to start the APU before all fueling operations have been completed.
- Position the fuel truck under the extremity of the right wing. Its pressure should not exceed 50 PSI.
- Follow automatic or manual refueling procedure.

Note: *The refuel system must be fully operational.*

OPERATION MONITORING

DURING THE ENTIRE REFUELING PROCEDURE :

- Monitor the fuel truck shut-off valve.
- Be sure that the fueling company is keeping permanent control of the emergency fuel shut off device.
- Have a flight crewmember in the cockpit, to monitor all systems and the running engine.
- Have a qualified ground crewmember at the fueling station, to operate the refuel valve switches.

GROUND FUEL TRANSFER

Ident.: PRO-NOR-SUP-FUEL-00021258.0001001 / 04 SEP 19
Applicable to: ALL

WARNING

1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft.
2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed.
3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling*.
4. Do not operate the fuel pumps with less than 200 kg (440 lb) in the collector cells. If needed, the remaining fuel can be drained by the maintenance team via the water drain valve.

SAFETY PRECAUTIONS...APPLY

During ground operations, ensure that:

- *HF transmission is not performed (including HF transmission via the HF DATA LINK ◁ pb)*
- *If connected:*
  - *The aircraft is properly bonded to the tanker*
  - *The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft*
- *The external lighting is not operated (except for NAV & LOGO).*

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM...IN POSITION

A ground transfer is possible from tank to tank, except to the trim tank.

- **On cockpit overhead FUEL panel :**

PUMPS (of the tanks not to be defueled).. OFF
PUMPS (of the tanks to be defueled).. ON

- **On refueling control panel :**

REFUEL VALVES sel (of tanks not to be filled).. SHUT
REFUEL VALVES sel (of tanks to be filled)..OPEN
MODE SELECT sw ....REFUEL
TRANSF VALVE.. OPEN

Note: *The TRANSF VALVE switch opens the left aft transfer valve only if ENG 1 main pump is on, and opens the right aft transfer valve only if the ENG 2 main pump is on.*

FUEL QTY..MONITOR

- **When the tank contents reach the required level :**
  - **On refueling control panel :**

    Corresponding REFUEL VALVES sel..SHUT
    TRANSF VALVE.. CLOSED and GUARDED
    MODE SELECT sw .... OFF and GUARDED

- **On completion of ground fuel transfer :**

REFUEL VALVES sel.. NORM and GUARDED
Cockpit FUEL panel..SET NORMAL CONFIGURATION

DEFUELING

Applicable to: ALL

Ident.: PRO-NOR-SUP-FUEL-B-00021259.0001001 / 25 JUL 17

WARNING	
WARNING	1. Prior initiation of any ground fuel operations, obey the below fuel safety precautions. This will prevent injury to people and/or damage to the aircraft. 2. Do not request or perform any ground fuel operations if a fire or engine overheat warning is displayed. 3. If the APU fails during any ground fuel operations, do not restart the APU. For APU use during refueling/defueling *Refer to LIM-APU APU Start/Shutdown during Refueling/Defueling*. 4. If only one hose is used for defueling, it must be connected to the coupling marked “USE THIS ADAPTOR TO DEFUEL”. 5. Do not defuel in bad weather conditions and electrical storms.

SAFETY PRECAUTIONS....................APPLY

During defueling operations, ensure that:
- *HF transmission (including HF transmission via the HF DATA LINK pb) is not performed*
- *The aircraft is properly bonded to the tanker*
- *The tanker and the aircraft grounding requirement is based on local regulations. Always connect the ground cable to the parking ground point (or to the tanker) before connecting it to the aircraft*
- *The external lighting is not operated. (except for NAV & LOGO).*

In the cockpit, check that the PARK BRK is ON and that the ACCU PRESS has sufficient pressure. If the PARK BRK cannot be set to ON, check that the chocks are in place.

ACCESS PLATFORM....................IN POSITION

- **Before defueling is started:**
  - **On cockpit overhead FUEL panel:**

    PUMPS (all)....................OFF

Ident.: PRO-NOR-SUP-FUEL-B-00021260.0001001 / 20 MAR 17

DEFUELING BY SUCTION

Note:
- *Defueling all the tanks by suction is possible.*
- *If the trim tank contains fuel, then the fuel system interlocks prevent a suction defuel of the inner tanks.*

- **On refueling control panel:**

  MODE SELECT sw....................DEFUEL
  REFUEL VALVES sel (of the tanks to be defueled)....................OPEN
  FUEL QTY....................MONITOR

  - **When the tank contents reach the required level:**

    REFUEL VALVES sel....................NORM and GUARDED
    MODE SELECT sw....................OFF and GUARDED
    Cockpit FUEL panel....................SET NORMAL CONFIGURATION

Ident.: PRO-NOR-SUP-FUEL-B-00021261.0004001 / 04 SEP 19

DEFUELING WITH FUEL PUMPS

WARNING	Do not operate the fuel pumps with less than 200 kg (440 lb) in the collector cells. If needed, the remaining fuel can be drained by the maintenance team via the water drain valve.

Note: *It is only possible to defuel the inner and center tanks. To defuel the other tanks, their fuel must be first transferred to the inner tank.*

INNER TANKS

- **On refueling control panel:**
  REFUEL VALVES sel....CHECK NORM
  MODE SELECT sw....DEFUEL
  TRANSF VALVE....OPEN

  The LH (RH) aft transfer valves open provided all these conditions are met:
  - *One or more of the LH (RH) main fuel pumps is (are) on.*
  - *The trim tank is empty*
  - *The inner tank and outer tank inlet valves are closed.*

  - **On cockpit overhead FUEL panel:**
    PUMPS L1 and R1 (and L2 and R2 if greater flow needed)....ON
    FUEL QTY....MONITOR

    - **When the tank contents reach the required level:**
      Corresponding PUMPS....OFF

      Note: *When the fuel quantity in an inner tank decreases to 3 500 kg (7 716 lb) the intertank transfer valves automatically open. The fuel in the outer tanks moves to the inner tanks which can be subsequently defueled.*

- **On refueling control panel:**
  TRANSF VALVE....CLOSED and GUARDED
  MODE SELECT sw....OFF and GUARDED
  REFUEL VALVES sel....NORM and GUARDED
  Cockpit FUEL panel....SET NORMAL CONFIGURATION

CENTER TANK

- **On refueling control panel :**
  REFUEL VALVES sel....CHECK NORM
  MODE SELECT sw....DEFUEL

- **On cockpit overhead fuel panel :**
  PUMPS L and R....ON

  - **If trim tank has to be defueled**
    T TANK MODE....FWD
    FUEL QTY....MONITOR

  - **When the tank contents reach the required level :**
    Corresponding PUMPS....OFF

- **On refueling control panel :**
  MODE SELECT sw....OFF and GUARDED

REFUEL VALVES sel.. NORM and GUARDED
Cockpit FUEL panel..SET NORMAL CONFIGURATION

FROST REDUCTION ON THE UPPER WING SURFACES ABOVE THE OUTER TANKS

Ident.: PRO-NOR-SUP-FUEL-00020438.0001001 / 17 MAR 17
Applicable to: ALL

GENERAL

Wing surface temperatures may be significantly below ambient air temperature due to contact with cold fuel. These low wing surface temperatures may result in the accretion of frost on the upper wing surfaces above the outer tanks. Frost accretion may occur not only in cold weather conditions, but also at relatively high OATs, when the level of humidity is high.

CAUTION	Takeoff with frost on the upper wing surface is not permitted due to the detrimental effect on lift. The flight crew must therefore ensure that the upper wing surfaces are clean at the time of departure (*Refer to PRO-NOR-SUP-ADVWXR General*).

The flight crew should apply the following procedure, if:
- Frost accretion on the upper wing surfaces is expected
- Fuel remains in the outer tanks after landing
- Refueling is planned.

AFTER LANDING, DURING TAXI-IN:

OUTR TK XFR.. ON

CAUTION	*1. ONLY transfer fuel of the outer tanks if refueling is planned at destination. Refueling will ensure that a standard fuel distribution will be respected for the next flight.* *2. Do not manually transfer fuel of the outer tanks before landing. Fuel is required in the outer tanks in flight, in order to reduce the wing stress.*

AFTER THE OUTER TANK FUEL HAS TRANSFERRED, OR BEFORE LEAVING THE COCKPIT:

OUTR TK XFR...AUTO

L2 *If the OUTR TK XFR pb-sw is not in the AUTO position when the next refueling starts, the END light on the refuel control panel will flash and the refueling will not start. Setting the OUTR TK XFR pb-sw to AUTO will enable the refueling to start.*

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GPS INTERFERENCES

Ident.: PRO-NOR-SUP-GPSINT-A-00025192.0001001 / 26 JAN 22
Applicable to: ALL

Radio frequency interferences can affect the GPS data and the aircraft functions that use GPS data. Due to the various levels of interference, the GPS data can be maintained, degraded or lost. The associated sequence of cockpit effects cannot be predicted.
The following table provides a list of cockpit effects that may occur during the GPS interferences:

Ident.: PRO-NOR-SUP-GPSINT-A-00025201.0001001 / 26 JAN 22
Applicable to: ALL

Function	PFD/ND	ECAM Alert	ECAM Status	Other Effects

Ident.: PRO-NOR-SUP-GPSINT-A-00025207.0002001 / 26 JAN 22
Applicable to: ALL

ADS-B OUT		NAV ADS-B RPTG 1(2) FAULT	ADS-B RTPG	

Ident.: PRO-NOR-SUP-GPSINT-A-00025208.0001001 / 26 JAN 22
Applicable to: ALL

Aircraft position		NAV FM/GPS POS DISAGREE		

Ident.: PRO-NOR-SUP-GPSINT-A-00025212.0001001 / 26 JAN 22
Applicable to: ALL

GPS	GPS PRIMARY LOST	NAV GPS 1(2)(1+2) FAULT	GPS 1(2)(1+2)	

Ident.: PRO-NOR-SUP-GPSINT-A-00025214.0002001 / 26 JAN 22
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

ROW/ROPS		SURV ROW/ROP LOST	ROW/ROP	

Ident.: PRO-NOR-SUP-GPSINT-A-00025215.0001001 / 09 NOV 23
Applicable to: ALL

TAWS		NAV GPWS TERR DET FAULT NAV GPWS FAULT	GPWS TERR GPWS	Erroneous terrain alerts.

Ident.: PRO-NOR-SUP-GPSINT-A-00025216.0001001 / 26 JAN 22
Applicable to: ALL

Time predictions				Erroneous time and FMS predictions (time drifts or jumps).

Ident.: PRO-NOR-SUP-GPSINT-A-00025217.0002001 / 26 JAN 22
Applicable to: ALL

SATCOM				Degraded voice/datalink communications.

Ident.: PRO-NOR-SUP-GPSINT-A-00025218.0001001 / 26 JAN 22
Applicable to: ALL

Wind information	Erroneous wind speed and direction.			

Ident.: PRO-NOR-SUP-GPSINT-A-00026523.0001001 / 09 NOV 23
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

XLS				Non availability of Pre-Capture Zone of the LOC Beam

Ident.: PRO-NOR-SUP-GPSINT-A-00025189.0001001 / 09 NOV 23
Applicable to: ALL

When the flight crew suspects that there is an interference on GPS due to the cockpit effects, the flight crew can check the GPS data.
The GPS MONITOR page displays dashes on GPS positions, and/or the number of tracked satellites may be lower than 5 or null, in the case of GPS interference.
The flight crew should keep the GPS selection on the SELECTED NAVAIDS page. This allows the aircraft to recover the degraded or lost functions based on GPS data (e.g. GPS PRIMARY), as soon as the aircraft is out of the interference.
When ADS-B OUT ◁ is required in the flight area, the flight crew should notify ATC of any loss of ADS-B OUT ◁ .

■ If NOTAMs (from Authority or Company) indicate a GPS interference area, and the aircraft is expected to fly in or near interference zone:

● Flight Preparation

The flight crew should consider the following:
- The possibility to identify the entry and exit points of the interference area
- The possible effects of GPS interference on flight operations
- The availability of alternate routes
- The availability of routes, procedures and approaches that do not require GPS (e.g. ILS, VOR/DME) for the affected area. *Refer to PRO-SPO-51 General - General*.

● Preliminary Cockpit Preparation

Perform a complete IRS alignment if the flight crew expects long segments in airspaces with low radio NAVAIDS coverage.

- **Before the Interference Area (Before Departure or during the Flight)**

  In order to maintain the ATC datalink communication (ADS-C, CPDLC and PBCS) and the FMS predictions, the flight crew should apply the following:

  CLOCK...INT

L2 *If the clock was previously synchronized with the GPS, the INT mode of the clock maintains the ATC datalink capabilities for 24 h.* Refer to DSC-31-55-20 Operation in Internal Mode

L1
- **After the Interference Area**

  GPS MODE..CHECK

L2 *Check that the GPS MONITOR page displays GPS 1 in NAV mode with at least 5 satellites tracked.*

L1 CLOCK...GPS

L2 *The clock should remain on INT mode until the GPS NAV mode is recovered.*

L1
■ **If no NOTAMs indicate a GPS interference area on the expected route and the flight crew suspects interference on the GPS during the flight:**

The flight crew should notify ATC of any interference on the GPS during the flight.

During the flight, the flight crew may detect an erroneous time reference due to suspected GPS interference.

In order to maintain the FMS predictions, the flight crew should consider the following:

ATC...TIME CHECK

L2 *Crosscheck the external time reference with the clock.*

L1
- **If the ATC time is different from the time displayed on the clock:**

  CLOCK...SET

  Note: *Manually enter the time data on the clock, based on the external time reference.*

  CLOCK...INT

  Note: *When the clock is switched to INT mode after manual entry in SET mode, the flight crew should consider that the ATC datalink communication (CPDLC, ADS-C and PBCS) is unavailable.* Refer to DSC-31-55-20 Operation in Internal Mode

  - **After the Interference Area**

    GPS MODE..CHECK

L2 *Check that the GPS MONITOR page displays GPS 1 in NAV mode with at least 5 satellites tracked.*

L1 CLOCK...GPS

L2 *The clock should remain in INT mode until the GPS NAV mode is recovered.*

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Flight With Landing Gear Down

FLIGHT WITH LANDING GEAR DOWN

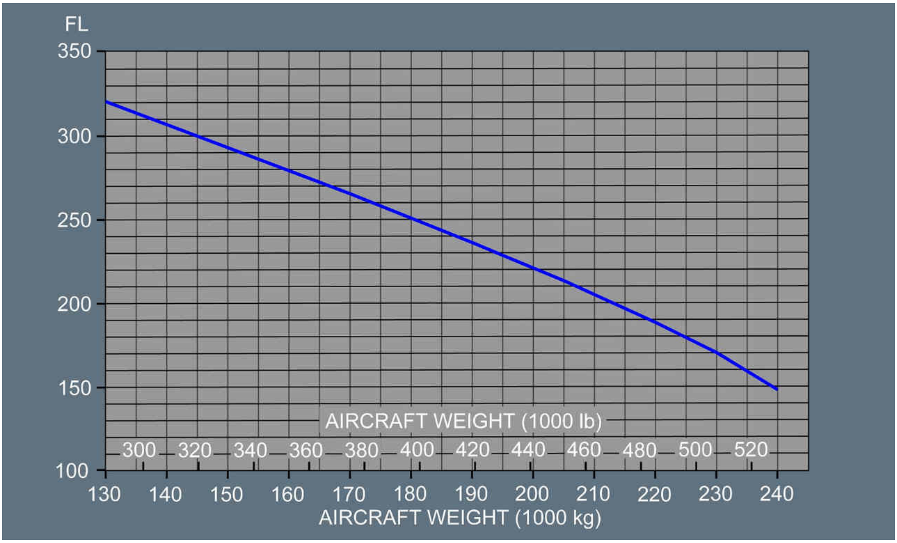
Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023771.0001001 / 17 NOV 20
Applicable to: ALL

This chapter applies to dispatch with L/G down. A revenue flight is permitted with the L/G down, and the L/G gear doors closed in the conditions stated below.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023772.0012001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

FLIGHT PREPARATION - LIMITATIONS

Maximum Altitude



L2 The aircraft must remain at or below the altitude provided in the figure above to provide at least 20 kt margin between VLS and VMO/MMO with gear down.

L1 MAX SPEED : 255/.60

L2 *VMO/MMO for a flight with the L/G in the extended position and L/G doors closed is 255 kt/M 0.60.*

L1 RECOMMENDED SPEED : 240/.52

L2 240 kt/M 0.52 is the recommended speed for climb, cruise, and descent.

L1 LANDING GEAR DOORS..CHECK CLOSED

TCAS...TA ONLY
FUEL AFT TRANSFER INOP
ALTITUDE ALERT : NOT AVAIL
FLT IN EXPECTED ICING CONDITIONS : NOT PERMITTED

L2 *Due to the possible ice accretion on the L/G, flight is not permitted in expected icing conditions.*

L1 RVSM : NOT PERMITTED
ETOPS : NOT PERMITTED

DITCHING NOT DEMONSTRATED

DERATE CLB : DO NOT USE

L2 *Because the DERATE function is not designed to be used with the L/G in the extended position, the flight crew must select CLB (maximum climb) thrust for climb.*

L1 MANAGED VERTICAL MODES (CLB & DES) : DO NOT USE

L2 *Due to the L/G in the extended position in flight, the FMS vertical guidance is not accurate.*

L1 MANAGED SPEED (EXCEPT IN APPR) : DO NOT USE
FMS PRED (ALT, SPD, TIME & PSEUDO-WPT) : DO NOT USE

Note: However, in level flight, time predictions at cruise waypoints are correct.

FUEL CONSUMPT INCRSD

FMS FUEL PRED UNRELIABLE

SIGNS AUTO MODE : DO NOT USE

L2 *Because the L/G is in the extended position, the signs remain on during the whole flight if the AUTO mode is used.*

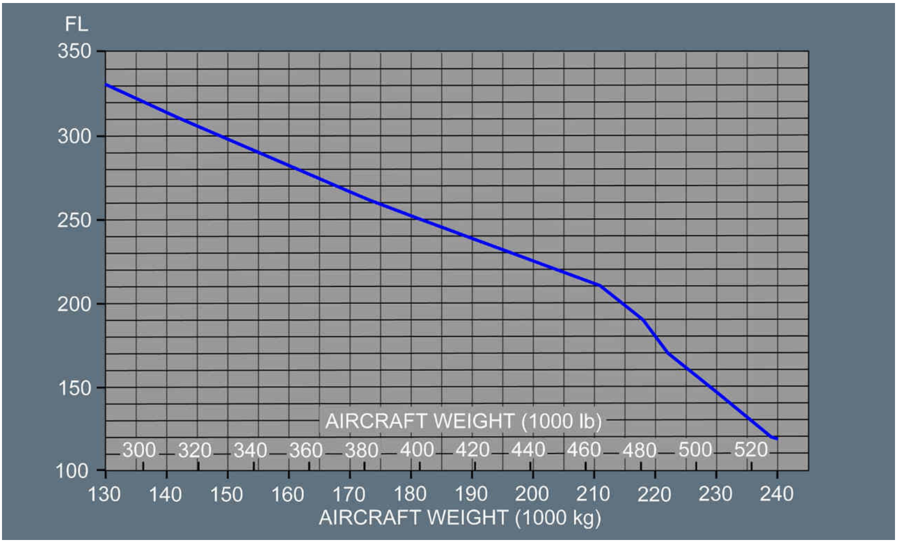
L1 CRUISE SD PAGE NOT AVAIL

L2 Because the L/G is in the extended position, the default SD page is the WHEEL SD page. The flight crew should check the other SD pages more frequently.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023772.0008001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

FLIGHT PREPARATION - LIMITATIONS

Maximum Altitude



L2 The aircraft must remain at or below the altitude provided in the figure above to provide at least 20 kt margin between VLS and VMO/MMO with gear down.

L1 MAX SPEED : 255/.60

L2 *VMO/MMO for a flight with the L/G in the extended position and L/G doors closed is 255 kt/M 0.60.*

L1 RECOMMENDED SPEED : 240/.56

L2 240 kt/M 0.56 is the recommended speed for climb, cruise, and descent.

L1 LANDING GEAR DOORS..CHECK CLOSED
TCAS..TA ONLY
FUEL AFT TRANSFER INOP
ALTITUDE ALERT : NOT AVAIL
FLT IN EXPECTED ICING CONDITIONS : NOT PERMITTED

L2 *Due to the possible ice accretion on the L/G, flight is not permitted in expected icing conditions.*

L1 RVSM : NOT PERMITTED
ETOPS : NOT PERMITTED

DITCHING NOT DEMONSTRATED

DERATE CLB ◁ : DO NOT USE

L2 *Because the DERATE function ◁ is not designed to be used with the L/G in the extended position, the flight crew must select CLB (maximum climb) thrust for climb.*

L1 MANAGED VERTICAL MODES (CLB & DES) : DO NOT USE

L2 *Due to the L/G in the extended position in flight, the FMS vertical guidance is not accurate.*

L1 MANAGED SPEED (EXCEPT IN APPR) : DO NOT USE
FMS PRED (ALT, SPD, TIME & PSEUDO-WPT) : DO NOT USE

Note: *However, in level flight, time predictions at cruise waypoints are correct.*

FUEL CONSUMPT INCRSD

FMS FUEL PRED UNRELIABLE

SIGNS AUTO MODE ◁ : DO NOT USE

L2 *Because the L/G is in the extended position, the signs remain on during the whole flight if the AUTO mode ◁ is used.*

L1 CRUISE SD PAGE NOT AVAIL

L2 Because the L/G is in the extended position, the default SD page is the WHEEL SD page. The flight crew should check the other SD pages more frequently.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023773.0003001 / 17 MAY 21
Applicable to: ALL

DURING PRELIMINARY COCKPIT PREPARATION

ECAM/LOGBOOK CHECK

FLT L/G DOWN MEMO..CHECK DISPLAYED

L2 *The ground crew should set the VMO/MMO switch on the "L/G DOWN" position. The FLT L/G DOWN memo on the ECAM indicates this position.*

L1 **TAKEOFF PERF**

RECOMMENDED FLAPS : CONF 1+F

L2 *CONF 1+F configuration gives a lower drag.*

L1 AVOID TAILWIND
T.O PERF WITH L/G DOWN..COMPUTE

L2 *Takeoff performance is affected, compute takeoff performance with the L/G in the extended position.*

L1 *Note:* *In the Airbus EFB T.O PERF application, select the "Landing Gear Position Extended" MEL item.*

LANDING PERF (DISPATCH)

LDG PERF WITH L/G DOWN.. CHECK

L2 *Landing performance (go-around gradient) is affected, check landing performance with the L/G in the extended position.*

L1 *Note: In the Airbus EFB LDG PERF application (DISPATCH computation mode), select the "Landing Gear Position Extended" MEL item.*

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023775.0014001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

DURING COCKPIT PREPARATION

OVERHEAD PANEL

SIGNS AUTO MODE ◁ : DO NOT USE

L2 *Because the L/G is in the extended position, the signs remain on during the whole flight if the AUTO mode ◁ is used.*

L1 **FMGS PREPARATION**

FMS FUEL PRED UNRELIABLE

Note: A conservative value for the fuel penalty is provided in the Fuel Penalty INOP SYS TABLE for L/G - L/G RETRACTION - All L/G extended (Refer to QRH/OPS Fuel Penalty Factors/Inop Sys Table).

RECOMMENDED SPEED : 240/.52

L2 240 kt/M 0.52 is the recommended speed for climb, cruise, and descent.

L1 [FMS-ACTIVE/PERF PAGES] PRESEL SPDs .... INSERT
[FMS-ACTIVE/PERF/CLB PAGE] THR — “CLB” ◁ .... INSERT

L2 *The derated climb thrust ◁ is not designed to be used with the L/G in the extended position. The flight crew must select maximum climb thrust (CLB) for climb.*

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023775.0010001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

DURING COCKPIT PREPARATION

OVERHEAD PANEL

SIGNS AUTO MODE ◁ : DO NOT USE

L2 *Because the L/G is in the extended position, the signs remain on during the whole flight if the AUTO mode ◁ is used.*

L1 **FMGS PREPARATION**

FMS FUEL PRED UNRELIABLE

Note: *A conservative value for the fuel penalty is provided in the Fuel Penalty INOP SYS TABLE for L/G - L/G RETRACTION - All L/G extended (Refer to QRH/OPS Fuel Penalty Factors/Inop Sys Table).*

RECOMMENDED SPEED : 240/.56

L2 240 kt/M 0.56 is the recommended speed for climb, cruise, and descent.

L1 [FMS-ACTIVE/PERF PAGES] PRESEL SPDs .... INSERT
[FMS-ACTIVE/PERF/CLB PAGE] THR — “CLB” .... INSERT

L2 *The derated climb thrust is not designed to be used with the L/G in the extended position. The flight crew must select maximum climb thrust (CLB) for climb.*

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023776.0001001 / 17 NOV 20
Applicable to: ALL

TAKEOFF

WHEN POSITIVE CLIMB

L/G : KEEP DOWN

AT S SPEED

A/BRK MAX...CHECK DISARMED

L2 *After standard actions, check that BRK MAX does not appear on the FMA.*

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023777.0012001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

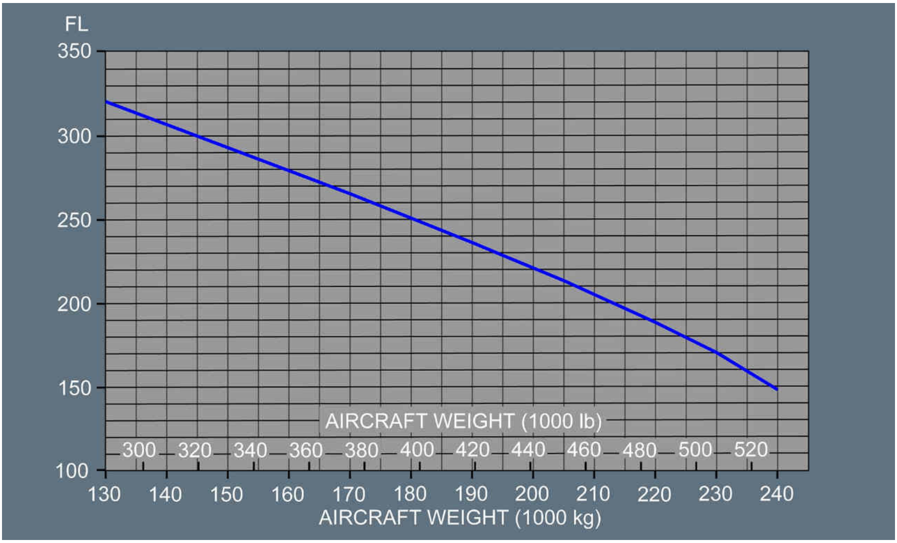
DURING CLIMB AND CRUISE

DERATE CLB : DO NOT USE

L2 *Because the DERATE function is not designed to be used with the L/G in the extended position, the flight crew must select CLB (maximum climb) thrust for climb.*

L1

Maximum Altitude



L2 The aircraft must remain at or below the altitude provided in the figure above to provide at least 20 kt margin between VLS and VMO/MMO with gear down.

L1 RVSM : NOT PERMITTED
AVOID ICING CONDITIONS

RECOMMENDED SPEED : 240/.52

L2 240 kt/M 0.52 is the recommended speed for climb and cruise.

L1

CRUISE SD PAGE NOT AVAIL

L2 Because the L/G is in the extended position, the default SD page is the WHEEL SD page. The flight crew should check the other SD pages more frequently.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023777.0008001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

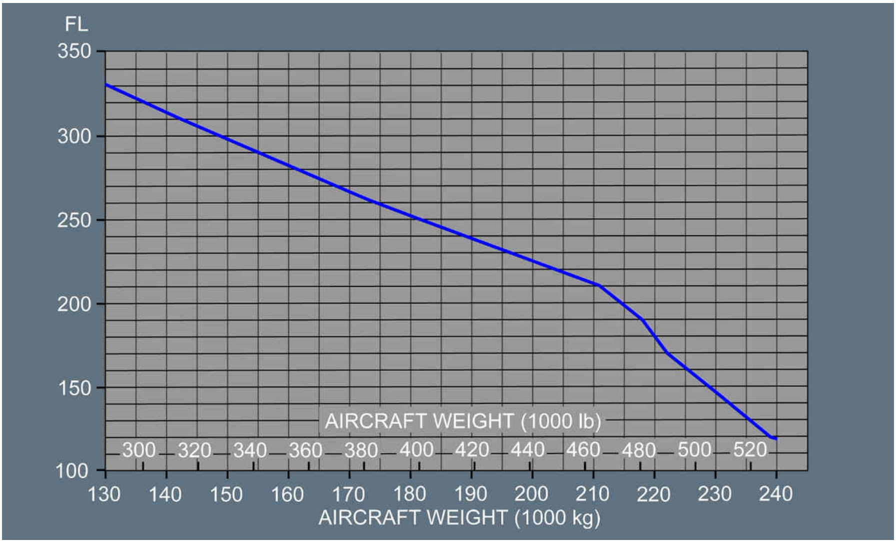
DURING CLIMB AND CRUISE

DERATE CLB ◁ : DO NOT USE

L2 *Because the DERATE function ◁ is not designed to be used with the L/G in the extended position, the flight crew must select CLB (maximum climb) thrust for climb.*

L1

Maximum Altitude



L2 The aircraft must remain at or below the altitude provided in the figure above to provide at least 20 kt margin between VLS and VMO/MMO with gear down.

L1 RVSM : NOT PERMITTED
AVOID ICING CONDITIONS

RECOMMENDED SPEED : 240/.56

L2 240 kt/M 0.56 is the recommended speed for climb and cruise.

L1

CRUISE SD PAGE NOT AVAIL

L2 Because the L/G is in the extended position, the default SD page is the WHEEL SD page. The flight crew should check the other SD pages more frequently.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023779.0005001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

LANDING PERFORMANCE

LDG PERF WITH L/G DOWN..CONFIRM

L2 *Go-around performance is affected.*

L1 *Note:* *In the Airbus EFB LDG PERF application (IN-FLIGHT computation mode), select the "Landing gears position extended" MEL item.*

FOR DESCENT AND APPROACH

RECOMMENDED SPEED : 240/.56

L2 240 kt/M 0.56 is the recommended speed for descent.

L1 DESCENT SELECTED V/S MODE...CONSIDER

L2 *To avoid a high rate of descent due to the L/G in the extended position, consider using selected vertical speed.*

L1 AVOID ICING CONDITIONS

FOR HOLDING : CONF 1 RECOMMENDED

L2 Slats extended is the least penalizing configuration.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023779.0008001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

LANDING PERFORMANCE

LDG PERF WITH L/G DOWN...CONFIRM

L2 *Go-around performance is affected.*

L1 *Note:* *In the Airbus EFB LDG PERF application (IN-FLIGHT computation mode), select the "Landing gears position extended" MEL item.*

FOR DESCENT AND APPROACH

RECOMMENDED SPEED : 240/.52

L2 240 kt/M 0.52 is the recommended speed for descent.

L1 DESCENT SELECTED V/S MODE...CONSIDER

L2 *To avoid a high rate of descent due to the L/G in the extended position, consider using selected vertical speed.*

L1 AVOID ICING CONDITIONS

FOR HOLDING : CONF 1 RECOMMENDED

L2 Slats extended is the least penalizing configuration.

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023780.0001001 / 17 NOV 20
Applicable to: ALL

GO-AROUND

GO-AROUND INITIATION

ALL THR LEVERS...TOGA

WHEN POSITIVE CLIMB

L/G : KEEP DOWN

Ident.: PRO-NOR-SUP-LG-DN-SUP-LG-00023778.0001001 / 05 MAY 22
Applicable to: ALL

ABNORMAL PROCEDURES

ENGINE FAILURE

GREEN DOT SPD (FINAL TAKEOFF, GO-AROUND, DRIFT DOWN) : DO NOT USE

L2 *The Green Dot speed displayed by the PFD does not take into account the extended position of the L/G. The flight crew should use the speed mentioned in the TAKEOFF / GO-AROUND and EN-ROUTE sections below instead of green dot when required.*

L1 TAKEOFF / GO-AROUND

- **After acceleration, and when flaps/slats are retracted:**

  SPEED.. SELECT VLS + 11KT

L2 *The flight crew should select VLS + 11 kt instead of Green Dot.*

L1
- **When VLS + 11 kt is reached:**

  ALT KNOB.. PULL
  THR LEVER (REMAINING ENG).. MCT

EN-ROUTE

DRIFT-DOWN SPEED : VLS + 11KT

L2 The flight crew should use VLS + 11 kt instead of Green Dot as drift-down speed.

L1 EO MAX ALT.. COMPUTE

L2 *The EO MAX ALT displayed by the FMS does not take into account the extended position of the L/G. The flight crew should use an alternate source to determine the EO maximum altitude.*

L1 *Note:* *In the Airbus IN-FLT PERF application (DES (OEI) panel):*

- *Select the "L/G DISPATCH WITH GEAR DOWN" NON STD CONF item*
- *Select DES TYPE: OBSTACLE and SPD TYPE: Green Dot for a descent at drift-down speed, or DES TYPE: EO STANDARD for a descent at fixed speed.*

Operation with Nosewheel Steering Offset

OPERATION WITH NOSEWHEEL STEERING OFFSET

Applicable to: ALL

Ident.: PRO-NOR-SUP-LG-LG-A-00020816.0001001 / 20 MAR 17

During taxi in a straight line, the crew may notice aircraft veering tendency. This can be due to external conditions (crosswind, slope...) or to a nosewheel steering offset.
A nosewheel steering offset is usually notified through consecutive crew reports. The NWS offset value is determined regarding the necessary rudder trim input used to cancel the veering tendency.

Ident.: PRO-NOR-SUP-LG-LG-A-00020817.0005001 / 23 OCT 18

When the NWS offset is within admissible limits, the flight crew can operate the aircraft as follows:

CAUTION	A rudder trim reset must be performed before takeoff. When the rudder trim adjustment is above the maintenance tolerance (±0.5 ° NWS offset, corresponding to the ±3 ° rudder trim necessary to taxi straight), the flight crew must systematically and accurately report the rudder trim value in the logbook.

NWS Offset	Necessary Rudder Trim Input	Procedure
Offset ≤ 0.8 °	Trim ≤ 4.5 °	● **Taxi:** RUDDER TRIM....................ADJUST Adjust trim until the aircraft taxies in a straight line. Check input value. ● **Before takeoff:** RUDDER TRIM....................RESET
0.8 ° < Offset ≤ 2 °	4.5 °< Trim ≤ 10.4 °	● **Taxi:** RUDDER TRIM....................ADJUST Adjust trim until the aircraft taxies in a straight line. Check input value. ● **Before takeoff:** RUDDER TRIM....................RESET ● **Landing:** DIFF BRK....................AS RQRD ● **For manual landing:** MAX CROSSWIND....................25 kt ● **For autoland:** MAX CROSSWIND....................14 kt
Offset > 2 °	Trim > 10.4 °	MAINTENANCE ACTION....................REQUEST Do not attempt takeoff. Request for troubleshooting.

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Flight without Cabin Pressurization

FLIGHT WITHOUT CABIN PRESSURIZATION

Ident.: PRO-NOR-SUP-MISC-C-A-00024593.0001001 / 17 NOV 20
Applicable to: ALL

This chapter applies to dispatch under MMEL/MCDL or following a structural damage.

Ident.: PRO-NOR-SUP-MISC-C-A-00024594.0001001 / 17 NOV 20
Applicable to: ALL

DURING PRELIMINARY COCKPIT PREPARATION

- **If both packs are inoperative:**
  FLIGHT WITH NO PASSENGERS.. CHECK

L2 *Dispatch for a flight with both packs inoperative is not allowed with passengers.*

L1 **OXYGEN FOR FLIGHT CREW MEMBERS**

CKPT OXYGEN PRESSURE..CHECK

L2 *To obtain the requirements in oxygen for flight crew members, refer to FAR 121.329 or AIR-OPS CAT.IDE.A.235, or any other applicable operational regulation.*
For more information on oxygen limitations for flight crew members, Refer to LIM-OXY Minimum Flight Crew Oxygen Pressure.

L1 **OXYGEN FOR CABIN OCCUPANTS**

OXYGEN FOR CABIN OCCUPANTS..CHECK

L2 *To obtain the requirements in oxygen for cabin occupants, refer to FAR 121.329 or AIR-OPS CAT.IDE.A.235, or any other applicable operational regulation.*

Ident.: PRO-NOR-SUP-MISC-C-A-00024595.0002001 / 05 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

DURING COCKPIT PREPARATION

FLIGHT PLAN INITIALIZATION

MAX SPEED: 250 kt
MAX CRZ FL: 100/MSA

If the altitude of the aircraft cabin reaches 14 000 ft, the cabin oxygen masks will automatically drop.

The flight crew must decide the minimum aircraft altitude, depending on:
- The MSA
- Oxygen requirements

- Turbulence, that can be uncomfortable for passengers
- Possible low OAT, that can be uncomfortable for passengers when the aircraft is ventilated by emergency ram air only.

● **If aircraft cruise FL is above FL 95:**

EXPECT CAB PR EXCESS CAB ALT ALERT

● **If both packs are inoperative:**

PACK 1..OFF
PACK 2..OFF
RAM AIR..ON

● **If both automatic cabin pressure control systems are inoperative, or if there is structural damage:**

TEST OF THE MANUAL OPERATION OF BOTH OUTFLOW VALVES ON GROUND:

PACK 1..OFF
PACK 2..OFF
BOTH OUTFLOW VALVES FULLY OPEN..CHECK

L2 *Check that the outflow valves are fully open on the CAB PRESS SD page.*

L1 RPCU SPLY C/B (on 721VU in avionics compartment)..PULL
CABIN PRESS MODE SEL..MAN
MAN VALVE SEL..BOTH
MAN V/S CTL..DN

L2 *Check that the FWD and AFT outflow valves are fully closed on the CAB PRESS SD page.*

L1 MAN V/S CTL..UP

L2 *Check that the FWD and AFT outflow valves are fully open on the CAB PRESS SD page.*

L1 CABIN PRESS MODE SEL..AUTO
RPCU SPLY C/B (on 721VU in avionics compartment)..PUSH
PACK 1..ON
PACK 2..ON

Ident.: PRO-NOR-SUP-MISC-C-A-00024595.0001001 / 05 MAY 22
Applicable to: LV-GKO, LV-GKP

DURING COCKPIT PREPARATION

FLIGHT PLAN INITIALIZATION

MAX SPEED: 250 kt
MAX CRZ FL: 100/MSA

If the altitude of the aircraft cabin reaches 14 000 ft, the cabin oxygen masks will automatically drop.

The flight crew must decide the minimum aircraft altitude, depending on:
- The MSA
- Oxygen requirements
- Turbulence, that can be uncomfortable for passengers
- Possible low OAT, that can be uncomfortable for passengers when the aircraft is ventilated by emergency ram air only.

● **If aircraft cruise FL is above FL 95:**

EXPECT CAB PR EXCESS CAB ALT ALERT

● **If both packs are inoperative:**

PACK 1..OFF
PACK 2..OFF
RAM AIR..ON

● **If both automatic cabin pressure control systems are inoperative, or if there is structural damage:**

PACK 1..ON
PACK 2..ON
CABIN PRESS MODE SEL..MAN
MAN VALVE SEL..BOTH
MAN V/S CTL..AS RQRD

L2 *Use MAN V/S CTL sw to set the outflow valve opening to 50 %.*

L1 BOTH OUTFLOW VALVES HALF OPEN..CHECK

L2 *The outflow valves opening is limited to 50 %, to avoid cabin air suction effect.*

Ident.: PRO-NOR-SUP-MISC-C-A-00024596.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AFTER TAKEOFF

FOR PAX AND CREW COMFORT:

AVOID EXCESSIVE RATE OF CLIMB (MAX: +1 000 ft/min)
AVOID EXCESSIVE RATE OF DESCENT (MAX: -500 ft/min)

L2 *In the case of a door failure or a structural damage, the flight crew must ensure that the differential pressure remains equal to 0 PSI during the whole flight.*

L1

- **If both automatic cabin pressure control systems are inoperative, or if there is structural damage:**
  - **When in clean configuration:**

    MODE SEL.. MAN
    MAN VALVE SEL.. BOTH
    MAN V/S CTL.. AS RQRD

L2 *Use MAN V/S CTL sw to set the outflow valve opening to 50 %.*

L1 BOTH OUTFLOW VALVES HALF OPEN..CHECK

L2 *The outflow valves opening is limited to 50 %, to avoid cabin air suction effect.*

L1 **ECAM ALERT**

- **If aircraft/cabin altitude is above 9 550 ft:**

  EXPECT CAB PR EXCESS CAB ALT ALERT

  ECAM CLR.. CONSIDER

Ident.: PRO-NOR-SUP-MISC-C-A-00024596.0001001 / 10 MAY 21
Applicable to: LV-GKO, LV-GKP

AFTER TAKEOFF

FOR PAX AND CREW COMFORT:

AVOID EXCESSIVE RATE OF CLIMB (MAX: +1 000 ft/min)
AVOID EXCESSIVE RATE OF DESCENT (MAX: -500 ft/min)

L2 *In the case of a door failure or a structural damage, the flight crew must ensure that the differential pressure remains equal to 0 PSI during the whole flight.*

L1 **ECAM ALERT**

- **If aircraft/cabin altitude is above 9 550 ft:**

  EXPECT CAB PR EXCESS CAB ALT ALERT

  ECAM CLR.. CONSIDER

High Altitude Airport Operations

HIGH ALTITUDE AIRPORT OPERATIONS

Ident.: PRO-NOR-SUP-MISC-A-00020513.0001001 / 05 MAY 22
Applicable to: ALL

The STANDARD OPERATING PROCEDURES and ABNORMAL and EMERGENCY PROCEDURES remain applicable for operation at high altitude airfields.

CAB PRESS SYSTEM

TAKEOFF

TAKEOFF WITH BOTH PACKS OFF : DO NOT PERFORM

L2 *Takeoff with both packs off may trigger the CAB PR EXCESS CAB ALT.*

L1 APU BLEED... AS RQRD

If required for takeoff performance, takeoff must be performed with:

- Both packs running supplied by APU bleed, *Refer to LIM-APU APU Bleed*, or
- One pack running supplied by APU bleed (if permitted), *Refer to LIM-APU APU Bleed*.

In case the aircraft takes off from an airfield higher than 8 000 ft the cabin altitude remains at takeoff altitude until the cruise conditions are fulfilled. After level off the cabin altitude is controlled to the scheduled cruise cabin altitude. On the ECAM PRESS page or CRUISE page it can be observed that the cabin altitude starts changing approximately 30 s after level off.

HYD SYSTEM

- **On ground, if the HYD Y(B)(G) RSVR LO AIR PR alert triggers:**

  Before engine start: SWITCH OFF AFFECTED HYD PUMP.

  Note: *This action allows reservoir pressurization before hydraulic pump operation.*

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Operations at QNH above 1050 hPa

GENERAL

Ident.: PRO-NOR-SUP-MISC-B-00001773.0023001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

Some airlines may occasionally experience high barometric correction settings above 1 050 hPa, or 31.0 inHg, on some airfields. This is due to polar anticyclonic air mass conditions that occur near the polar area during winter.
The FMS, FCU, ISIS instrument, PFD, and CPCS are capable of operating at QNH/QFE up to 1 100 hPa, or 32.48 inHg.
In addition, the ATC/TCAS operates only up to 1 050 hPa (i.e. as long as the aircraft altitude remains above -1 000 ft standard pressure altitude).
Therefore, when using QNH, or QFE for QFE pin-programmed aircraft, for departure and arrival, the crew should be aware of the consequences outlined below, and should apply the corresponding procedures.
Therefore, it is necessary for the airline to obtain operational approval from its national Airworthiness Authorities.

GENERAL

Ident.: PRO-NOR-SUP-MISC-B-00001773.0046001 / 07 FEB 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

Some airlines may occasionally experience high barometric correction settings above 1 050 hPa, or 31.0 inHg, on some airfields. This is due to polar anticyclonic air mass conditions that occur near the polar area during winter.
The FCU, ISIS instrument, PFD, and CPCS are capable of operating at QNH/QFE up to 1 100 hPa, or 32.48 inHg.
The FMGES is currently limited to 1 050 hPa for DEST QNH entry on the MCDU PERF APPR page (i.e. as long as the aircraft altitude remains above -1 000 ft standard pressure altitude).
In addition, the ATC/TCAS operates only up to 1 050 hPa (i.e. as long as the aircraft altitude remains above -1 000 ft standard pressure altitude).
Therefore, when using QNH, or QFE for QFE pin-programmed aircraft, for departure and arrival, the crew should be aware of the consequences outlined below, and should apply the corresponding procedures.
Therefore, it is necessary for the airline to obtain operational approval from its national Airworthiness Authorities.

CONSEQUENCES

Ident.: PRO-NOR-SUP-MISC-B-00001774.0055001 / 20 MAR 17
Applicable to: LV-KHT, LV-KHU

ON THE ATC-TCAS:

For takeoff, approach, and landing, the ATC altitude reporting and the TCAS TA/RA function may generate erroneous altitude information and nuisance TCAS alerts for other aircraft, if the aircraft standard altitude is below -1 000 ft standard pressure altitude. To avoid this, it is recommended: To set ALT RPTG to OFF, when the QNH exceed 1 050 hPa, and to inform the ATC. TCAS reverts to STBY mode.

CONSEQUENCES

Ident.: PRO-NOR-SUP-MISC-B-00001774.0053001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

ON THE ATC-TCAS:

For takeoff, approach, and landing, the ATC altitude reporting and the TCAS TA/RA function may generate erroneous altitude information and nuisance TCAS alerts for other aircraft, if the aircraft standard altitude is below -1 000 ft standard pressure altitude. To avoid this, it is recommended: To set ALT RPTG to OFF, when the QNH exceed 1 050 hPa, and to inform the ATC. TCAS reverts to STBY mode.

ON CABIN PRESSURIZATION:

The CPCS normally uses the MCDU DEST QNH value to regulate cabin pressure during descent. However, since DEST QNH entries on the MCDU are limited to 1 050 hPa, no DEST QNH value should be entered during descent preparation, in order to avoid incorrect cabin pressure regulation. As a backup, the CPCS will use the actual FCU barometric setting (when switching from STD to BARO reference).

Note: *As no DEST QNH is entered, the FMS initially assumes that Standard barometric reference will be kept down to destination for descent flight path calculations. When QNH is set on the FCU, the aircraft and cabin altitude will be higher than expected (the aircraft altitude can be up to 2 000 ft higher). This will lead to a higher descent rate, with a possible "CAB PR LO DIFF PR" ECAM caution, and possible opening of the cabin pressure safety valve.*

ON THE FMS:

DESCENT PROFILE:

In the descent phase, when the crew switches from Standard to Barometric reference, the FMS tries to catch up with an altitude increase induced by the BARO reference change. This altitude difference may be up to +2 000 ft, depending on the QNH value.
However, the FMS predictions and the VDEV remain unchanged.
Consequently, an altitude constraint just below the Descent Transition Level, may still be predicted as "satisfied", and actually flown with a positive error. This altitude difference will gradually be zeroed, as the aircraft catches up with the descent profile.

Note: *As no DEST QNH value is entered on the MCDU PERF APPR page, the FMS is unable to compute the Descent Transition Level. So, the "STD" BARO reference on the PFD will not flash when descending through the Transition Level.*

PROCEDURES

Ident.: PRO-NOR-SUP-MISC-B-00001776.0003001 / 20 MAR 17
Applicable to: LV-KHT, LV-KHU

BEFORE TAKEOFF

ALT RPTG .... OFF

L2 *ALT RPTG OFF memo and TCAS STBY memo appear on the WD.*

L1 ATC.. NOTIFY

L2 *Notify the ATC that the altitude reporting is not available.*

L1 TAKEOFF

- **Above 1 000 ft, when time permits:**

  ALT RPTG .... ON

L2 *As a result, the TCAS automatically reverts to its previous setting*

L1 APPROACH

- **Before final approach:**

  ATC.. NOTIFY

L2 *Notify the ATC that the altitude reporting will be turned off.*

L1 ALT RPTG .... OFF

PROCEDURES

Ident.: PRO-NOR-SUP-MISC-B-00001776.0023001 / 20 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

BEFORE TAKEOFF

ALT RPTG .... OFF

L2 *ALT RPTG OFF memo and TCAS STBY memo appear on the WD.*

L1 ATC .... NOTIFY

L2 *Notify the ATC that the altitude reporting is not available.*

L1 TAKEOFF

- **Above 1 000 ft, when time permits:**

  ALT RPTG .... ON

L2 *As a result, the TCAS automatically reverts to its previous setting*

L1 DESCENT PREPARATION

DO NOT INSERT a DEST QNH value on the MCDU PERF APPR page.

- **For QFE use:**

  LDG ELEV .... SET TO 0

APPROACH

- **Before final approach:**

  ATC .... NOTIFY

L2 *Notify the ATC that the altitude reporting will be turned off.*

L1 ALT RPTG .... OFF

AUTOMATIC DEPENDENT SURVEILLANCE - BROADCAST (ADS-B)

Ident.: PRO-NOR-SUP-SURV-00020835.0004001 / 17 MAR 17
Applicable to: ALL

ADS-B OUT:

In some cases, the ATC ground stations can receive non valid data from the ADS-B function.
Therefore, the air traffic controller may ask the flight crew to stop the transmission of the ADS-B data (e.g. the air traffic controller requests "STOP ADS-B TRANSMISSION" or "STOP ADS-B ALTITUDE TRANSMISSION").
The flight crew cannot switch off the ADS-B automatic data transmission independently of the XPDR.
Therefore, do not switch off the ATC transponder or the altitude reporting, in order to maintain TCAS operations or Air Traffic Controller radar surveillance.
In such cases, the flight crew must refer to local Aeronautical Information Publication (AIP) to apply alternate procedure when the air traffic controller requests to stop ADS-B transmission.

ADS-B IN:

The ATSAW ◁ enables the reception of ADS-B information from other aircraft in the vicinity.
Refer to the ATSAW section.

ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS)

Ident.: PRO-NOR-SUP-SURV-00020863.0001001 / 01 MAR 18
Applicable to: ALL

During climb, descent, approach and go-around phases:

- **If GPS PRIMARY ◁ is not available and FMS navigation accuracy check prevents the flight crew from using NAV mode in a phase of flight:**
  TERR pb-sw...OFF

  Note: Only the basic GPWS modes 1 to 5 remain operative.

Intentionally left blank

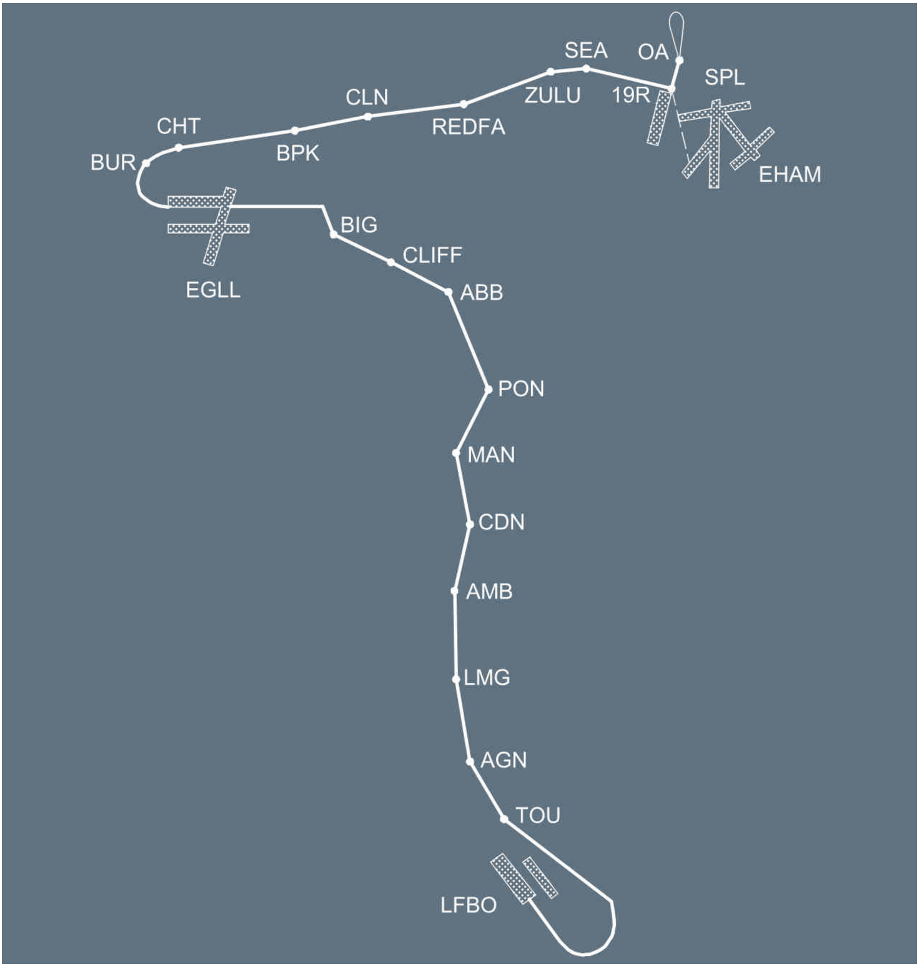
Introduction

INTRODUCTION

Ident.: PRO-NOR-SRP-01-05-00002449.0001001 / 09 OCT 12
Applicable to: ALL

Note: *This chapter is an amplification of the SOP. Anytime it was feasible, the same chapters and the same titles of paragraph were retained.*

The following discussion of the FMGS uses this flight plan as an example.


SEA
OA
SPL
CLN
ZULU
19R
CHT
REDFA
BUR
BPK
EHAM
BIG
CLIFF
EGLL
ABB
PON
MAN
CDN
AMB
LMG
AGN
TOU
LFBO

Cockpit Preparation

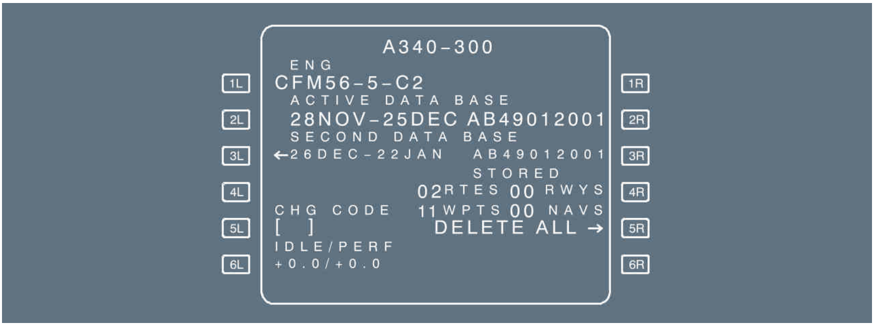
FMGES INITIALIZATION

Ident.: PRO-NOR-SRP-01-10-00002450.0001001 / 16 MAY 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

CHECKING THE CLOCK DATE

CHECK the CLOCK DATE and ADJUST if necessary.

If the date in the active database does not match the clock date, the MCDU displays "CHECK DATA BASE CYCLE". If this message appears, check the period of validity in the second database and select it, if required.



```
          A340-300
 ENG
CFM56-5-C2
 ACTIVE DATA BASE
 28NOV-25DEC AB49012001
 SECOND DATA BASE
←26DEC-22JAN   AB49012001
                 STORED
              02RTES 00RWYS
CHG CODE      11WPTS 00NAVS
[   ]          DELETE ALL →
IDLE/PERF
+0.0/+0.0
```

CAUTION	*Cycling the database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.*

CHECKING stored WAYPOINTS, NAVAIDS, RUNWAYS, or ROUTES

PRESS the DATA key.
PRESS the next page key [→] .

SELECT, successively, as required :
- STORED WAYPOINT
- STORED NAVAIDs
- STORED RUNWAYS
- STORED ROUTES

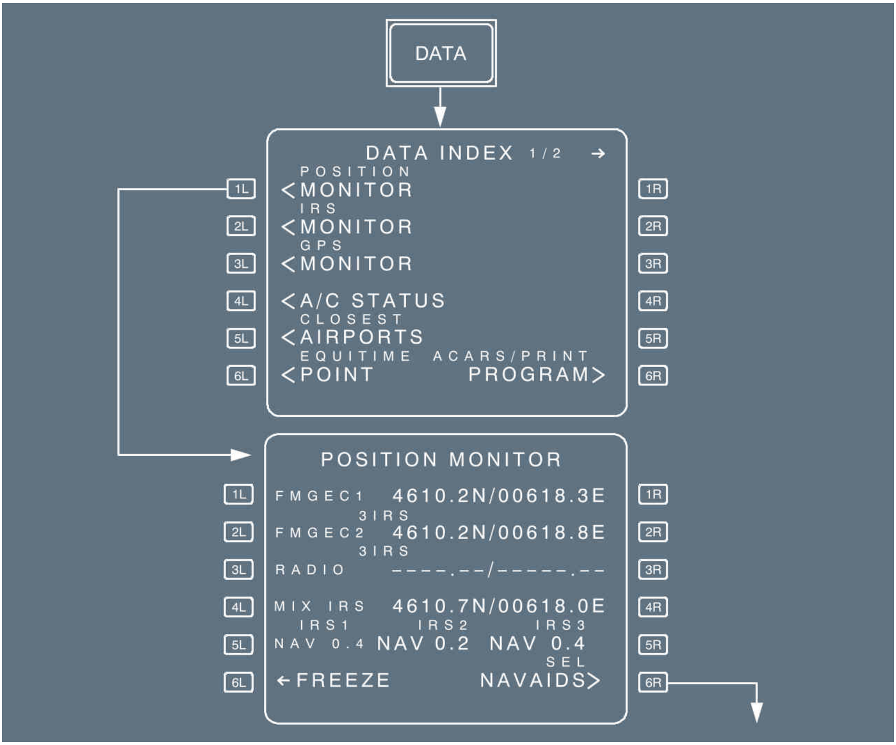
CHECK the contents of each of these data storages and DELETE items, as appropriate.

NAVAIDS DESELECTION

If NOTAMS indicate that selected NAVAIDs are unreliable or unserviceable, deselect them as follows:

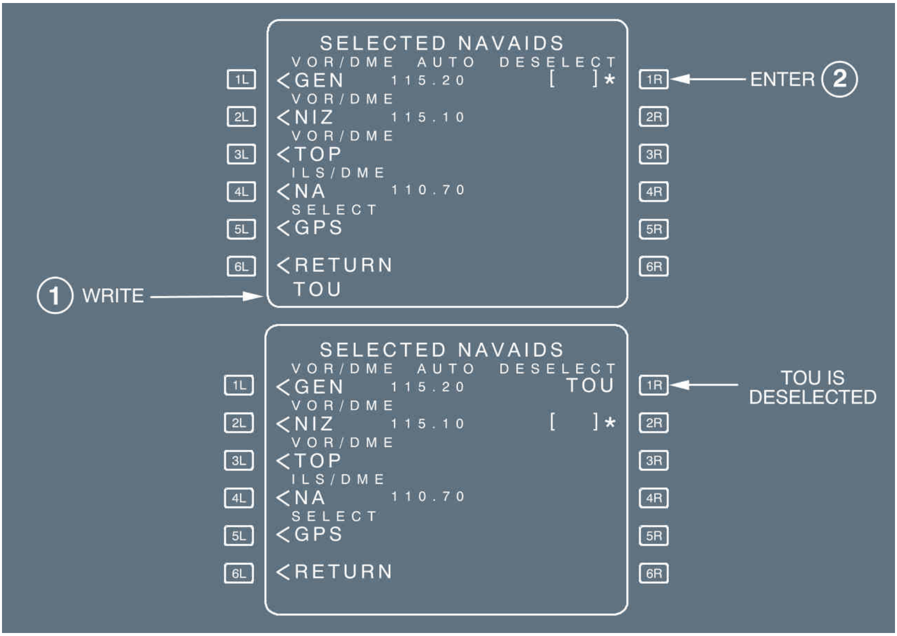
PRESS the DATA key
SELECT THE POSITION MONITOR page
SELECT the SELECTED NAVAIDs page
Under “DESELECT”, INSERT the NAVAID identifier into the brackets.

The pilot can make only six deselections.



DATA INDEX 1/2 →
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR
<A/C STATUS
CLOSEST
<AIRPORTS
EQUITIME ACARS/PRINT
<POINT PROGRAM>

POSITION MONITOR
FMGEC1 4610.2N/00618.3E
3IRS
FMGEC2 4610.2N/00618.8E
3IRS
RADIO ----.--/------.--
MIX IRS 4610.7N/00618.0E
IRS1 IRS2 IRS3
NAV 0.4 NAV 0.2 NAV 0.4
SEL
←FREEZE NAVAIDS>



```
       SELECTED NAVAIDS
 VOR/DME   AUTO   DESELECT
<GEN      115.20    [   ]*
 VOR/DME
<NIZ      115.10
 VOR/DME
<TOP
 ILS/DME
<NA       110.70
 SELECT
<GPS

<RETURN
 TOU
```

① WRITE

ENTER ②

```
       SELECTED NAVAIDS
 VOR/DME   AUTO   DESELECT
<GEN      115.20       TOU
 VOR/DME
<NIZ      115.10    [   ]*
 VOR/DME
<TOP
 ILS/DME
<NA       110.70
 SELECT
<GPS

<RETURN
```

TOU IS DESELECTED

FMGES INITIALIZATION

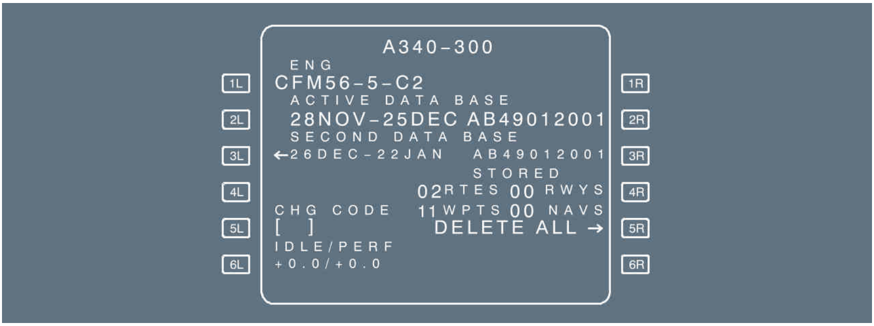
Ident.: PRO-NOR-SRP-01-10-00002450.0007001 / 01 OCT 12

Applicable to: LV-KHT, LV-KHU

CHECKING THE CLOCK DATE

CHECK the CLOCK DATE and ADJUST if necessary.

If the date in the active database does not match the clock date, the MCDU displays “CHECK DATA BASE CYCLE”. If this message appears, check the period of validity in the second database and select it, if required.



```
              A340-300
  ENG
 CFM56-5-C2
  ACTIVE DATA BASE
  28NOV-25DEC AB49012001
  SECOND DATA BASE
←26DEC-22JAN     AB49012001
                   STORED
              02RTES 00 RWYS
 CHG CODE     11WPTS 00 NAVS
 [   ]          DELETE ALL →
 IDLE/PERF
 +0.0/+0.0
```

CAUTION *Cycling the database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.*

CHECKING stored WAYPOINTS, NAVAIDS, RUNWAYS, or ROUTES

PRESS the DATA key.
PRESS the next page key [→] .

SELECT, successively, as required :
- STORED WAYPOINT
- STORED NAVAIDs
- STORED RUNWAYS
- STORED ROUTES

CHECK the contents of each of these data storages and DELETE items, as appropriate.

NAVAIDS DESELECTION

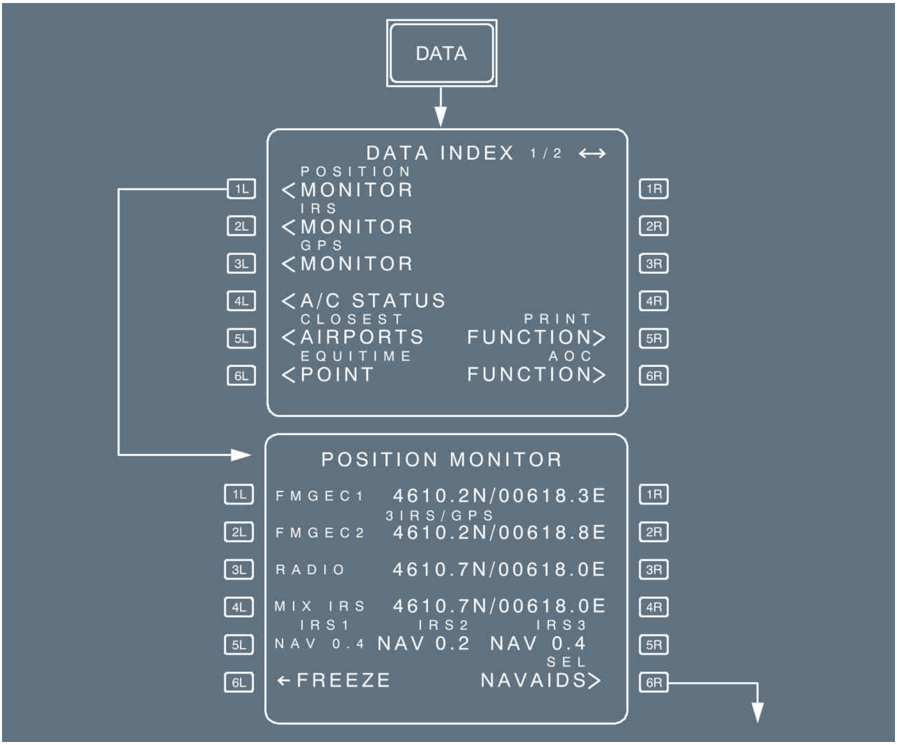
The flight crew can manually deselect all the RADIO navaids as follows:

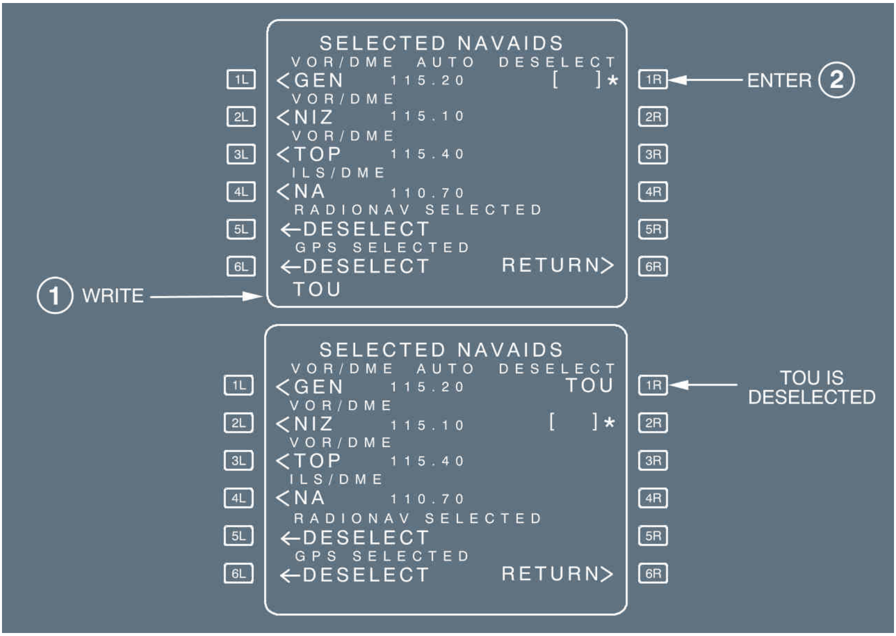
PRESS the DATA key
SELECT the POSITION MONITOR page
SELECT the SELECTED NAVAIDs page
Press [5L] to DESELECT all the radio navaids

If NOTAMS indicate that selected NAVAIDs are unreliable or unserviceable, deselect them as follows:

PRESS the DATA key
SELECT THE POSITION MONITOR page
SELECT the SELECTED NAVAIDs page
Under “DESELECT”, INSERT the NAVAID identifier into the brackets.

The pilot can make only four deselections.


DATA
DATA INDEX 1/2 ↔
POSITION
<MONITOR
IRS
<MONITOR
GPS
<MONITOR
<A/C STATUS
CLOSEST
<AIRPORTS
PRINT
FUNCTION>
EQUITIME
<POINT
AOC
FUNCTION>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
POSITION MONITOR
FMGEC1 4610.2N/00618.3E
3IRS/GPS
FMGEC2 4610.2N/00618.8E
RADIO 4610.7N/00618.0E
MIX IRS 4610.7N/00618.0E
IRS1
NAV 0.4
IRS2
NAV 0.2
IRS3
NAV 0.4
←FREEZE
SEL
NAVAIDS>



```
    SELECTED NAVAIDS
 VOR/DME  AUTO  DESELECT
<GEN     115.20      [   ]*
 VOR/DME
<NIZ     115.10
 VOR/DME
<TOP     115.40
 ILS/DME
<NA      110.70
  RADIONAV SELECTED
←DESELECT
  GPS SELECTED
←DESELECT           RETURN>
 TOU
```

① WRITE

ENTER ②

```
    SELECTED NAVAIDS
 VOR/DME  AUTO  DESELECT
<GEN     115.20         TOU
 VOR/DME
<NIZ     115.10      [   ]*
 VOR/DME
<TOP     115.40
 ILS/DME
<NA      110.70
  RADIONAV SELECTED
←DESELECT
  GPS SELECTED
←DESELECT           RETURN>
```

TOU IS DESELECTED

Note: *When a NAVAID is deselected, it is no more used for navigation by the FMGEC during the rest of the flight. However a deselected NAVAID can still be manually tuned on the RAD NAV page and displayed on ND.*

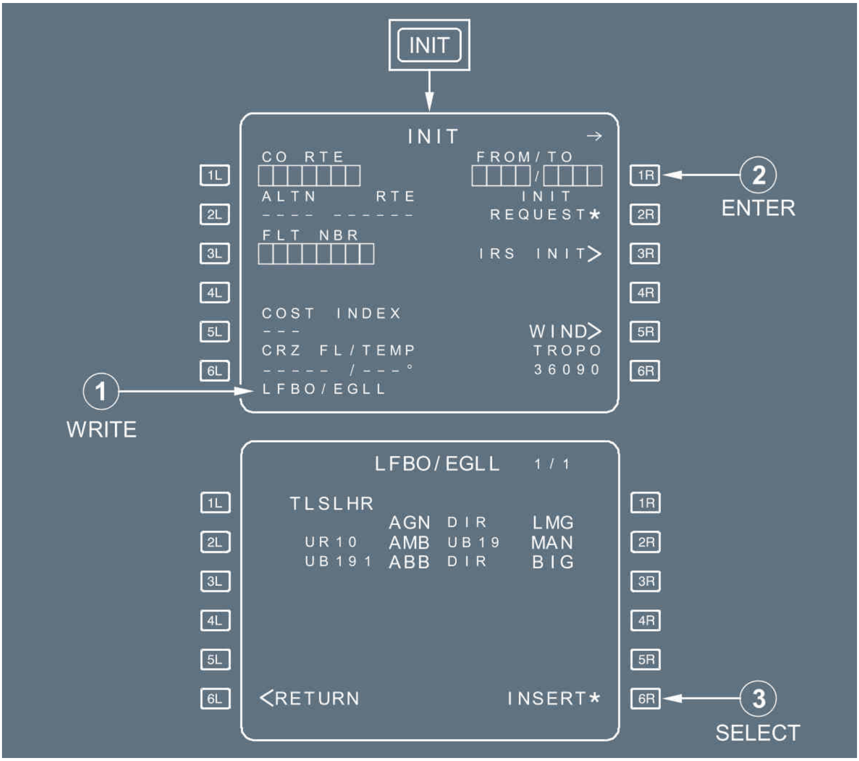
FLIGHT PLAN INITIALIZATION

Ident.: PRO-NOR-SRP-01-10-A-00002451.0004001 / 09 OCT 12
Applicable to: ALL

GENERAL

Follow SOP instructions, when the route is a company route stored in the database.

- **If the company route is unknown, proceed as follows:**


INIT
INIT →
CO RTE
FROM/TO
ALTN RTE
INIT
REQUEST*
FLT NBR
IRS INIT>
COST INDEX
WIND>
CRZ FL/TEMP
TROPO
36090
LFBO/EGLL
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
1
WRITE
2
ENTER
LFBO/EGLL 1/1
TLSLHR
AGN DIR LMG
UR10 AMB UB19 MAN
UB191 ABB DIR BIG
<RETURN
INSERT*
3
SELECT

WRITE a “FROM/TO” city pair, then ENTER it:

If one or more company routes run between the cities, the ROUTE SELECTION page appears and defines them.

INSERT the preferred company route.

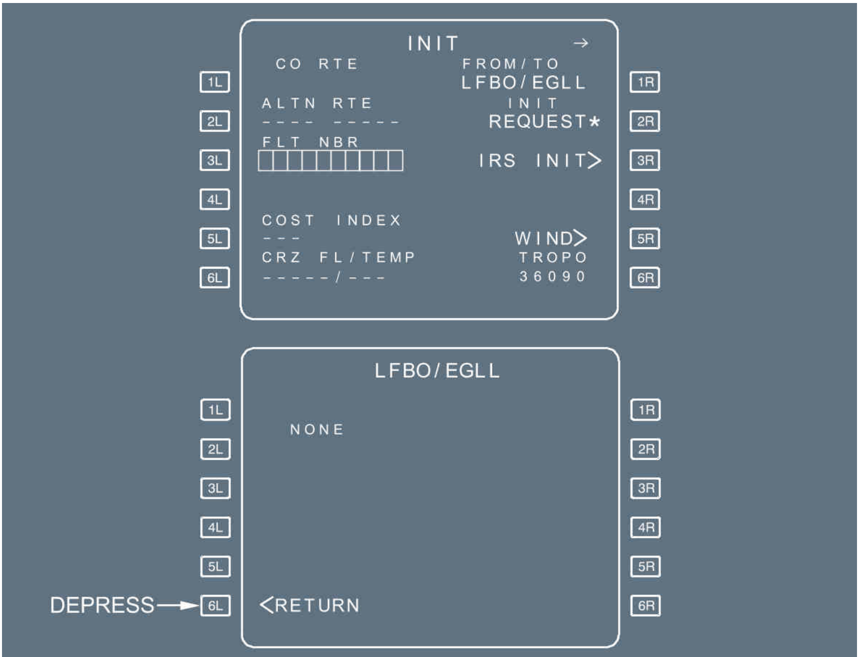
- **If the database does not contain a company route:**
  The flight plan will be constructed manually:

  PRESS the INIT key.

  ENTER a city pair in the FROM/TO field.

  The ROUTE SELECTION page comes up with “NONE”.

  SELECT RETURN [6L] key, then construct the flight plan manually.



INIT →
CO RTE FROM/TO
LFBO/EGLL
ALTN RTE INIT
---- ----- REQUEST*
FLT NBR
☐☐☐☐☐☐☐☐☐☐ IRS INIT>
COST INDEX
--- WIND>
CRZ FL/TEMP TROPO
-----/--- 36090

LFBO/EGLL
NONE
<RETURN

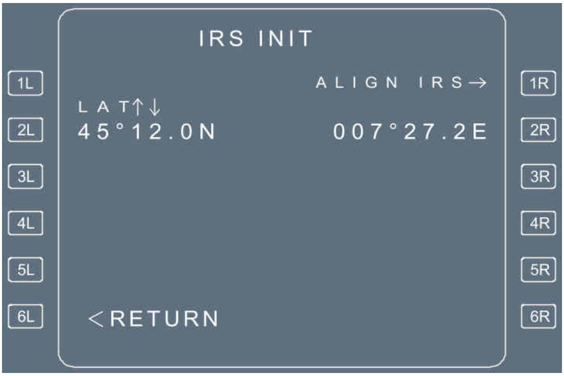
ROUTE SELECTION

If waypoints, NAVAIDs or airports are not in the NAV database, the pilot must define and store them manually, using the data “stored” function.

Ident.: PRO-NOR-SRP-01-10-A-00002452.0002001 / 07 FEB 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

ALIGNING IRS

- The pilot can enter the latitude with N or S preceding or following the value (for example, N4350.5 or 4350.5N), and the longitude with E or W preceding or following the value (for example, E00364.5 or 364.5E, W11020.3 or 11020.3W).
  Leading zeros may be omitted.



IRS INIT

ALIGN IRS→

LAT↑↓

45°12.0N

007°27.2E

<RETURN

- If the airport reference point is modified after the completion of the alignment, the MCDU displays the “RESET IRS TO NAV” message. During a stopover, it should be considered as a reminder for a quick realignment.

- **If the “RESET IRS TO NAV” message comes up later:**
  - Check the latitude and longitude, shown on the IRS INIT page, against the position of the IRSs in NAV MODE on the IRS pages (accessed via the IRS MONITOR page).
  - If these positions differ, RESET the ADIRS CDU mode by switching the selector switches OFF, and back to NAV within 5 s. (All three IRSs must be switched OFF, and then all three switched to NAV.)

Ident.: PRO-NOR-SRP-01-10-A-00002452.0005001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

ALIGNING IRS

PRESS the INIT key, and then the IRS INIT prompt.

IRS INIT page is displayed with the airport reference point as default coordinates.

If necessary, PRESS [2L] and/or [2R] and use scroll keys to adjust the latitude and/or the longitude values.

For example, this can be used to enter the gate precise coordinates when the aircraft is intended to fly without GPS on long segments without radio coverage.

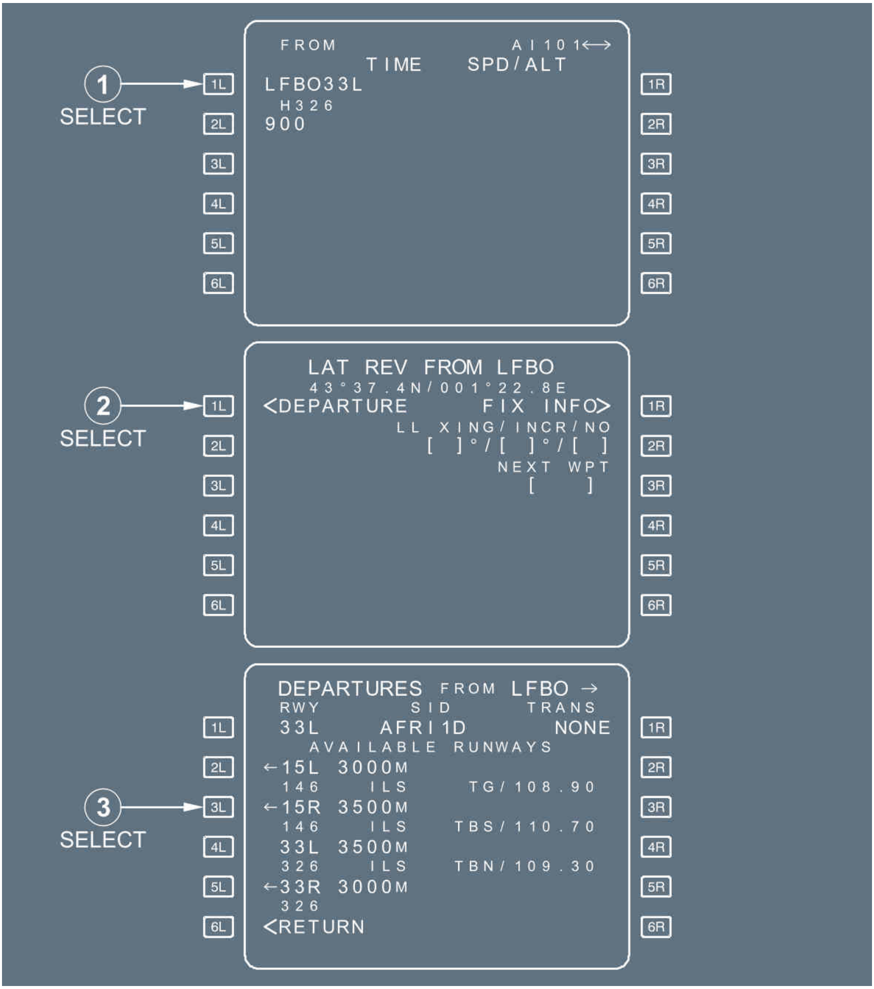
PRESS the ALIGN ON REF prompt and CONFIRM ALIGN* prompt.

The displayed coordinates are sent to ADIRS for initialization.
The alignment status changes to ALIGNING ON REF.

Ident.: PRO-NOR-SRP-01-10-A-00002453.0001001 / 09 OCT 12
Applicable to: ALL

LATERAL FLIGHT PLAN

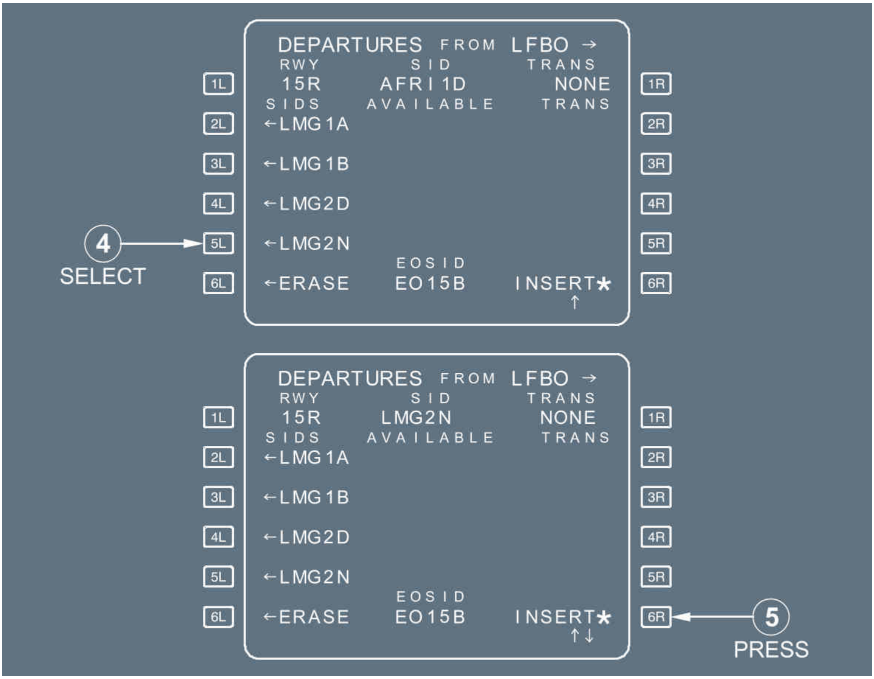
SELECTING A DEPARTURE



```
 FROM                AI101←→
         TIME      SPD/ALT
LFBO33L
 H326
900
```

```
    LAT REV FROM LFBO
    43°37.4N/001°22.8E
<DEPARTURE       FIX INFO>
           LL XING/INCR/NO
       [  ]°/[  ]°/[  ]
                 NEXT WPT
                  [    ]
```

```
 DEPARTURES FROM LFBO →
 RWY        SID       TRANS
 33L      AFRI1D       NONE
    AVAILABLE RUNWAYS
←15L  3000M
 146     ILS      TG/108.90
←15R  3500M
 146     ILS     TBS/110.70
 33L  3500M
 326     ILS     TBN/109.30
←33R  3000M
 326
<RETURN
```



```
DEPARTURES FROM LFBO →
RWY          SID        TRANS
15R       AFRI 1D        NONE
SIDS     AVAILABLE      TRANS
←LMG1A

←LMG1B

←LMG2D

←LMG2N
            EOSID
←ERASE      EO15B     INSERT*
                          ↑
```

```
DEPARTURES FROM LFBO →
RWY          SID        TRANS
15R        LMG2N         NONE
SIDS     AVAILABLE      TRANS
←LMG1A

←LMG1B

←LMG2D

←LMG2N
            EOSID
←ERASE      EO15B     INSERT*
                         ↑↓
```

You may use the "←" or "→" keys to gain access to the listings of runways, SIDs, and transitions.

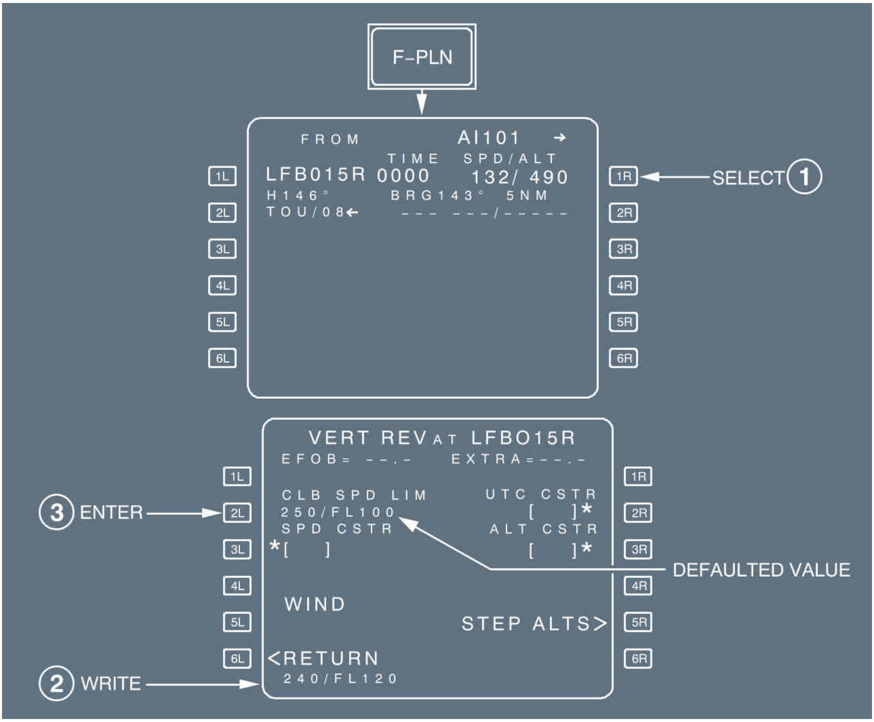
Procedure

PRESS the F-PLN key on MCDU
SELECT the DEPARTURE prompt [1L] key
SELECT the RWY in USE, SID and TRANS
CHECK the resulting temporary F-PLN
If it is correct, INSERT it using [6R] key.
If it is not correct, ERASE it using [6L] key.

Ident.: PRO-NOR-SRP-01-10-A-00002454.0003001 / 16 MAY 12
Applicable to: ALL

VERTICAL FLIGHT PLAN

ENTERING/MODIFYING A SPEED LIMIT

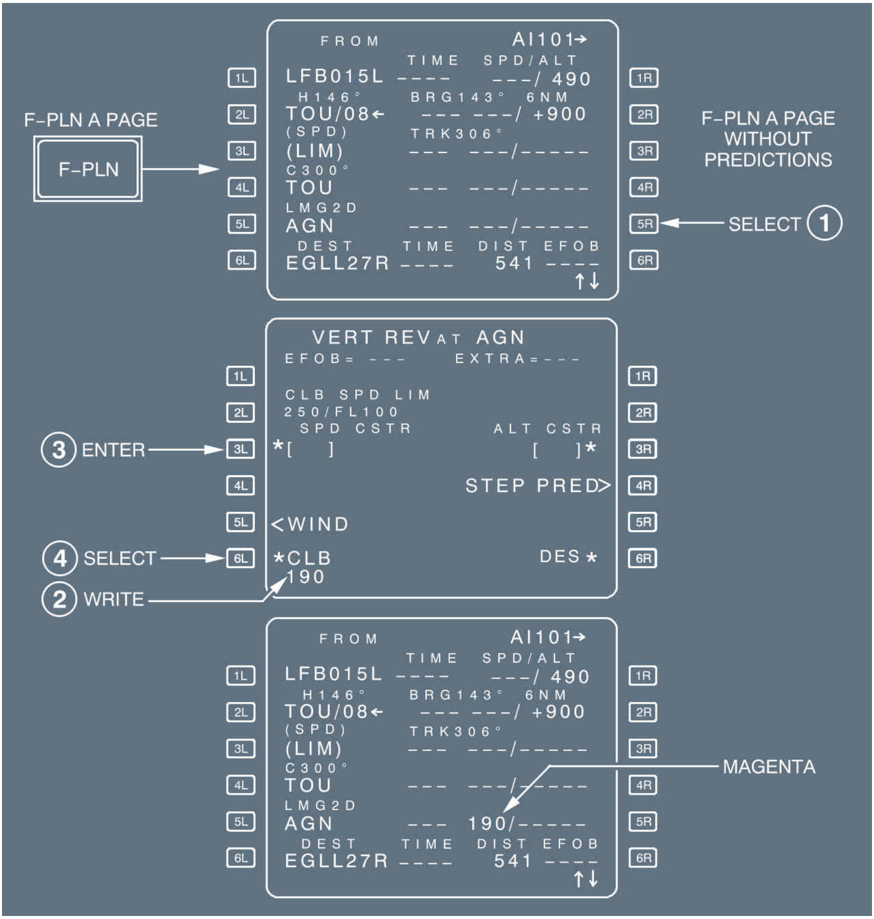

F-PLN
FROM AI101 →
TIME SPD/ALT
LFBO15R 0000 132/ 490
H146° BRG143° 5NM
TOU/08← --- ---/-----
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
SELECT 1
VERT REV AT LFBO15R
EFOB= --.- EXTRA=--.-
CLB SPD LIM UTC CSTR
250/FL100 [ ]*
SPD CSTR ALT CSTR
[ ] [ ]
WIND
STEP ALTS>
<RETURN
240/FL120
3 ENTER
2 WRITE
DEFAULTED VALUE

PRESS the F-PLN key on the MCDU.
SELECT the VERTICAL REVISION at FROM waypoint.
WRITE a new speed limit/altitude and ENTER.

The pilot can insert one climb speed limit and one descent speed limit into the vertical flight plan, or modify or clear the limits that are already in it.
The speed limit is defined by a speed and an altitude (for example, 230/9 000), which means that the managed speed target will be limited by the speed limit when the aircraft flies below the specified altitude. 250 kt at 10 000 ft is the default speed limit in the vertical flight plan in both climb and descent. The vertical revision page presents the climb speed (CLB SPD) limit if the revised waypoint belongs to a SID or is between departure and top of climb.

The vertical revision page shows the descent speed (DES SPD) limit, if the revised waypoint belongs to a standard terminal arrival route (STAR) or is between top of descent and destination.
It can be deleted by a clear action, the field reverts to brackets. It can also be cleared directly on the F-PLN A page by clearing the SPD LIM pseudo-waypoint.

ENTERING A SPEED CONSTRAINT


F-PLN A PAGE
F-PLN
F-PLN A PAGE WITHOUT PREDICTIONS
SELECT 1
3 ENTER
4 SELECT
2 WRITE
MAGENTA
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
      FROM              AI101→
             TIME    SPD/ALT
LFB015L  ----       ---/ 490
  H146°      BRG143°   6NM
TOU/08←      ---  ---/ +900
(SPD)        TRK306°
(LIM)        ---  ---/-----
C300°
TOU          ---  ---/-----
LMG2D
AGN          ---  ---/-----
  DEST    TIME    DIST  EFOB
EGLL27R  ----     541   ----
                          ↑↓
```

```
  VERT REV AT AGN
EFOB= ---        EXTRA=---

CLB SPD LIM
250/FL100
 SPD CSTR              ALT CSTR
*[    ]                 [    ]*
                     STEP PRED>

<WIND
*CLB                       DES*
 190
```

```
      FROM              AI101→
             TIME    SPD/ALT
LFB015L  ----       ---/ 490
  H146°      BRG143°   6NM
TOU/08←      ---  ---/ +900
(SPD)        TRK306°
(LIM)        ---  ---/-----
C300°
TOU          ---  ---/-----
LMG2D
AGN          ---  190/-----
  DEST    TIME    DIST  EFOB
EGLL27R  ----     541   ----
                          ↑↓
```

<u>Procedure</u>

PRESS the F-PLN key on the MCDU

SELECT the VERT REV page at revised waypoint.
WRITE the speed constraint value into the scratchpad and ENTER it in 3L.
INSERT the constraint using the appropriate *CLB or DES* prompt when displayed. If CLB and DES are not displayed, insertion occurs when the value is entered in 3L.

The system displays the climb (CLB) or the descent (DES) prompt at [6L] or [6R] when the predictions are not yet available or when the waypoint is part of the cruise phase as originally defined.
When predictions are not yet available, the constraints are displayed on the F-PLN A page in magenta.

When predictions are available, the speed constraint is highlighted by a star (*).
 * If the predicted speed matches the constraint, the star is magenta.
 * If the prediction is that the aircraft will miss the speed constraint, the star is amber.
 If a speed constraint cannot be met (by more than 10 kt), the FMGES generates the message “SPD ERROR AT WPT XX”.

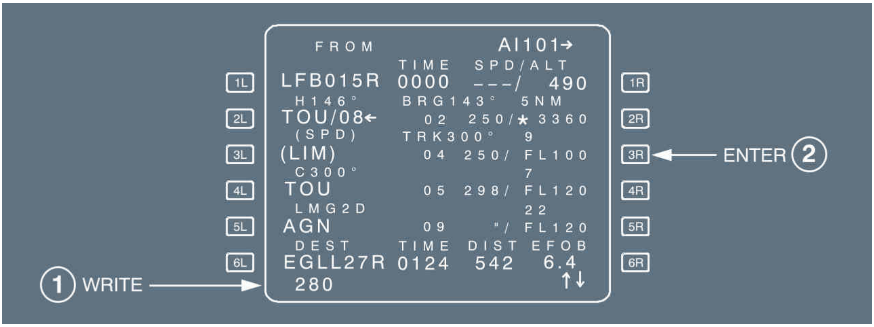
The pilot or the database may asign a speed constraint to any waypoint in the climb or the descent phase except the FROM, origin, or destination waypoints, and any pseudo waypoints.

When a speed constraint is assigned to a waypoint, the constraint will limit the managed speed target as follows:

- In takeoff or climb phase until you pass the constrained waypoint.
- In descent an approach phase, after passing the constrained waypoint.
  Speed constraints are observed by the FMGES when NAV mode and speed managed are active.

ENTERING A SPEED CONSTRAINT THROUGH F-PLN A PAGE

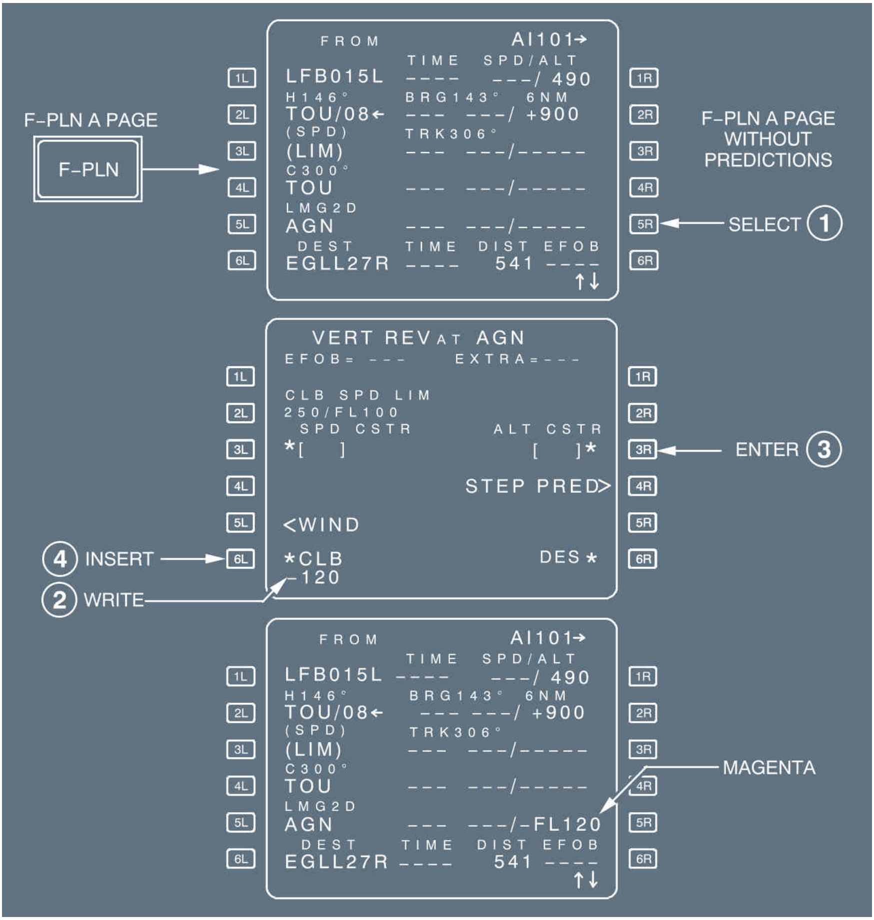
You may also enter a speed constraint through the F-PLN A page.



```
     FROM                         AI101→
              TIME    SPD/ALT
LFB015R      0000    ---/     490
   H146°      BRG143°    5NM
TOU/08←         02   250/*3360
   (SPD)      TRK300°    9
(LIM)           04   250/ FL100
   C300°                 7
TOU             05   298/ FL120
   LMG2D                 22
AGN             09     "/ FL120
   DEST       TIME   DIST  EFOB
EGLL27R      0124    542    6.4
   280                       ↑↓
```

Use the CLR key to delete them directly from the flight plan page, as well. However if there is also an altitude constraint assigned at that point, the clear action deletes it too.

ENTERING AN ALTITUDE CONSTRAINT


F-PLN A PAGE
F-PLN
FROM AI101→
TIME SPD/ALT
LFB015L ---- ---/ 490
H146° BRG143° 6NM
TOU/08← --- ---/ +900
(SPD) TRK306°
(LIM) --- ---/-----
C300°
TOU --- ---/-----
LMG2D
AGN --- ---/-----
DEST TIME DIST EFOB
EGLL27R ---- 541 ----
↑↓
F-PLN A PAGE WITHOUT PREDICTIONS
SELECT ①
VERT REV AT AGN
EFOB= --- EXTRA=---
CLB SPD LIM
250/FL100
SPD CSTR ALT CSTR
[ ] [ ]
STEP PRED>
<WIND
CLB DES
-120
ENTER ③
④ INSERT
② WRITE
FROM AI101→
TIME SPD/ALT
LFB015L ---- ---/ 490
H146° BRG143° 6NM
TOU/08← --- ---/ +900
(SPD) TRK306°
(LIM) --- ---/-----
C300°
TOU --- ---/-----
LMG2D
AGN --- ---/-FL120
DEST TIME DIST EFOB
EGLL27R ---- 541 ----
↑↓
MAGENTA
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Procedure

PRESS the F-PLN key on the MCDU.
SELECT the "VERT REV" page at the revised waypoint.
WRITE an altitude constraint in the scratchpad and ENTER it in 3R.

INSERT the constraint using the *CLB or DES* prompt, when it is displayed. Otherwise, the value is inserted when it is entered in 3R.

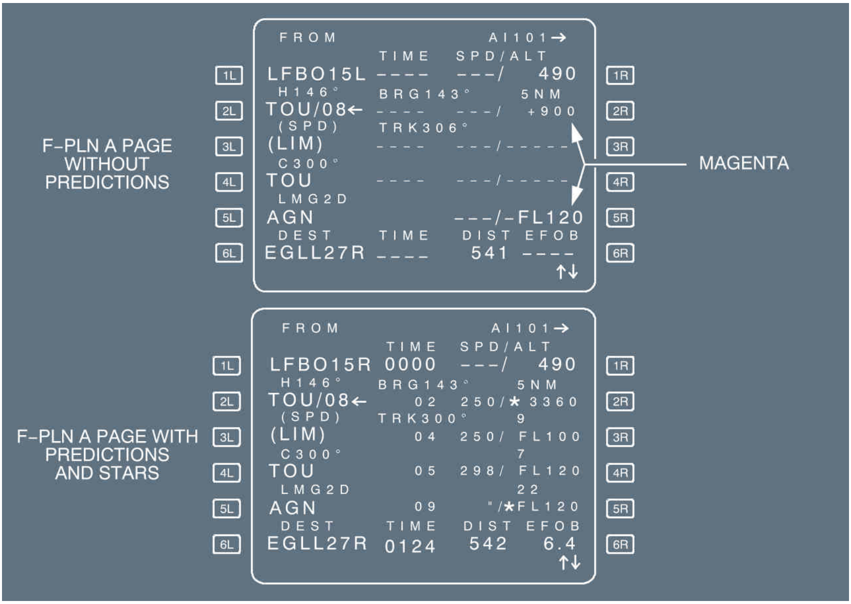
*The system displays the *CLB or DES* prompt, when the predictions are not yet available, or when the waypoint is part of the cruise phase as originally defined.*

Note: *In case of QFE operations, the height constraints must be converted and entered as an altitude in feet.*

The pilot or the database may assign an altitude constraint to any waypoint in the climb or descent phases except the FROM, origin, or destination waypoints, or any pseudo waypoint.

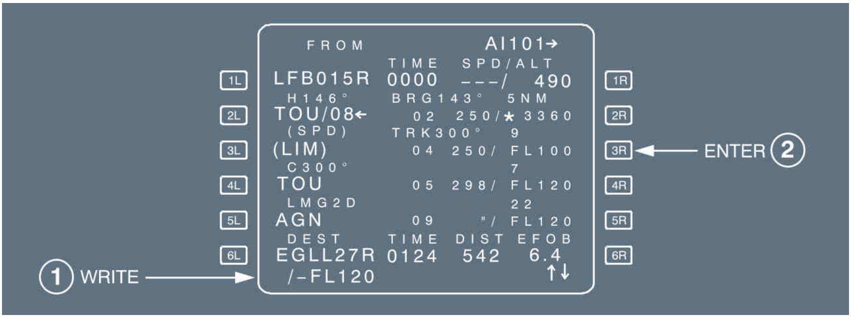
An altitude constraint may be defined as an “at”, an “at or above”, or an “at or below” constraint. In certain procedures, the database may define an altitude constraint as a window in which the aircraft should fly.

- Enter “AT” constraints with no sign.
  Enter “AT or ABOVE” constraints preceded by a + sign (FL +130, for example).
  Enter “AT or BELOW” constraints preceded by a - sign (-15 000, for example).
  Use four digits when entering altitude. Include the lead zero (0 500 ft, for example).
  For flight level, enter a two- or three-digit number, with or without the letters “FL”. The lead zero is optional. (Examples: FL +120 or +120; FL -090 or -90 or -090)
- Enter the altitude value as either altitude or flight level; the MCDU displays the selected value as an “ALT” or “FL,” as appropriate for the transition altitude.
  The constraint must be higher than the thrust reduction altitude and lower than the cruise flight level.
  Once inserted in the flight plan, the altitude constraint (ALT CSTR) is displayed in magenta as long as predictions are not available.
  When predictions are available, the altitude constraints are replaced by the predicted altitude at relevant waypoints highlighted by a star.
  * if the predicted altitude matches the constraint the star is magenta if the predicted altitude is missed (by more than 250 ft), the star is amber.


F-PLN A PAGE WITHOUT PREDICTIONS
FROM AI101→
TIME SPD/ALT
LFBO15L ---- ---/ 490
H146° BRG143° 5NM
TOU/08← ---- ---/ +900
(SPD) TRK306°
(LIM) ---- ---/-----
C300°
TOU ---- ---/-----
LMG2D
AGN ---/-FL120
DEST TIME DIST EFOB
EGLL27R ---- 541 ----
↑↓
MAGENTA
F-PLN A PAGE WITH PREDICTIONS AND STARS
FROM AI101→
TIME SPD/ALT
LFBO15R 0000 ---/ 490
H146° BRG143° 5NM
TOU/08← 02 250/★3360
(SPD) TRK300° 9
(LIM) 04 250/ FL100
C300° 7
TOU 05 298/ FL120
LMG2D 22
AGN 09 "/★FL120
DEST TIME DIST EFOB
EGLL27R 0124 542 6.4
↑↓
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

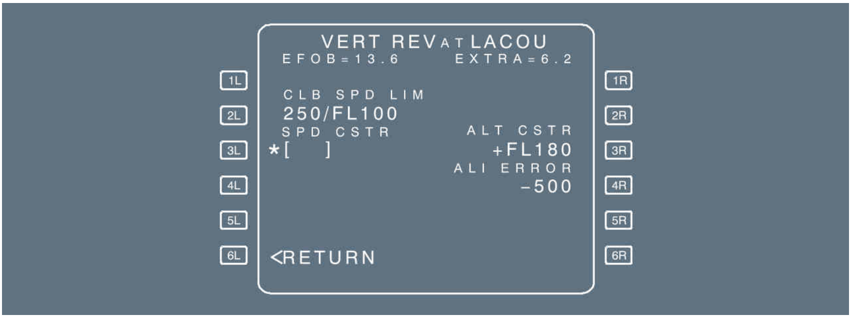
Entering an Altitude Constraint Altitude F-PLN a Page

The pilot may also enter an altitude constraint directly through the F-PLN A page.
When entering the value into the scratchpad do not forget the slash e.g. /-120 or /FL -120. If the slash is omitted the value will be considered as a speed constraint if it is within the range value.


FROM AI101→
TIME SPD/ALT
LFB015R 0000 ---/ 490
H146° BRG143° 5NM
TOU/08← 02 250/★3360
(SPD) TRK300° 9
(LIM) 04 250/ FL100
C300° 7
TOU 05 298/ FL120
LMG2D 22
AGN 09 "/ FL120
DEST TIME DIST EFOB
EGLL27R 0124 542 6.4
/-FL120 ↑↓
ENTER ②
① WRITE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Use the CLR key to delete them directly from the flight plan page, as well. However, if there is also a speed constraint assigned at that waypoint, the clear action deletes it too.

The vertical revision page displays “ALT ERROR”, value along with the difference between the constraint and the predicted altitude at the revised waypoint.

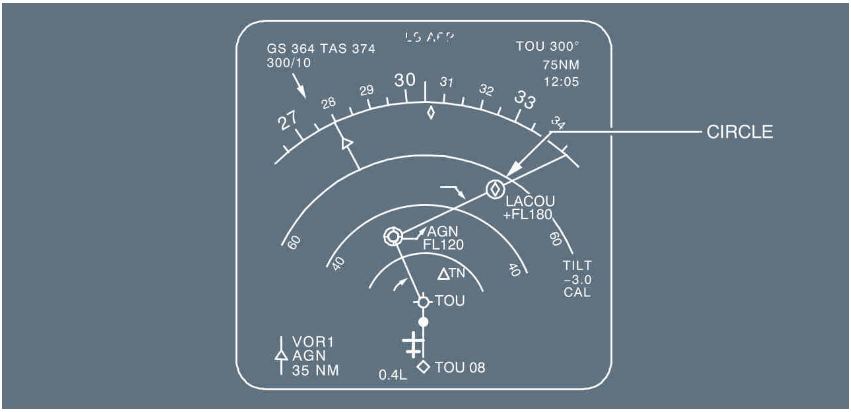


```
      VERT REV AT LACOU
 EFOB=13.6        EXTRA=6.2

 CLB SPD LIM
 250/FL100
 SPD CSTR               ALT CSTR
*[    ]                  +FL180
                      ALT ERROR
                           -500


<RETURN
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

ND Display

An altitude-constrained waypoint is marked by a circle (◯) on the navigation display.
This circle is white when the guidance does not take the altitude constraint into account.
It is magenta if the guidance system takes the altitude constraint into account and predicts that it will be matched.
It is amber if the guidance system takes the altitude constraint into account and predicts that it will not be matched.



GS 364 TAS 374
300/10
LS APP
TOU 300°
75NM
12:05
27
28
29
30
31
32
33
34
CIRCLE
LACOU
+FL180
AGN
FL120
60
40
40
60
TN
TOU
TILT
-3.0
CAL
VOR1
AGN
35 NM
0.4L
TOU 08

The aircraft should be at or below FL 120 at AGN and above FL 180 at LACOU.

ENTERING AN ESTIMATED TAKEOFF TIME (ETT)

In Preflight Phase

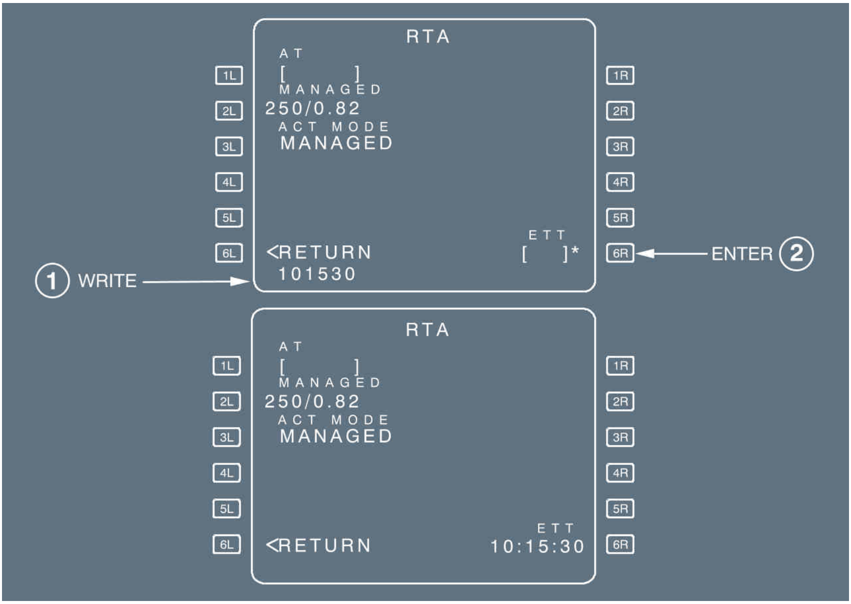
SELECT the SEC F-PLN key on the MCDU.
SELECT a VERT REV at any waypoint
SELECT the Required Time of Arrival (RTA) prompt [2R] .

The MCDU displays the RTA page.

WRITE the Estimated Takeoff Time.

The format is HHMMSS (entry of seconds is not mandatory).

ENTER it in the 6R field



```
                RTA
 AT
 [        ]
 MANAGED
250/0.82
 ACT MODE
 MANAGED



                          ETT
<RETURN                  [    ]*
 101530
```

```
                RTA
 AT
 [        ]
 MANAGED
250/0.82
 ACT MODE
 MANAGED



                          ETT
<RETURN               10:15:30
```

The display automatically reverts to the F-PLN A page.
If the aircraft has not taken off by the time entered as the estimated takeoff time, the MCDU displays the “CLK IS TAKEOFF TIME” message, meaning that the system will replace your estimated takeoff time with the actual time.
When begining the takeoff roll, the system automatically adopts that clock time as the takeoff time.
If the origin airport is changed, or the clock time is invalid, the system automatically deletes the estimated takeoff time.

Ident.: PRO-NOR-SRP-01-10-A-00002455.0001001 / 10 DEC 09
Applicable to: ALL

FLIGHT PLAN CHECK

CHECK the EOSID on the ND plan mode (yellow line).

Note: *If the details of the EOSID require review, select the EOSID as a TMPY F-PLN and review it as TMPY. Then, ERASE it.*

Ident.: PRO-NOR-SRP-01-10-A-00002456.0001001 / 10 DEC 09
Applicable to: ALL

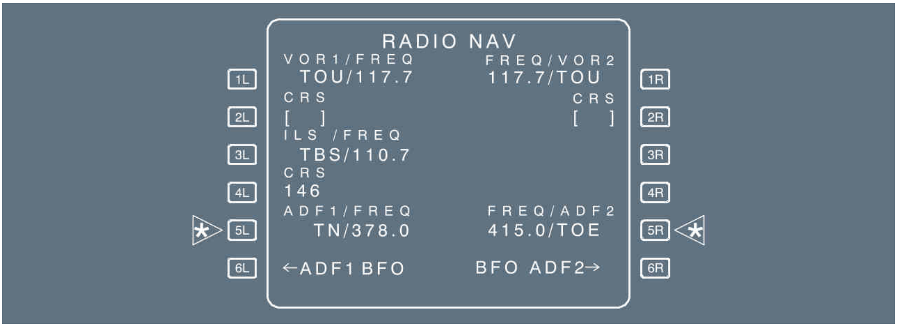
SECONDARY F-PLN

For details : *Refer to DSC-22_20-60-50 Secondary Flight Plan*

Ident.: PRO-NOR-SRP-01-10-A-00002457.0003001 / 21 MAR 16
Applicable to: ALL

RADIO NAV

Whenever a NAVAID ident is correctly decoded, in agreement with that published, no audio check is necessary.
Morse decoding is displayed on the ND for VOR/DME, VOR/TAC, DME, NDB (ADF ◁), and on the PFD for ILS/GLS ◁ .
Preferably use the identifier for NAVAID entry.
If the NDB (ADF ◁) ident is not in the database, be sure to include a decimal point when entering the frequency (e.g. 315 or 325.7).



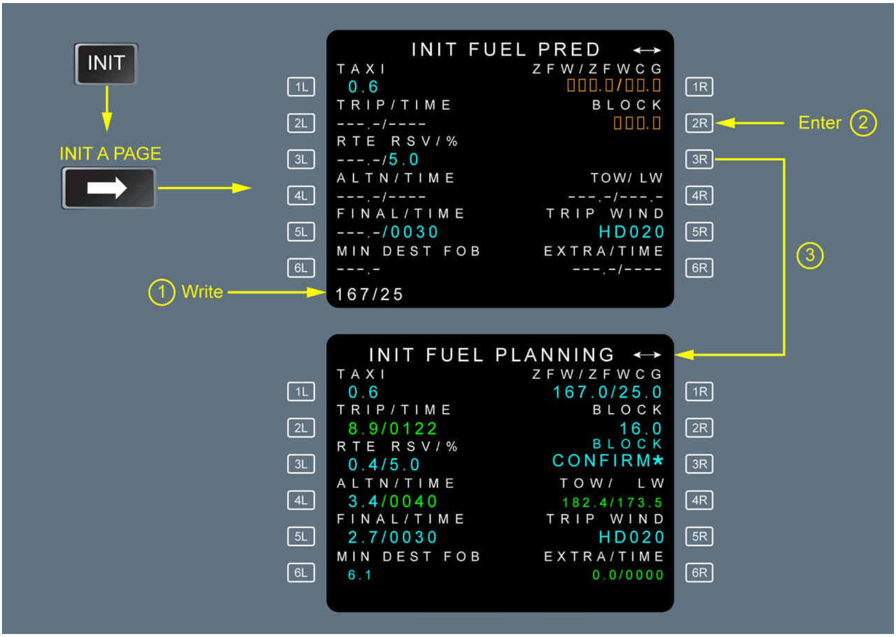
```
           RADIO NAV
VOR1/FREQ            FREQ/VOR2
 TOU/117.7           117.7/TOU
CRS                        CRS
[   ]                    [   ]
ILS /FREQ
 TBS/110.7
CRS
146
ADF1/FREQ            FREQ/ADF2
  TN/378.0           415.0/TOE
←ADF1 BFO            BFO ADF2→
```

FMGES DATA INSERTION

Ident.: PRO-NOR-SRP-01-10-B-00002458.0006001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

WEIGHT/CG INSERTION AND FUEL PLANNING

The flight crew must enter the ZFW and ZFWCG values on the INIT FUEL PRED page, to allow the FMS to perform the fuel planning computations.



```
    INIT FUEL PRED     ←→
TAXI            ZFW/ZFWCG
 0.6          □□□.□/□□.□
TRIP/TIME           BLOCK
---.-/----          □□□.□
RTE RSV/%
---.-/5.0
ALTN/TIME         TOW/ LW
---.-/----    ---.-/---.-
FINAL/TIME     TRIP  WIND
---.-/0030          HD020
MIN DEST FOB   EXTRA/TIME
---.-          ---.-/----
167/25
```

```
   INIT FUEL PLANNING  ←→
TAXI            ZFW/ZFWCG
 0.6           167.0/25.0
TRIP/TIME           BLOCK
 8.9/0122            16.0
RTE RSV/%           BLOCK
 0.4/5.0         CONFIRM*
ALTN/TIME        TOW/  LW
 3.4/0040     182.4/173.5
FINAL/TIME     TRIP  WIND
 2.7/0030           HD020
MIN DEST FOB   EXTRA/TIME
 6.1            0.0/0000
```

PROCEDURE

PRESS the INIT key, and the Next ("→") key to access the INIT FUEL PRED page.
ENTER the ZFW and ZFWCG value in the [1R] field.
The "FUEL PLANNING →" prompt appears in the [3R] field.

Note: *As long as the final Load and Trim Sheet is not available, the flight crew should insert the estimated ZFW/ZFWCG in order to get fuel estimates. The ZFW and ZFWCG values must be updated with the final Load and Trim Sheet values.*

CHECK/MODIFY the TAXI [1L], RTE RSV [3L] and FINAL TIME [5L] values.

The TAXI and RTE RSV and FINAL TIME fields display the default values specified in the AMI file (for example, "0.4 t" for TAXI, and "5.0 %" for RTE RSV and “0045” for FINAL TIME). The flight crew may modify these values.

Note: *At takeoff, the RTE RSV field will automatically be reset to 0. The RTE RSV fuel is then added to the EXTRA fuel, which ensures that the EXTRA fuel and MIN DEST FOB values are consistent in flight.*

ENTER an ALTN fuel value in the [4L] field, as necessary.

The flight crew may enter the ALTN fuel value planned on the Computerized Flight Plan (CFP), as necessary.

ENTER a MIN DEST FOB value in the [6L] field, as necessary.

Note: *MIN DEST FOB (equal to ALTN + FINAL) can be increased at flight crew discretion (e.g. when HOLD is expected at destination).*

ENTER the TRIP WIND value in the [5R] field, as necessary.

If no wind profile has been entered in the F-PLN, the flight crew may enter an average TRIP WIND in this field, to obtain more realistic fuel/time predictions before departure.

Note:

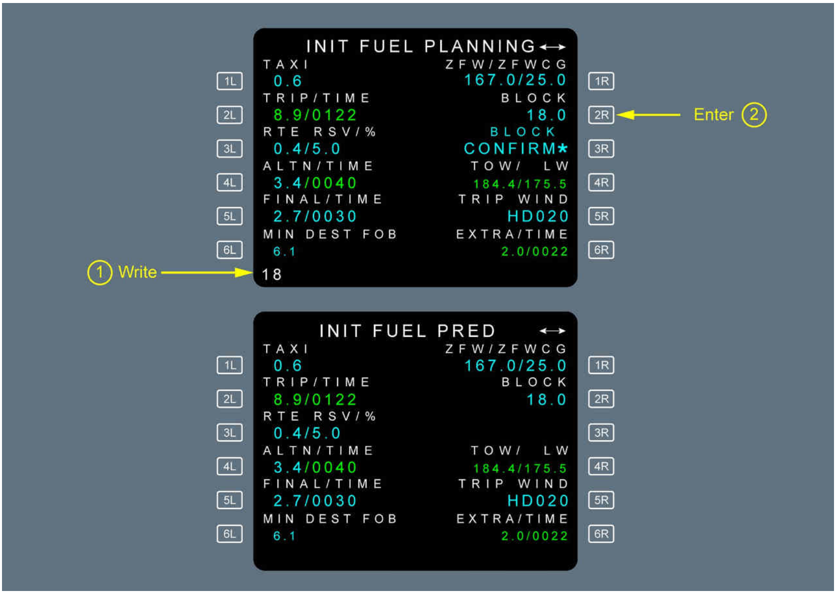
1. *The flight crew should only enter a TRIP WIND to obtain realistic fuel/time predictions, on ground. Then, the flight crew should enter a wind profile using the WIND pages, for fuel/time predictions in flight. As soon as the flight crew has entered a wind profile on the WIND pages, the TRIP WIND will be erased.*
2. *If the flight crew has already defined a wind profile, even partially (such as climb wind), it is not possible to enter a TRIP WIND.*

ENTER the planned BLOCK fuel, as indicated in the Computerized Flight Plan (CFP).

If the planned BLOCK fuel is not available, the flight crew may obtain a prediction of the minimum BLOCK fuel required for the flight by pressing the FUEL PLANNING prompt [3R].
Pressing this prompt makes the FMS compute the minimum required BLOCK fuel, which is the BLOCK fuel required to have EXTRA fuel equal to 0, based on the parameters entered on the INIT and F-PLN pages.
The computed BLOCK fuel value is displayed in the [2R] field, and a BLOCK CONFIRM prompt appears in the [3R] field.*

Note: *In order to obtain a realistic fuel computation, the flight crew should ensure that the F-PLN initialization has been completed (including insertion of the ALTN F-PLN and/or ALTN fuel, if necessary), and that flight parameters, such as CRZ FL, steps climbs (if any), and winds, have been inserted.*

- **When the final LTS data are available:**



```
         INIT FUEL PLANNING ↔
TAXI                        ZFW/ZFWCG
 0.6                       167.0/25.0
TRIP/TIME                       BLOCK
 8.9/0122                        18.0
RTE RSV/%                       BLOCK
 0.4/5.0                     CONFIRM*
ALTN/TIME                     TOW/ LW
 3.4/0040                 184.4/175.5
FINAL/TIME                  TRIP WIND
 2.7/0030                       HD020
MIN DEST FOB               EXTRA/TIME
 6.1                        2.0/0022
18
```

```
           INIT FUEL PRED   ↔
TAXI                        ZFW/ZFWCG
 0.6                       167.0/25.0
TRIP/TIME                       BLOCK
 8.9/0122                        18.0
RTE RSV/%
 0.4/5.0
ALTN/TIME                     TOW/ LW
 3.4/0040                 184.4/175.5
FINAL/TIME                  TRIP WIND
 2.7/0030                       HD020
MIN DEST FOB               EXTRA/TIME
 6.1                        2.0/0022
```

ENTER the final ZFW/ZFWCG [1R], and the required BLOCK fuel [2R].

The FMGEC computes the predictions, based on the entered BLOCK fuel, and estimates the EXTRA fuel value.

CHECK the resulting computed data, against the data planned on the CFP: TRIP fuel, RTE RSV fuel, ALTN fuel, FINAL and EXTRA fuel values.

If necessary, the flight crew may modify the ALTN or FINAL fuel values.

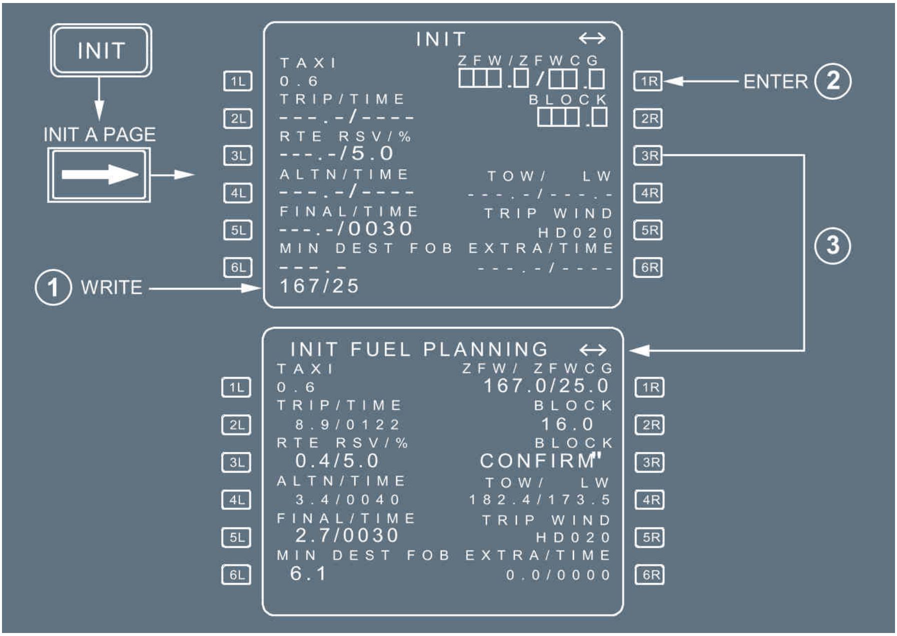
PRINT the PREFLIGHT REPORT, if necessary.

When the final Load and Trim Sheet values (ZFW/ZFWCG/BLOCK) have been entered, the flight crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00002458.0005001 / 05 OCT 16
Applicable to: LV-KHT, LV-KHU

WEIGHT/CG INSERTION AND FUEL PLANNING

The flight crew must enter the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values on the INIT B page, to allow the FMS to perform the fuel planning computations.



```
INIT                      ↔
TAXI               ZFW/ZFWCG
0.6              □□□.□/□□.□
TRIP/TIME              BLOCK
---.-/----             □□□.□
RTE RSV/%
---.-/5.0
ALTN/TIME           TOW/  LW
---.-/----       ---.-/---.-
FINAL/TIME         TRIP WIND
---.-/0030             HD020
MIN DEST FOB      EXTRA/TIME
---.-             ---.-/----
167/25
```

```
INIT FUEL PLANNING        ↔
TAXI              ZFW/ ZFWCG
0.6               167.0/25.0
TRIP/TIME              BLOCK
 8.9/0122               16.0
RTE RSV/%              BLOCK
 0.4/5.0            CONFIRM*
ALTN/TIME            TOW/  LW
 3.4/0040        182.4/173.5
FINAL/TIME         TRIP WIND
 2.7/0030              HD020
MIN DEST FOB      EXTRA/TIME
 6.1                0.0/0000
```

PROCEDURE

PRESS the INIT key, and the Next ("→") key to access the INIT B page.

ENTER the ZFW and ZFWCG value in the [1R] field.

The "FUEL PLANNING →" prompt appears in the [3R] field.

Note: As long as the final Load and Trim Sheet is not available, the flight crew should insert the estimated ZFW/ZFWCG in order to get fuel estimates. The ZFW and ZFWCG values must be updated with the final Load and Trim Sheet values.

CHECK/MODIFY the TAXI [1L], RTE RSV [3L] and FINAL TIME [5L] values.

The TAXI and RTE RSV and FINAL TIME fields display the default values specified in the AMI file (for example, "0.4 t" for TAXI, and "5.0 %" for RTE RSV and "0045" for FINAL TIME). The flight crew may modify these values.

Note: At takeoff, the RTE RSV field will automatically be reset to 0. The RTE RSV fuel is then added to the EXTRA fuel, which ensures that the EXTRA fuel and MIN DEST FOB values are consistent in flight.

ENTER an ALTN fuel value in the [4L] field, as necessary.

The flight crew may enter the ALTN fuel value planned on the Computerized Flight Plan (CFP), as necessary.

ENTER a MIN DEST FOB value in the [6] field, as necessary.

Note: *MIN DEST FOB (equal to ALTN + FINAL) can be increased at flight crew discretion (e.g. when HOLD is expected at destination).*

ENTER the TRIP WIND value in the [5R] field, as necessary.

If no wind profile has been entered in the F-PLN, the flight crew may enter an average TRIP WIND in this field, to obtain more realistic fuel/time predictions before departure.

Note:

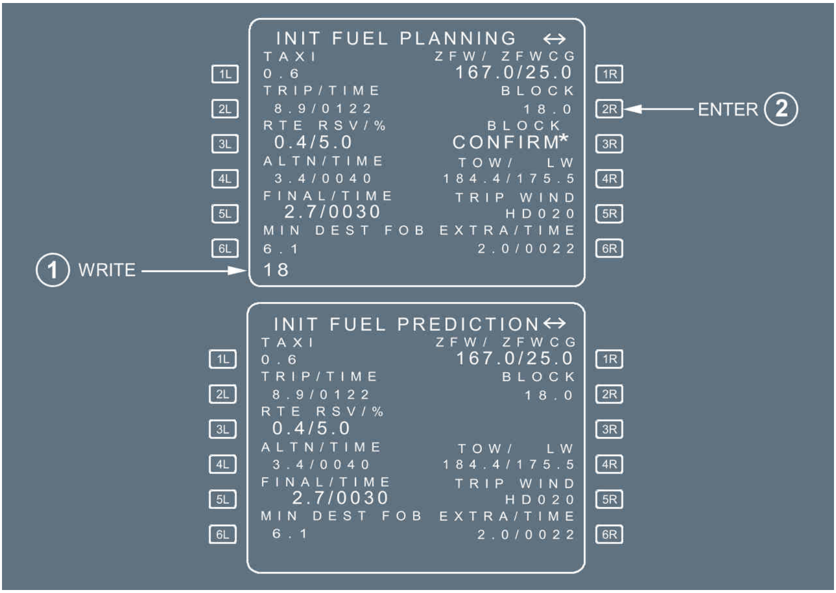
1. *The flight crew should only enter a TRIP WIND to obtain realistic fuel/time predictions, on ground. Then, the flight crew should enter a wind profile using the WIND pages, for fuel/time predictions in flight. As soon as the flight crew has entered a wind profile on the WIND pages, the TRIP WIND will be erased.*
2. *If the flight crew has already defined a wind profile, even partially (such as climb wind), it is not possible to enter a TRIP WIND.*

ENTER the planned BLOCK fuel, as indicated in the Computerized Flight Plan (CFP).

If the planned BLOCK fuel is not available, the flight crew may obtain a prediction of the minimum BLOCK fuel required for the flight by pressing the FUEL PLANNING prompt [3R]. Pressing this prompt makes the FMS compute the minimum required BLOCK fuel, which is the BLOCK fuel required to have EXTRA fuel = 0, based on the parameters entered on the INIT and F-PLN pages.
The computed BLOCK fuel value is displayed in the [2R] field, and a BLOCK CONFIRM prompt appears in the [3R] field.

Note: *In order to obtain a realistic fuel computation, the flight crew should ensure that the F-PLN initialization has been completed (including insertion of the ALTN F-PLN and/or ALTN fuel, if necessary), and that flight parameters, such as CRZ FL, steps climbs (if any), and winds, have been inserted.*

- **When the final Load and Trim Sheet (LTS) data are available:**



```
INIT FUEL PLANNING      ↔
TAXI            ZFW/ ZFWCG
0.6             167.0/25.0
TRIP/TIME            BLOCK
8.9/0122              18.0
RTE RSV/%            BLOCK
0.4/5.0           CONFIRM*
ALTN/TIME         TOW/  LW
3.4/0040       184.4/175.5
FINAL/TIME       TRIP WIND
2.7/0030             HD020
MIN DEST FOB    EXTRA/TIME
6.1               2.0/0022
18
```

```
INIT FUEL PREDICTION    ↔
TAXI            ZFW/ ZFWCG
0.6             167.0/25.0
TRIP/TIME            BLOCK
8.9/0122              18.0
RTE RSV/%
0.4/5.0
ALTN/TIME         TOW/  LW
3.4/0040       184.4/175.5
FINAL/TIME       TRIP WIND
2.7/0030             HD020
MIN DEST FOB    EXTRA/TIME
6.1               2.0/0022
```

ENTER the final ZFW/ZFWCG [1R], and the required BLOCK fuel [2R].

The FMGEC computes the predictions, based on the entered BLOCK fuel, and estimates the EXTRA fuel value.

CHECK the resulting computed data, against the data planned on the CFP: TRIP fuel, RTE RSV fuel, ALTN fuel, FINAL and EXTRA fuel values.

If necessary, the flight crew may modify the ALTN or FINAL fuel values.

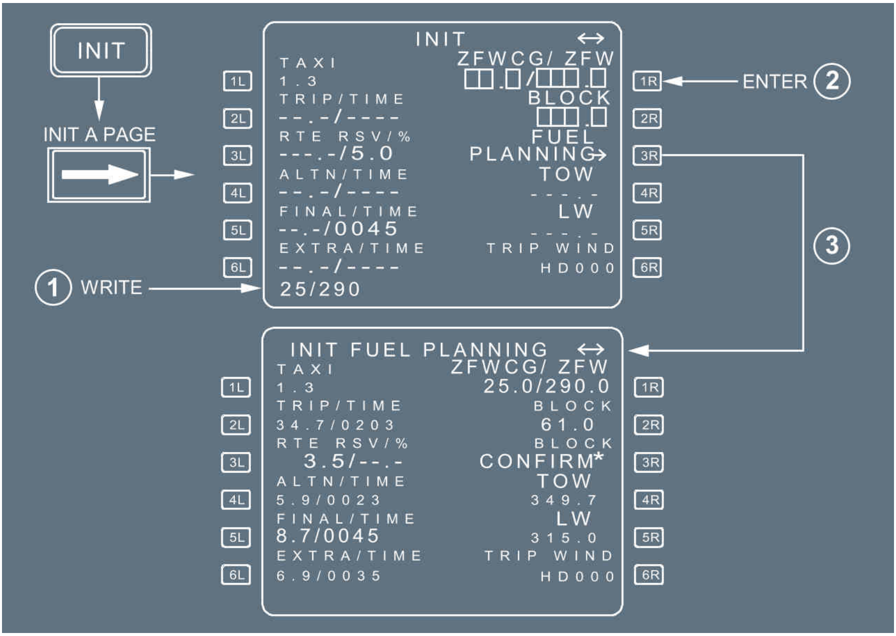
PRINT the PREFLIGHT REPORT, if necessary.

When the final Load and Trim Sheet values (ZFW/ZFWCG/BLOCK) have been entered, the flight crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00002458.0002001 / 05 OCT 16
Applicable to: LV-GKO, LV-GKP

WEIGHT/CG INSERTION AND FUEL PLANNING

The flight crew must enter the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values on the INIT B page, to allow the FMS to perform the fuel planning computations.



```
              INIT      ↔
TAXI             ZFWCG/ ZFW
1.3            □□.□/□□□.□
TRIP/TIME             BLOCK
--.-/----             □□□.□
RTE RSV/%              FUEL
---.-/5.0         PLANNING→
ALTN/TIME               TOW
--.-/----             ---.-
FINAL/TIME               LW
--.-/0045             ---.-
EXTRA/TIME        TRIP WIND
--.-/----             HD000
25/290
```

```
  INIT FUEL PLANNING    ↔
TAXI             ZFWCG/ ZFW
1.3              25.0/290.0
TRIP/TIME             BLOCK
34.7/0203              61.0
RTE RSV/%             BLOCK
  3.5/--.-         CONFIRM*
ALTN/TIME               TOW
5.9/0023              349.7
FINAL/TIME               LW
8.7/0045              315.0
EXTRA/TIME        TRIP WIND
6.9/0035              HD000
```

PROCEDURE

PRESS the INIT key, and the Next ("→") key to access the INIT B page.

ENTER the ZFWCG and ZFW value in the [1R] field.

The "FUEL PLANNING →" prompt appears in the [3R] field.

Note: *As long as the final loadsheet is not available, the flight crew should insert the estimated ZFWCG/ZFW in order to get fuel estimates. The ZFWCG and ZFW values must be updated with the final loadsheet values.*

CHECK/MODIFY the TAXI [1L] and RTE RSV [3L] values.

The TAXI and RTE RSV fields display the default values specified in the AMI file (for example, "0.4 t" for TAXI, and "5.0 %" for RTE RSV). The flight crew may modify these values.

CHECK/MODIFY the TRIP WIND value in the [6R] field.

If no wind profile has been entered in the F-PLN, the flight crew may enter an average TRIP WIND in this field, to have more realistic fuel/time predictions.

Note: *1. If the flight crew has already defined a wind profile, even partially (such as climb wind), it is not possible to enter a TRIP WIND.*
2. If the flight crew enters a TRIP WIND, and subsequently enters a wind profile on the WIND pages, the TRIP WIND will be deleted, and the FMS will use the wind profile defined on the WIND pages for predictions computations.

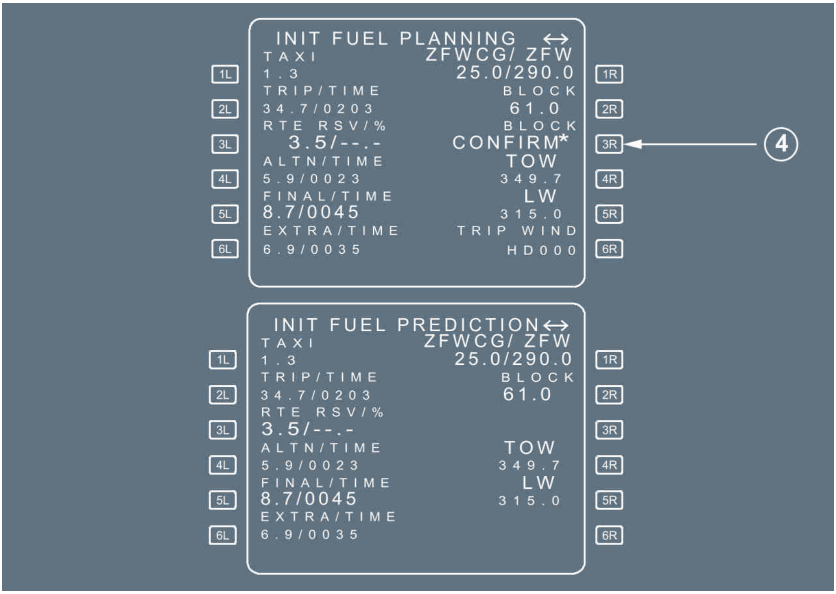
PRESS the FUEL PLANNING prompt [3R].

The FMS computes the required BLOCK fuel in order to have EXTRA fuel = 0, based on the parameters entered on the INIT and F-PLN pages. The computed BLOCK fuel value is displayed in the [2R] field, and a BLOCK CONFIRM prompt appears in the [3R] field.

Note: *In order to obtain a realistic BLOCK fuel computation, the flight crew should ensure that the F-PLN initialization has been completed (including ALTN if necessary), and that flight parameters, such as CRZ FL, steps climbs (if any), and winds, have been inserted, before using the FUEL PLANNING function.*

The flight crew must check the FMS-computed BLOCK fuel value against the actual block fuel required for the flight. Fuel planning must not be based only on FMS predictions.

- **If the computed BLOCK fuel corresponds to the actual block fuel required for the flight:**



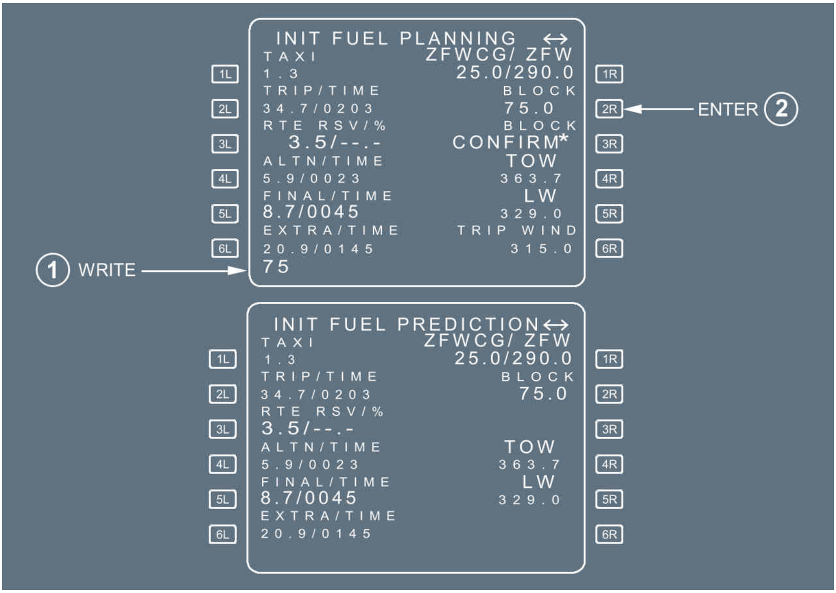
```
 INIT FUEL PLANNING    ↔
TAXI            ZFWCG/ ZFW
1.3             25.0/290.0
TRIP/TIME            BLOCK
34.7/0203             61.0
RTE RSV/%            BLOCK
 3.5/--.-          CONFIRM*
ALTN/TIME              TOW
5.9/0023             349.7
FINAL/TIME              LW
8.7/0045             315.0
EXTRA/TIME       TRIP WIND
6.9/0035             HD000
```

```
 INIT FUEL PREDICTION↔
TAXI            ZFWCG/ ZFW
1.3             25.0/290.0
TRIP/TIME            BLOCK
34.7/0203          61.0
RTE RSV/%
3.5/--.-
ALTN/TIME              TOW
5.9/0023             349.7
FINAL/TIME              LW
8.7/0045             315.0
EXTRA/TIME
6.9/0035
```

PRESS the BLOCK CONFIRM prompt [3R].

The FMS computes all the predictions, based on the computed BLOCK fuel.

- **If the computed BLOCK fuel does NOT correspond to the actual block fuel required for the flight:**



```
INIT FUEL PLANNING     ↔
TAXI          ZFWCG/ ZFW
1.3           25.0/290.0
TRIP/TIME          BLOCK
34.7/0203           75.0
RTE RSV/%          BLOCK
3.5/--.-        CONFIRM*
ALTN/TIME            TOW
5.9/0023           363.7
FINAL/TIME            LW
8.7/0045           329.0
EXTRA/TIME     TRIP WIND
20.9/0145          315.0
75
```

```
INIT FUEL PREDICTION   ↔
TAXI          ZFWCG/ ZFW
1.3           25.0/290.0
TRIP/TIME          BLOCK
34.7/0203           75.0
RTE RSV/%
3.5/--.-
ALTN/TIME            TOW
5.9/0023           363.7
FINAL/TIME            LW
8.7/0045           329.0
EXTRA/TIME
20.9/0145
```

ENTER the desired BLOCK fuel in the [2R] field.

The FMS computes the predictions, based on the entered BLOCK fuel, and estimates the EXTRA fuel value.

- **When the BLOCK fuel has been entered:**

CHECK/MODIFY the FINAL/TIME [5L] values.

If the flight crew modifies the FINAL or TIME values, the EXTRA fuel value will be modified accordingly.

Note:
- *The ALTN value computed by the FMS may differ from the value retained on the operational flight plan, since some computation hypothesis (such as, for example, the route, wind profile, CRZ FL, CI) may differ.*
- *The system computes part of the characteristics speeds displayed on the PFD (VLS, F, S, Green Dot) from the ZFWCG and ZFW entered by the flight crew on the MCDU (used by the fuel computer FCMC to compute the aircraft GW and CG). Therefore, the flight crew must carefully check these data.*

PRINT the PREFLIGHT REPORT, if necessary

When the final loadsheet values (ZFWCG/ZFW/BLOCK) have been entered, and the FUEL PLANNING is completed, the flight crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00002459.0001001 / 16 NOV 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

TAKEOFF WITH NO GROSS WEIGHT ENTRY - GROSS WEIGHT LOST BY THE FMGES

If a GW is not entered, or if the FMGES loses the value due to a power interruption, managed speed will be only available for the takeoff phase (and providing V2 has been inserted).
After engine start, the MCDU displays “INITIALIZE WEIGHTS”.

If the pilot does not respond, the following occurs :
- At takeoff, the speed reference system (SRS) mode remains active until the aircraft reaches the acceleration altitude (ACC ALT), or engages another vertical mode .
- When the aircraft leaves the SRS mode, the target speed becomes the current speed and is no longer managed.

● **To regain a normal speed target, the pilot must :**

SELECT the appropriate climb speed on the FCU and PULL the knob.

INSERT GW on the FUEL PRED page.

PUSH the SPD selector knob on the FCU to get managed speed.

Ident.: PRO-NOR-SRP-01-10-B-00002459.0002001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

TAKEOFF WITH NO WEIGHT/CG DATA

If the crew does not enter ZFW/ZFWCG data prior takeoff, or if the FMGEC looses these values due to a power interruption, the following will occur:
- At takeoff, the Speed Reference System (SRS) mode is available (provided a V2 has been inserted).
- When the aircraft leaves the SRS mode, the target speed becomes the current speed and reverts to selected.

Note: *If the AP/FD has reverted to ALT or V/S (FPA) mode, the associated A/THR mode is SPEED. In that case, the system will probably reduce thrust, because the speed will be equal to or greater than the target speed.*

- **When appropriate, to regain FMS predictions and associated managed modes:**
  INSERT the ZFW/ZFWCG values on the FUEL PRED page.

Ident.: PRO-NOR-SRP-01-10-B-00002460.0003001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

INSERTING WEIGHT/CG DATA AFTER ENGINE START

The flight crew must enter the ZFW/ZFWCG values on INIT FUEL PRED page prior to engine start. If these data have not been entered at engine start, the MCDU displays the INITIALIZE ZFW/ZFWCG message in the scratchpad. After engine start, the flight crew should enter the ZFW/ZFWCG values on the FUEL PRED page.

PRESS the FUEL PRED key.
INSERT the ZFW/ZFWCG values in the [4R] field.

This allows predictions and performance computation.

CHECK the resulting computed data, against the data planned on the CFP: TRIP fuel, RTE RSV fuel, ALTN fuel, FINAL and EXTRA fuel values.

If necessary, the flight crew may modify the ALTN or FINAL fuel values.

PRINT the PREFLIGHT REPORT, if necessary.

When the final load sheet values (ZFW/ZFWCG/BLOCK) have been entered, the flight crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00002460.0001001 / 07 FEB 11
Applicable to: LV-GKO, LV-GKP

INSERTING GW AND CG AFTER ENGINE START

The flight crew must enter the ZFWCG and ZFW on the INIT B page before engine start. After engine start, the crew can enter GW and CG values, on the FUEL PRED page.

PRESS the FUEL PRED key.
INSERT GW. This allows predictions and performance computation.
MODIFY CG, if necessary. The CG is defaulted to 25 %.

The FCMC (or the Flight Envelope part of the FMGEC as backup) continuously updates and sends gross weight and center of gravity in flight.

Ident.: PRO-NOR-SRP-01-10-B-00002460.0002001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

INSERTING WEIGHT/CG DATA AFTER ENGINE START

The flight crew must enter the ZFW/ZFWCG values on INIT B page prior to engine start. If these data have not been entered at engine start, the MCDU displays the "INITIALIZE ZFW/ZFWCG" amber message in the scratchpad. After engine start, the crew should enter the ZFW/ZFWCG values on the FUEL PRED page.

PRESS the FUEL PRED key.
INSERT the ZFW/ZFWCG values in the [4R] field.

This allows predictions and performance computation.

CHECK the resulting computed data, against the data planned on the CFP: TRIP fuel, RTE RSV fuel, ALTN fuel, FINAL and EXTRA fuel values.

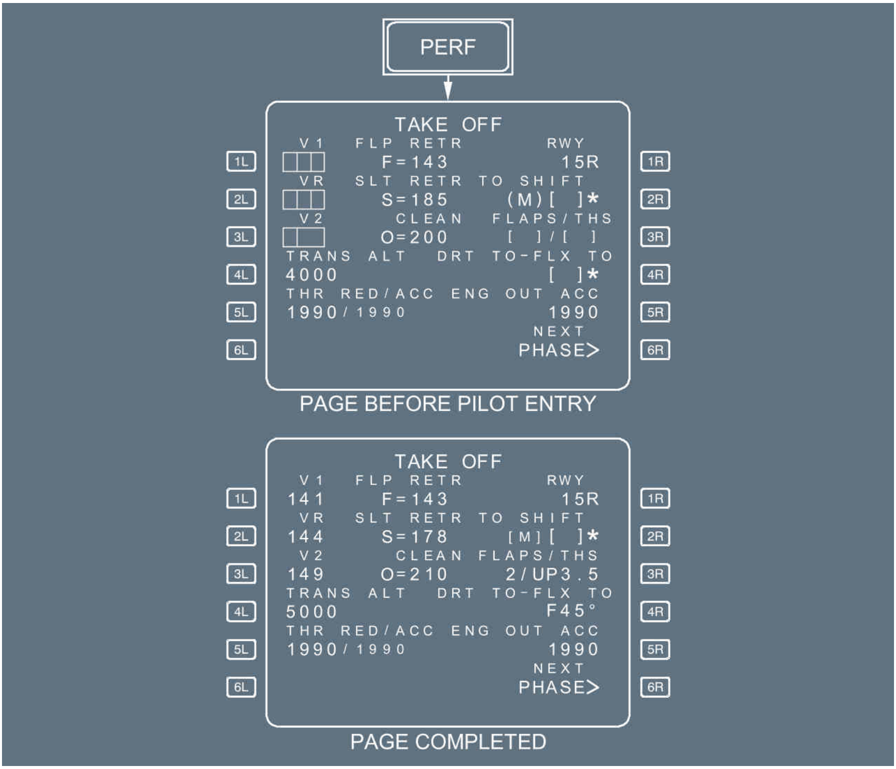
If necessary, the flight crew may modify the ALTN or FINAL fuel values.

PRINT the PREFLIGHT REPORT, if necessary.

When the final load sheet values (ZFW/ZFWCG/BLOCK) have been entered, the crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

Ident.: PRO-NOR-SRP-01-10-B-00002461.0002001 / 09 OCT 12
Applicable to: ALL

TAKEOFF DATA INSERTION



```
            TAKE OFF
  V1     FLP RETR          RWY
[][][]    F=143            15R
  VR     SLT RETR TO SHIFT
[][][]    S=185        (M)[   ]*
  V2         CLEAN   FLAPS/THS
[][][]    O=200        [  ]/[  ]
TRANS ALT    DRT TO-FLX TO
4000                   [   ]*
THR RED/ACC  ENG OUT ACC
1990/1990                 1990
                          NEXT
                        PHASE>
```

PAGE BEFORE PILOT ENTRY

```
            TAKE OFF
  V1     FLP RETR          RWY
 141      F=143            15R
  VR     SLT RETR TO SHIFT
 144      S=178        [M][   ]*
  V2         CLEAN   FLAPS/THS
 149      O=210        2/UP3.5
TRANS ALT    DRT TO-FLX TO
5000                      F45°
THR RED/ACC  ENG OUT ACC
1990/1990                 1990
                          NEXT
                        PHASE>
```

PAGE COMPLETED

PROCEDURE

PRESS the PERF key on MCDU
WRITE successively and ENTER V1, VR, V2 and takeoff shift.
WRITE FLX TO DRT TO. (See procedure below)
CHECK/MODIFY the TRANS ALT (See *) (transition altitude)
CHECK/MODIFY the THR RED ALT (See *) (thrust reduction altitude)
CHECK/MODIFY the ACC ALT (See *) (acceleration altitude)
CHECK/MODIFY the ENG OUT ACC (See *) (engine out acceleration altitude)
CHECK V1, V2 on PFD (See **)

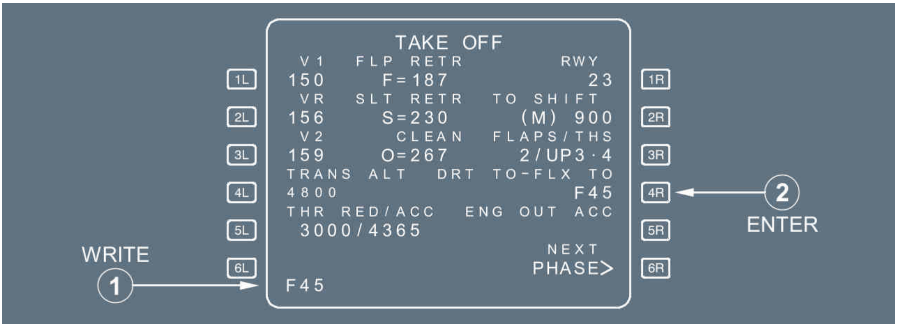
* : Altitudes less than 400 ft above airfield elevation cannot be selected

** : If the PDF does not display V2 at the top of its speed scale, check that at least one FD is ON

ENTERING A FLEX TEMPERATURE

WRITE FXX (XX being 2 digits).
ENTER the FLEX temperature using the [4R] key.

The thrust limit mode and the N1 rating limit are displayed on the ECAM E/WD.

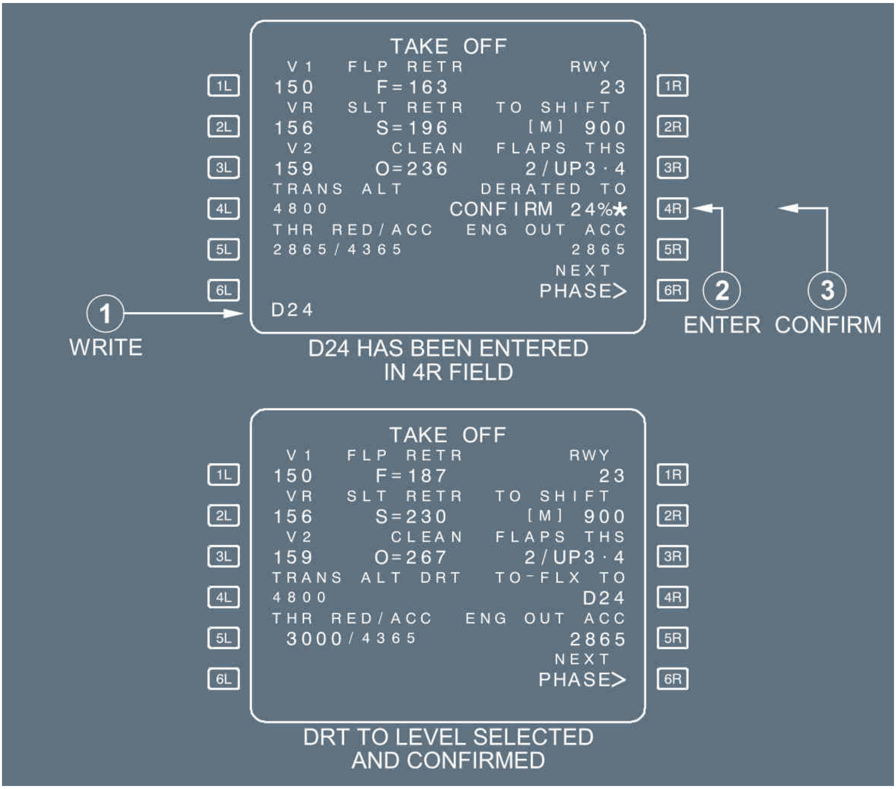


```
         TAKE OFF
 V1   FLP RETR        RWY
150    F=187           23
 VR   SLT RETR    TO SHIFT
156    S=230      (M) 900
 V2      CLEAN   FLAPS/THS
159    O=267      2/UP3.4
TRANS ALT  DRT  TO-FLX  TO
4800                   F45
THR RED/ACC    ENG OUT ACC
 3000/4365
                      NEXT
                    PHASE>
F45
```

ENTERING A DERATED LEVEL

WRITE DXX (XX being 2 digits). Six derate levels are possible: 04, 08, 12, 16, 20, 24 %.
CONFIRM the selection with the [4R] key.

The thrust limit mode and the N1 rating limit are displayed on the ECAM E/WD.


TAKE OFF
V1 FLP RETR RWY
150 F=163 23
VR SLT RETR TO SHIFT
156 S=196 [M] 900
V2 CLEAN FLAPS THS
159 O=236 2/UP3.4
TRANS ALT DERATED TO
4800 CONFIRM 24%*
THR RED/ACC ENG OUT ACC
2865/4365 2865
NEXT
PHASE>
D24
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
1
WRITE
2
ENTER
3
CONFIRM
D24 HAS BEEN ENTERED
IN 4R FIELD
TAKE OFF
V1 FLP RETR RWY
150 F=187 23
VR SLT RETR TO SHIFT
156 S=230 [M] 900
V2 CLEAN FLAPS THS
159 O=267 2/UP3.4
TRANS ALT DRT TO-FLX TO
4800 D24
THR RED/ACC ENG OUT ACC
3000/4365 2865
NEXT
PHASE>
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
DRT TO LEVEL SELECTED
AND CONFIRMED

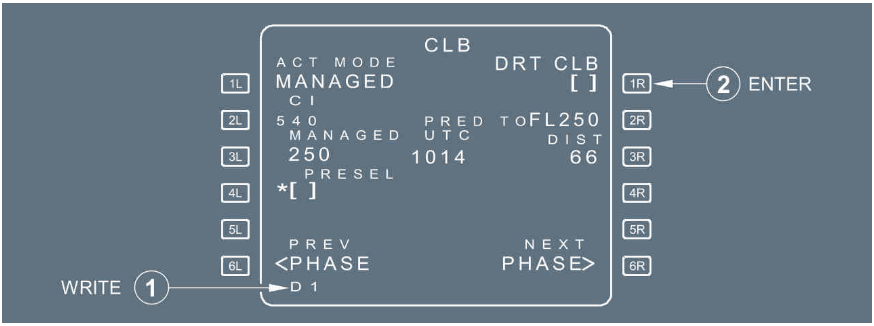
Ident.: PRO-NOR-SRP-01-10-B-00020965.0001001 / 01 MAR 18

Applicable to: ALL

DERATED CLIMB ◁

DATA INSERTION

It is possible to select power ratings lower than max climb for the climb phase, provided that associated performances comply with ATC and terrain clearance requirements. Two levels are available, D1 and D2.


CLB
ACT MODE
MANAGED
DRT CLB
[ ]
CI
540
PRED TOFL250
MANAGED
UTC
DIST
250
1014
66
PRESEL
*[ ]
PREV
<PHASE
NEXT
PHASE>
D 1
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
WRITE
1
2
ENTER

PROCEDURE

PRESS the PERF key on the MCDU.
PRESS the NEXT key to display CLB page.
WRITE the desired derated climb level (D1 or D2) in the scratchpad.
PRESS the [1R] key to ENTER the derated climb level.

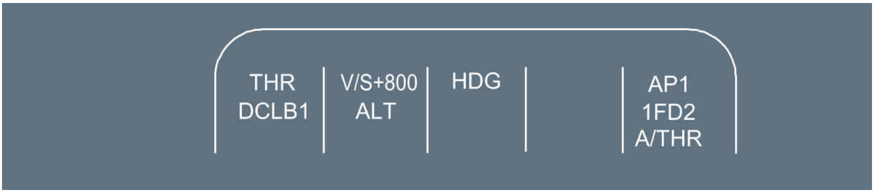
The derated climb level may be inserted/modified/cleared in the MCDU at any moment in PREFLIGHT, TAKEOFF, CLIMB or GO AROUND phases only.

DERATED CLIMB ACTIVATION

The derated climb becomes active when:
- A derated climb level is inserted in the FMGES,
- The thrust levers are set in the CL detent,
- The FMGS is in climb phase.

If there is more than one climb phase (e.g. step climbs), the derated climb is only available on the first climb phase.
The derated climb function does not depend on autothrust, autopilot or flight director engagement.

When the derated climb mode is active, the EWD displays DCLB1(2) thrust rating limit (depending on inserted level D1 or D2) and the associated Thrust Limit Value.
If the A/THR is also active, THR DCLB 1(2) appears in the first column of the FMA.


THR
DCLB1
V/S+800
ALT
HDG
AP1
1FD2
A/THR

DERATED CLIMB DE-ACTIVATION

The derated climb is canceled when:

- The MCDU derated climb level is cleared by the pilot, or
- The FMGES leaves the climb phase, or
- At least one of the thrust levers is set to MCT or above, or
- The slats are extended in flight.

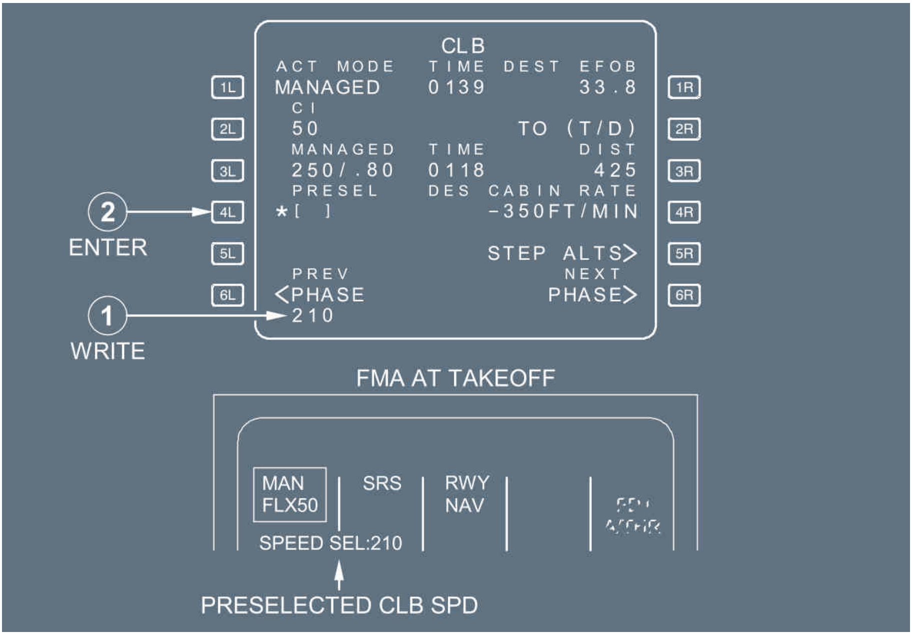
Ident.: PRO-NOR-SRP-01-10-B-00002462.0001001 / 09 OCT 12
Applicable to: ALL

CLIMB SPEED PRESELECTION

If the managed speeds for the initial climb are not suitable, the pilot can preselect an appropriate climb speed on the “PERF CLB” page as long as the climb phase is not active.

The CLB SPD preselection applies when:

- ATC specifies an initial climb speed.
- The initial climb speed must be lower than normal because:
  - There will be turned greater than 120 ° in the initial climb.
  - Obstacle clearance or some other situation requires a high climb angle.
  - The airfield has a risk area to be cleared expeditiously (birds reported, for example).



```
              CLB
ACT MODE      TIME   DEST   EFOB
MANAGED       0139          33.8
 CI
 50                 TO (T/D)
 MANAGED      TIME          DIST
 250/.80      0118           425
 PRESEL       DES  CABIN  RATE
*[  ]              -350FT/MIN

                   STEP ALTS>
 PREV                  NEXT
<PHASE                PHASE>
 210
```

PROCEDURE

PRESS the PERF key on MCDU
PRESS the NEXT PAGE on MCDU
WRITE a climb speed and ENTER it in [4L]
To revert to managed speed, select MANAGED by pressing [3L] key.

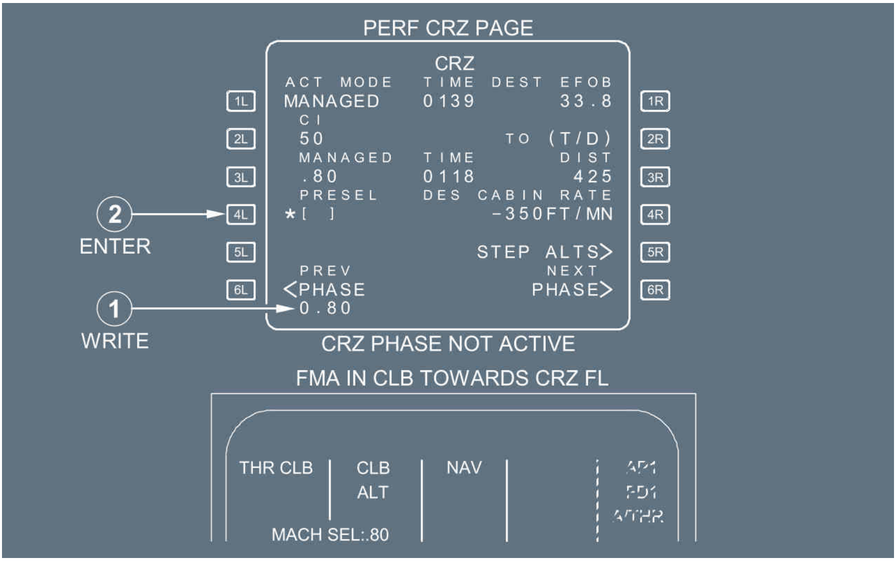
When the aircraft is transitioning into the climb phase, the preselected value becomes the target speed:

- *The selected speed target is active*
- *The primary flight display shows the target speed in blue*
- *The speed window of the FCU displays the new speed or Mach number.*

Ident.: PRO-NOR-SRP-01-10-B-00002463.0001001 / 09 OCT 12
Applicable to: ALL

CRUISE MACH (SPEED) PRESELECTION

The pilot preselects a cruise Mach when it requires a Mach number other than the economy cruise Mach number.
When the aircraft transitions to the cruise phase, the speed target symbol goes to the preselected value and MACH (or SPD) becomes selected (blue target on PFD, target MACH shown in the speed/Mach window of the FCU).



PERF CRZ PAGE

```
                  CRZ
ACT MODE       TIME  DEST   EFOB
MANAGED        0139         33.8
 CI
 50                    TO  (T/D)
 MANAGED       TIME         DIST
 .80           0118          425
 PRESEL        DES  CABIN   RATE
*[   ]                -350FT/MN

                     STEP ALTS>
 PREV                      NEXT
<PHASE                    PHASE>
 0.80
```

CRZ PHASE NOT ACTIVE

FMA IN CLB TOWARDS CRZ FL

```
THR CLB | CLB | NAV |   | AP1
        | ALT |     |   | FD1
                        | A/THR
  MACH SEL:.80
```

PROCEDURE

PRESS the PERF key on MCDU
PRESS the NEXT PAGE key on MCDU until the CRZ page is accessed.
WRITE a cruise Mach (or speed) into the scratchpad and ENTER it in [4L].
To revert to managed speed, PRESS the [3L] key.

The pilot may modify the cruise Mach or speed on ground or in climb. When the cruise phase is active, the pilot cannot preselect a cruise Mach or speed.

Ident.: PRO-NOR-SRP-01-10-B-00002464.0001001 / 03 NOV 21
Applicable to: ALL

ENTERING A HEADING/TRACK PRESET FUNCTION

The heading/track preset allows the flight crew to preset a heading or a track for takeoff or goaround before the flight crew commands the aircraft to take up that heading or track (manual activation).
The flight crew can enter a heading or a track preset while the aircraft is on the ground and until takeoff.

PROCEDURE

Before takeoff:

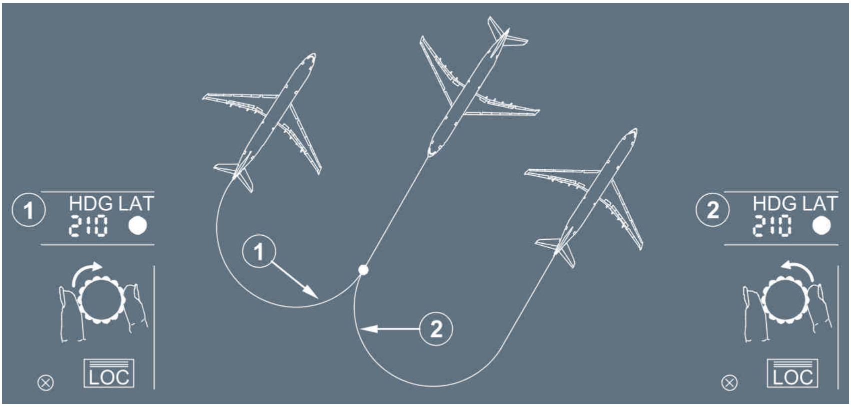
SET the appropriate HDG or TRK in the FCU window.

This disarms the navigation mode and allows the runway mode to remain engaged after takeoff.

To activate the preset after takeoff:

PULL the HDG/TRK selector knob.

The heading or track mode engages on the preset value.



The direction the flight crew rotates the HDG/TRK selection knob usually determines the direction of the turn. A left rotation (decreasing heading) produces a left turn; a right rotation produces a right turn.
However, when a heading has been preset before takeoff or a go-around, the direction of the turn will be such as to cause the shortest turn at the moment of engagement.

CANCELLING THE HEADING/TRACK PRESET FUNCTION

The flight crew can cancel the heading preset by pushing the HDG/TRK selector knob back in again. This makes the navigation mode engage or arm.

FMGES RE-INITIALIZATION AFTER A CANCELED FLIGHT

Ident.: PRO-NOR-SRP-01-10-00013001.0004001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

If the flight crew initially prepared a flight with all the data associated with this flight (takeoff speeds, winds, etc.), and if this flight is later canceled and replaced by another flight, the flight crew may use the following procedure to initialize the FMGES again:

PREPARE the new flight data in the secondary flight plan, using SEC INIT A, SEC INIT FUEL PRED, and SEC PERF pages.
ACTIVATE the secondary flight plan.

Note: *When the flight crew activates the secondary flight plan, the following data of the primary flight plan is lost if the secondary flight plan does not include any replacement data:*
- *Alternate data*
- *Winds and cruise temperature at waypoints as inserted on CRUISE WIND pages*
- *Departure and arrival selection (STAR, APP, RWY) and approach parameters (QNH, TEMP, WIND, TRANS ALT, VAPP, MDA/MDH, DH, LDG CONF)*
- *Altitude, speed, and time constraints*
- *Steps*
- *CMS*
- *Offsets*
- *Flaps/THS*
- *Preselected cruise and descent speeds.*

FMGES RE-INITIALIZATION AFTER A CANCELED FLIGHT

Ident.: PRO-NOR-SRP-01-10-00013001.0001001 / 16 NOV 11
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

If the flight crew initially prepared a flight with all the data associated with this flight (takeoff speeds, winds, etc.), and if this flight is later canceled and replaced by another flight, the flight crew may use the following procedure to initialize the FMGES again:

PREPARE the new flight data in the secondary flight plan, using SEC INIT A, SEC INIT B, and SEC PERF pages
ACTIVATE the secondary flight plan

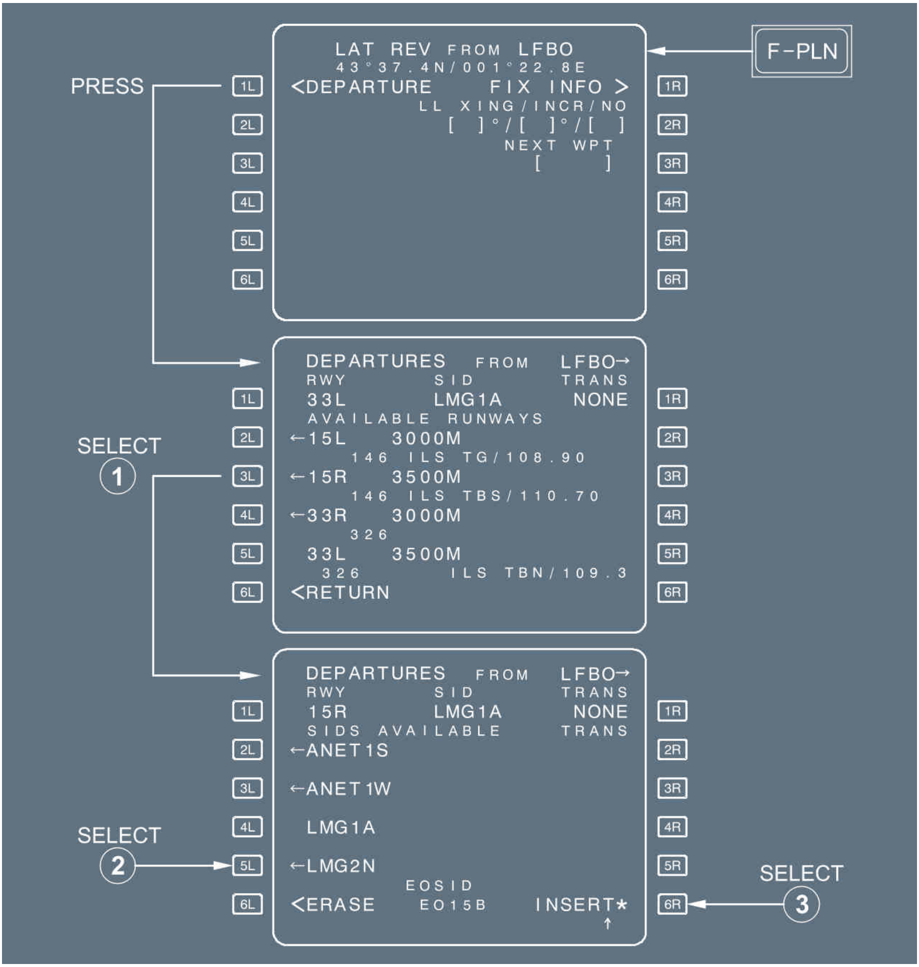
Note: *When the flight crew activates the secondary flight plan, the following data of the primary flight plan is lost if the secondary flight plan does not include any replacement data:*
- *Alternate data*
- *Winds and cruise temp at waypoints as inserted on CRZ WIND pages*
- *Departure and arrival selection (STAR, APP, RWY) and approach parameters (QNH, TEMP, WIND, TRANS ALT, VAPP, MDA/MDH, DH, LDG CONF)*
- *Altitude, speed, and time constraints*
- *Steps*
- *CMS*
- *Offsets*
- *Flaps/THS*
- *Preselected cruise and descent speeds.*

Intentionally left blank

Before Push Back or Start

CHANGE OF RUNWAY

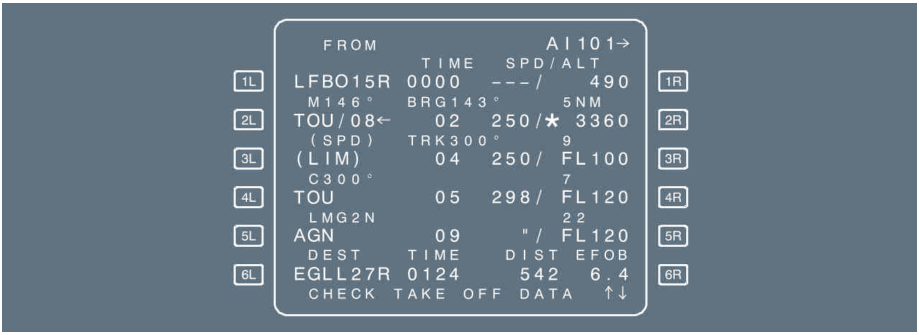
Ident.: PRO-NOR-SRP-01-15-00002465.0002001 / 03 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO



```
LAT REV FROM LFBO
43°37.4N/001°22.8E
<DEPARTURE          FIX INFO >
          LL XING/INCR/NO
          [  ]°/[  ]°/[  ]
                 NEXT WPT
                 [      ]
```

```
DEPARTURES     FROM     LFBO→
RWY            SID      TRANS
33L           LMG1A      NONE
AVAILABLE RUNWAYS
←15L      3000M
     146  ILS  TG/108.90
←15R      3500M
     146  ILS  TBS/110.70
←33R      3000M
     326
 33L      3500M
  326         ILS  TBN/109.3
<RETURN
```

```
DEPARTURES     FROM     LFBO→
RWY            SID      TRANS
15R           LMG1A      NONE
SIDS AVAILABLE          TRANS
←ANET1S

←ANET1W

 LMG1A

←LMG2N
           EOSID
<ERASE     EO15B      INSERT*
                           ↑
```



```
   FROM                   AI101→
            TIME      SPD/ALT
LFBO15R  0000    ---/       490
  M146°   BRG143°          5NM
TOU/08←     02    250/*  3360
  (SPD)   TRK300°          9
(LIM)       04    250/  FL100
  C300°                    7
TOU         05    298/  FL120
  LMG2N                    22
AGN         09      "/  FL120
  DEST     TIME     DIST  EFOB
EGLL27R  0124        542   6.4
  CHECK  TAKE  OFF  DATA    ↑↓
```

PROCEDURE

PRESS the F-PLN key on the MCDU.
SELECT the LAT REV at origin.
SELECT the DEPARTURE prompt [1L].
SELECT the new RWY in use.
SELECT the appropriate SID and TRANS.
CHECK the resulting temporary F-PLN and INSERT it.

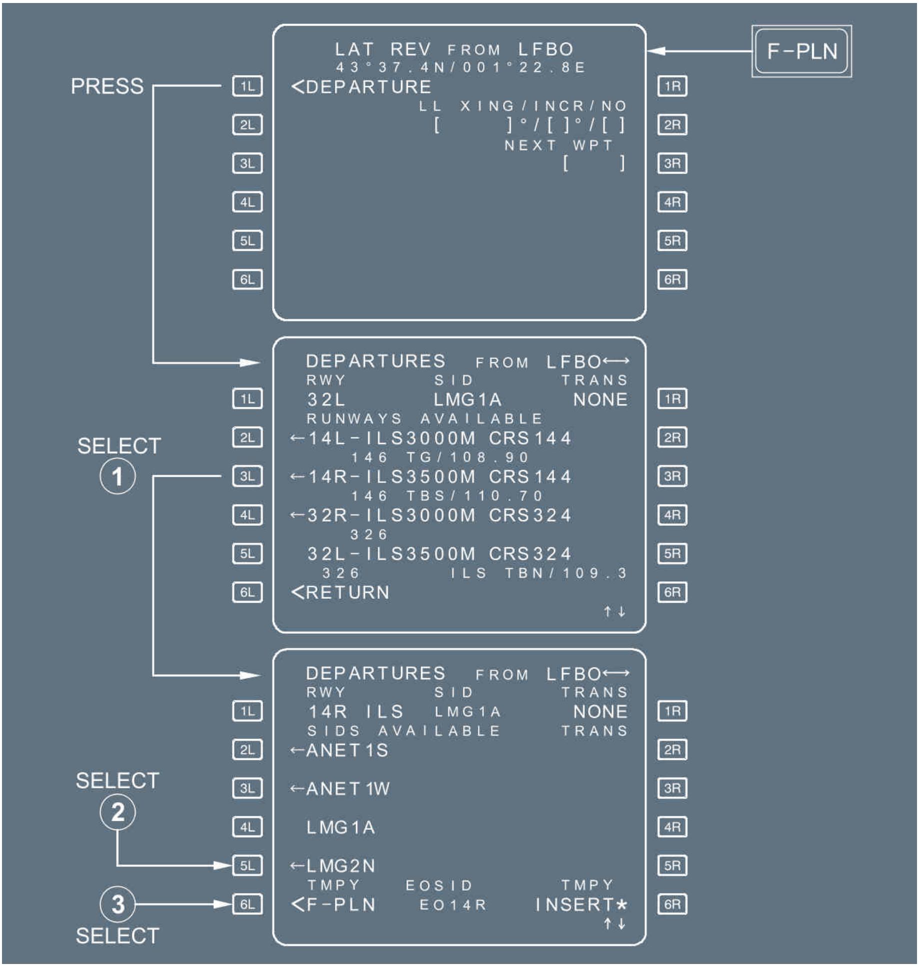
CHECK TAKE OFF DATA comes up in Scratchpad, if the PERF TO page was filled in.

ENTER the new V1, VR, V2, FLEX TEMP (or derated level) or CONF, as appropriate.

Note: *If the previously selected SID is compatible with the new runway, it appears automatically in the temporary flight plan. Any revision the flight crew may have made to the previous SID will not be transferred.*
If the flight crew still wants it, the flight crew has to reenter it.

CHANGE OF RUNWAY

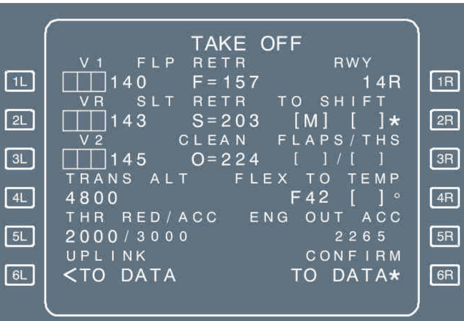
Ident.: PRO-NOR-SRP-01-15-00002465.0003001 / 03 NOV 21
Applicable to: LV-KHT, LV-KHU



```
   LAT REV FROM LFBO
   43°37.4N/001°22.8E
<DEPARTURE
              LL XING/INCR/NO
              [      ]°/[ ]°/[ ]
                      NEXT WPT
                        [     ]
```

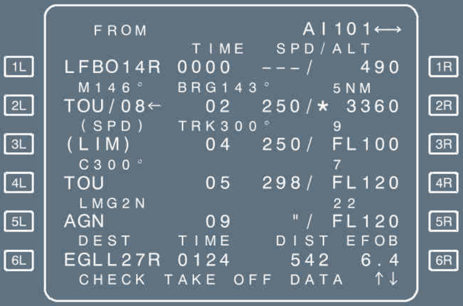
```
  DEPARTURES   FROM  LFBO←→
  RWY          SID        TRANS
  32L          LMG1A       NONE
  RUNWAYS AVAILABLE
←14L-ILS3000M CRS144
     146  TG/108.90
←14R-ILS3500M CRS144
     146  TBS/110.70
←32R-ILS3000M CRS324
     326
  32L-ILS3500M CRS324
   326       ILS  TBN/109.3
<RETURN
                          ↑↓
```

```
  DEPARTURES   FROM  LFBO←→
  RWY          SID        TRANS
  14R ILS      LMG1A       NONE
  SIDS AVAILABLE          TRANS
←ANET1S

←ANET1W

  LMG1A

←LMG2N
  TMPY     EOSID         TMPY
<F-PLN      EO14R      INSERT*
                          ↑↓
```



```
              TAKE  OFF
 V1     FLP  RETR            RWY
□□□140   F=157               14R
 VR     SLT  RETR     TO SHIFT
□□□143   S=203     [M]  [  ]*
 V2        CLEAN      FLAPS/THS
□□□145   O=224     [  ]/[  ]
TRANS ALT        FLEX TO TEMP
4800                F42 [  ]°
THR RED/ACC      ENG OUT ACC
2000/3000              2265
UPLINK                CONFIRM
<TO DATA             TO DATA*
```

PERF TO PAGE AFTER
TMPY F-PLN INSERTION



```
  FROM                AI101←→
            TIME    SPD/ALT
LFBO14R  0000   ---/     490
  M146°   BRG143°        5NM
TOU/08←     02   250/*  3360
  (SPD)   TRK300°        9
(LIM)       04   250/  FL100
  C300°                  7
TOU         05   298/  FL120
  LMG2N                  22
AGN         09     "/  FL120
  DEST     TIME    DIST  EFOB
EGLL27R  0124      542   6.4
  CHECK  TAKE  OFF  DATA   ↑↓
```

F-PLN A PAGE AFTER
TMPY F-PLN INSERTION

PROCEDURE

PRESS the F-PLN key on the MCDU.
SELECT the LAT REV at origin.
SELECT the DEPARTURE prompt [1L].
SELECT the new RWY in use.

The “CHECK TAKEOFF DATA” message is displayed.

CHECK/SELECT the appropriate SID and TRANS.
CHECK and INSERT the TMPY F-PLN, or continue with next revision.
PRESS the PERF key to access PERF TAKEOFF page.
CHECK the V1, VR, V2, and FLEX values displayed after the amber boxes. If these values are correct, PRESS [6R] to confirm and insert them. Else, ENTER new values.

ENTER the new V1, VR, V2, FLEX TEMP (or derated level) or CONF, as appropriate.

The previously entered values, adjacent to the boxes, may be re-selected by pressing the CONFIRM TO DATA prompt on [6R].*

Note:
1. *In case of a runway change, any previous lateral modification performed on the active DEPARTURE procedure may lead to additional waypoint stacking in the temporary F-PLN. The flight crew has to revise it, as necessary.*
2. *If the previously selected SID is compatible with the new runway, it automatically appears in the temporary flight plan. Any revision the flight crew may have made to the previous SID will not be transferred*
   If the flight crew still wants it, the flight crew has to reenter it.

TAKEOFF FROM INTERSECTION

Ident.: PRO-NOR-SRP-01-15-00002466.0001001 / 10 DEC 09
Applicable to: ALL

Use RTOW or FCOM to revise takeoff parameters
PRESS the [PERF] key on MCDU
ENTER the takeoff shift
ENTER the new V1, VR, V2, FLX TEMP (or derated level), or CONF, as appropriate

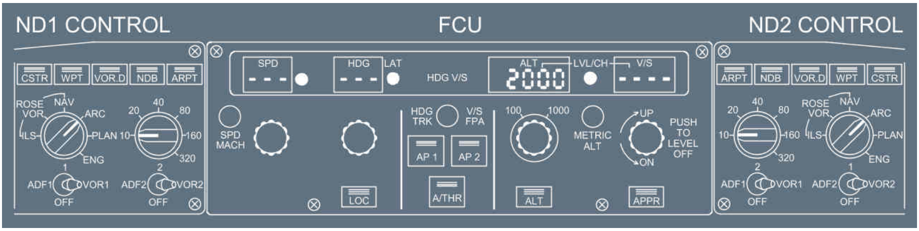
Note: *The insertion of the shift in takeoff position permits the system to make an accurate revision to its navigation data at takeoff.*

Intentionally left blank

Taxi

FCU SELECTION FOR TAKEOFF

Ident.: PRO-NOR-SRP-01-20-00002467.0001001 / 09 OCT 12
Applicable to: ALL


ND1 CONTROL
FCU
ND2 CONTROL
CSTR
WPT
VOR.D
NDB
ARPT
ROSE
VOR
NAV
ARC
ILS
PLAN
ENG
10
20
40
80
160
320
ADF1
VOR1
OFF
ADF2
VOR2
SPD
HDG
LAT
HDG V/S
ALT
LVL/CH
V/S
2000
SPD
MACH
HDG
TRK
V/S
FPA
AP 1
AP 2
A/THR
LOC
100
1000
METRIC
ALT
UP
ON
PUSH
TO
LEVEL
OFF
ALT
APPR

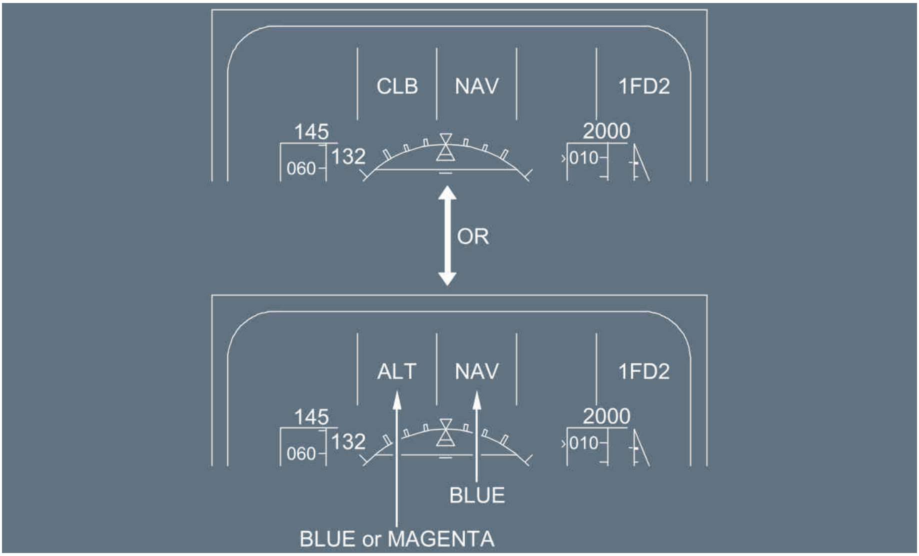
PROCEDURE

ENSURE that HDG – V/S modes are selected (change over pb).
CONFIRM or SELECT the first cleared altitude
CROSS CHECK on PFD the target altitude
CONFIRM both FDs ON

FMA MODE CHECK

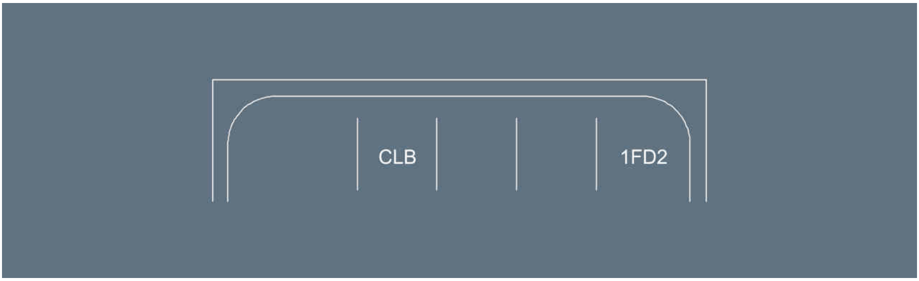
Ident.: PRO-NOR-SRP-01-20-00002468.0001001 / 09 OCT 12
Applicable to: ALL

CHECK that the FMA CLB (or ALT) mode is armed on column 2.


CLB
NAV
1FD2
145
060
132
2000
010
OR
ALT
NAV
1FD2
145
060
132
2000
010
BLUE
BLUE or MAGENTA

Note: *ALT (in blue or magenta) may be displayed instead of CLB if the FCU altitude or a constraint is set at or below the acceleration altitude.*

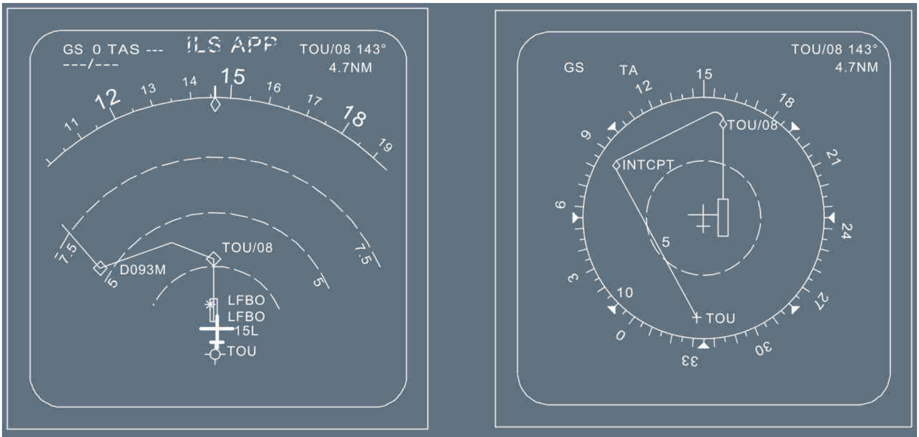
If a HDG/TRK was preset, NAV is disarmed.



SELECTING A NAVIGATION DISPLAY

Ident.: PRO-NOR-SRP-01-20-00002469.0001001 / 17 MAR 11
Applicable to: ALL

SET the minimum range to display the first waypoint after departure, or as required for weather radar.

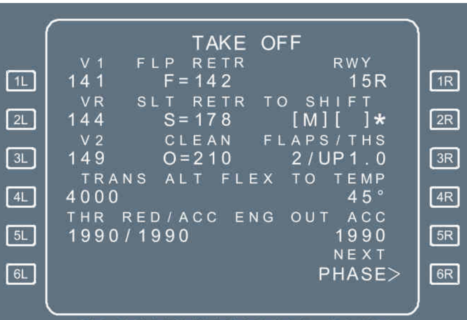

GS 0 TAS ---
---/---
ILS APP
TOU/08 143°
4.7NM
11
12
13
14
15
16
17
18
19
7.5
5
D093M
TOU/08
LFBO
LFBO
15L
TOU
GS
TA
TOU/08 143°
4.7NM
9
12
15
18
21
24
27
30
33
0
3
6
TOU/08
INTCPT
5
10
TOU

ARC mode
FOR DEPARTURE IN GENERAL DIRECTION
OF RUNWAY HEADING

Rose NAV mode
FOR DEPARTURE IN DIRECTION OPPOSITE
TO THAT OF RUNWAY HEADING

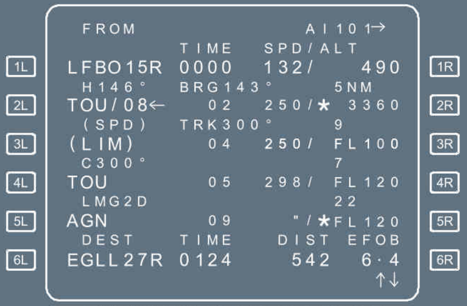
SELECTING TAKEOFF DISPLAYS FOR PF AND PM MCDU

Ident.: PRO-NOR-SRP-01-20-00002470.0001001 / 23 DEC 14
Applicable to: ALL



```
         TAKE OFF
 V1   FLP RETR        RWY
141    F=142          15R
 VR   SLT RETR   TO SHIFT
144    S=178       [M][  ]*
 V2    CLEAN     FLAPS/THS
149    O=210       2/UP1.0
 TRANS ALT  FLEX TO TEMP
4000                  45°
THR RED/ACC  ENG OUT ACC
1990/1990            1990
                     NEXT
                   PHASE>
```

PF SELECTS PERF T.O. PAGE



```
 FROM                 AI101→
          TIME   SPD/ALT
LFBO15R   0000   132/    490
 H146°    BRG143°      5NM
TOU/08←     02   250/* 3360
 (SPD)    TRK300°      9
(LIM)       04   250/ FL100
 C300°                 7
TOU         05   298/ FL120
 LMG2D                22
AGN         09    "/*FL120
 DEST     TIME    DIST  EFOB
EGLL27R   0124     542   6.4
                          ↑↓
```

PM SELECTS F-PLN A PAGE

TAKEOFF

MONITORING THE TAKEOFF

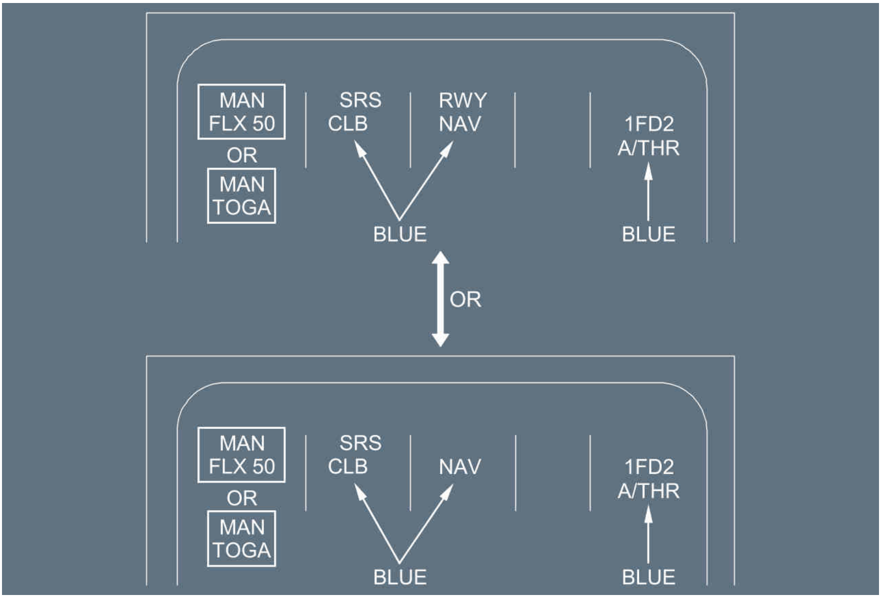
Ident.: PRO-NOR-SRP-01-30-00002471.0001001 / 09 OCT 12
Applicable to: ALL

- **At power set (thrust levers in FLX or TOGA position)**

  CHECK that the navigation is updated to the runway threshold by verifying that the aircraft symbol is centered on the runway threshold of the navigation display.

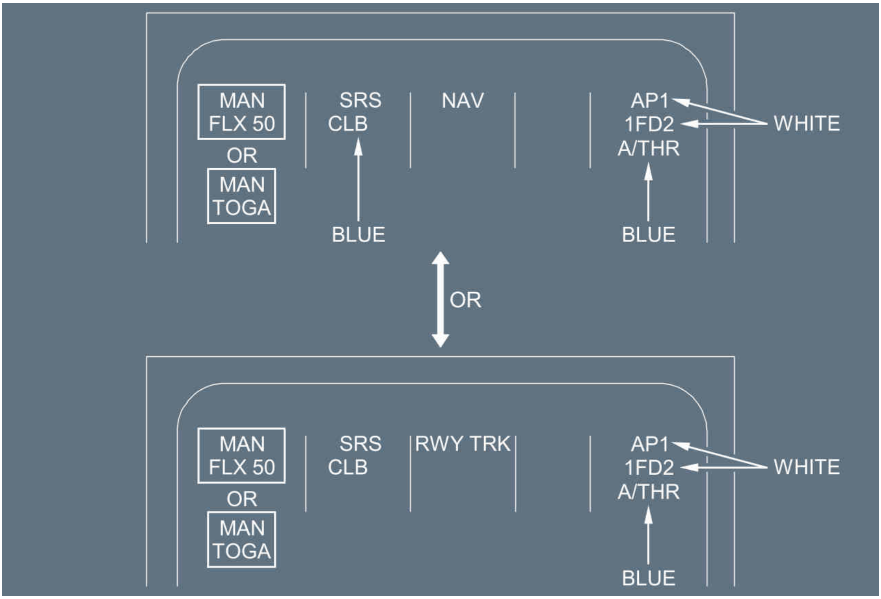
  CHECK the FMA for appropriate mode selection

  Note:
  - *RWY mode appears if an ILS is tuned to a station corresponding to the departure runway. Otherwise no lateral mode comes up until the aircraft has lifted off.*
  - *Until the aircraft is airborne, do not rely on the wind displayed on the NDs.*


MAN
FLX 50
OR
MAN
TOGA
SRS
CLB
RWY
NAV
1FD2
A/THR
BLUE
BLUE
OR
MAN
FLX 50
OR
MAN
TOGA
SRS
CLB
NAV
1FD2
A/THR
BLUE
BLUE

- **At 30 ft**
  - **If NAV is armed** it automatically engages.

- **If NAV is not armed** RWY TRK mode engages and remains displayed until the crew selects another lateral mode.


MAN
FLX 50
OR
MAN
TOGA
SRS
CLB
BLUE
NAV
AP1
1FD2
A/THR
BLUE
WHITE
OR
MAN
FLX 50
OR
MAN
TOGA
SRS
CLB
RWY TRK
AP1
1FD2
A/THR
BLUE
WHITE

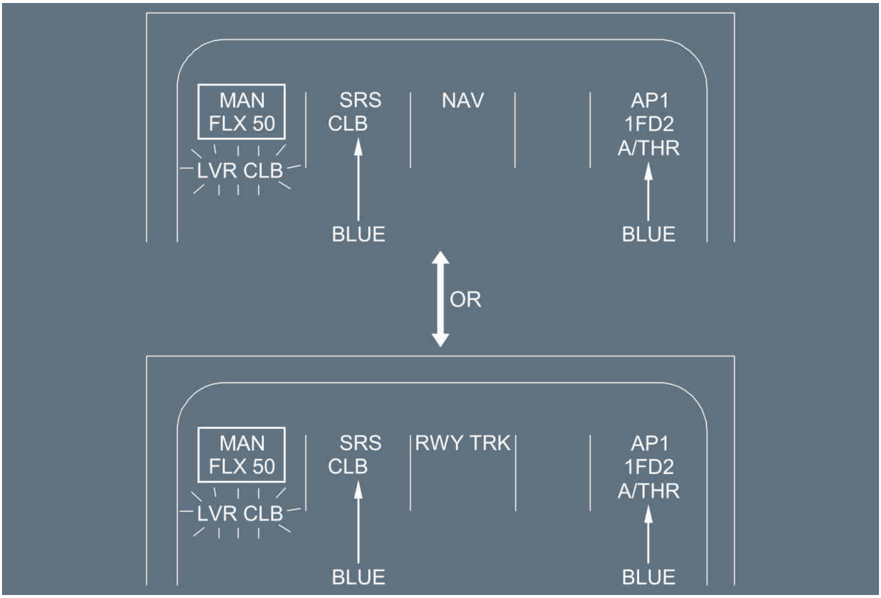
- **At 100 ft :**

  Engage AP1 or AP2.

  The FMGS has an internal delay that prevents the AP to be engaged during 5 s after lift-off.

- **At thrust reduction altitude :**

  “LVR CLB” flashes in the first column of the FMA


MAN
FLX 50
LVR CLB
SRS
CLB
NAV
AP1
1FD2
A/THR
BLUE
BLUE
OR
MAN
FLX 50
LVR CLB
SRS
CLB
RWY TRK
AP1
1FD2
A/THR
BLUE
BLUE

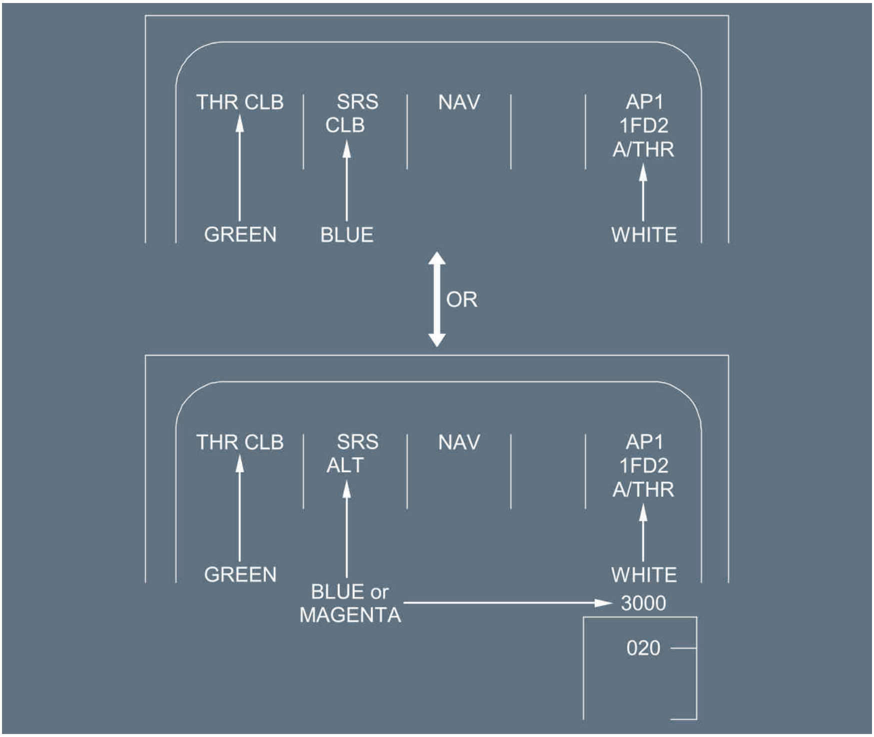
PROCEDURE

SET the thrust levers to the CL detent.

Autothrust automatically activates.

CHECK that A/THR turns to white in the 5th FMA column.

CHECK that THR CLB appears in green in the 1 st FMA column.


THR CLB
SRS
CLB
NAV
AP1
1FD2
A/THR
GREEN
BLUE
WHITE
OR
THR CLB
SRS
ALT
NAV
AP1
1FD2
A/THR
GREEN
BLUE or
MAGENTA
WHITE
3000
020

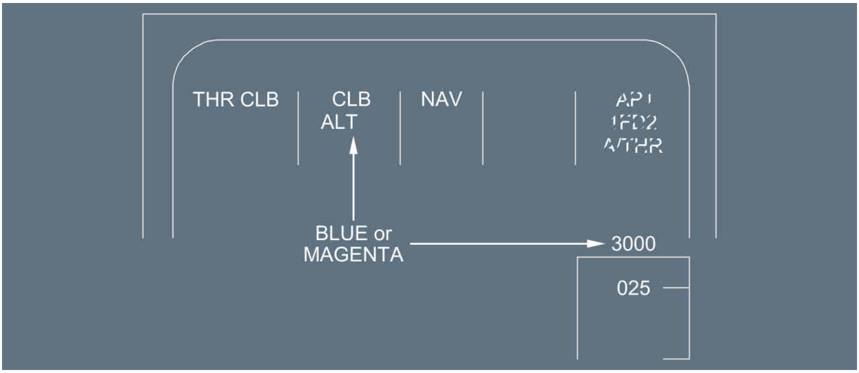
Depending on the next level off altitude, CLB or ALT is armed and displayed in the second column.

ALT is armed :
- *In blue, if the next predicted level-off is the FCU-selected altitude (target altitude blue at the top of the ALT scale).*
- *In magenta, if the next predicted level-off is an ALT CSTR (target altitude magenta at the top of the ALT scale).*

● **At acceleration altitude**

The vertical phase automatically switches to climb.

CLB mode engages. The target speed jumps to initial climb speed on the PFD.



PROCEDURE

CHECK that “CLB” appears in green in the second FMA column.

- *The speed reference system (SRS) mode remains engaged until CLB phase is engaged, which occurs at ACCEL ALT or at any other vertical mode engagement, whichever comes first.*
- *If during takeoff the FCU altitude is set below the current aircraft altitude, the system ignores the FCU altitude and the aircraft remains in SRS mode until the pilot selects an altitude above the aircraft altitude or engages any other mode.*

PRESELECTING HEADING OR TRACK

Ident.: PRO-NOR-SRP-01-30-00002472.0001001 / 18 MAR 11
Applicable to: ALL

PROCEDURE

● **If a HDG or a TRK was preselected on the ground :**

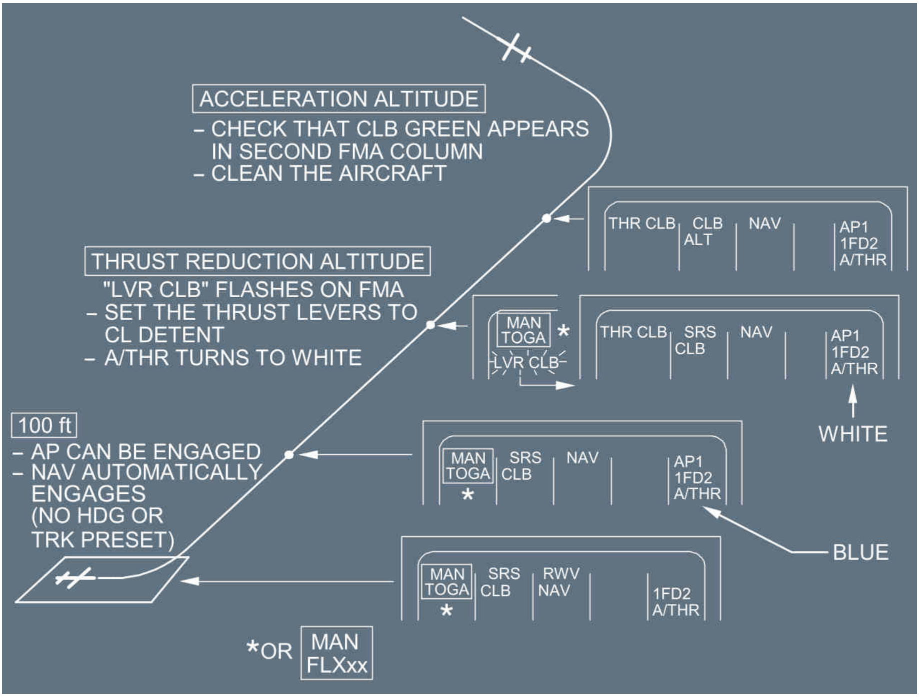
PULL OUT the HDG/TRK selector knob when required

CHECK that the HDG/TRK mode is active and displayed on the FMA

When a HDG or TRK is preset, OP CLB mode will engage at the acceleration altitude. (CLB mode is not available in HDG/TRK mode).

NORMAL TAKEOFF PROFILE

Ident.: PRO-NOR-SRP-01-30-00002473.0001001 / 09 OCT 12
Applicable to: ALL


ACCELERATION ALTITUDE
– CHECK THAT CLB GREEN APPEARS IN SECOND FMA COLUMN
– CLEAN THE AIRCRAFT
THR CLB
CLB
ALT
NAV
AP1
1FD2
A/THR
THRUST REDUCTION ALTITUDE
"LVR CLB" FLASHES ON FMA
– SET THE THRUST LEVERS TO CL DETENT
– A/THR TURNS TO WHITE
MAN TOGA *
LVR CLB
THR CLB
SRS CLB
NAV
AP1
1FD2
A/THR
WHITE
100 ft
– AP CAN BE ENGAGED
– NAV AUTOMATICALLY ENGAGES (NO HDG OR TRK PRESET)
MAN TOGA *
SRS CLB
NAV
AP1
1FD2
A/THR
BLUE
MAN TOGA *
SRS CLB
RWY NAV
1FD2
A/THR
*OR MAN FLXxx

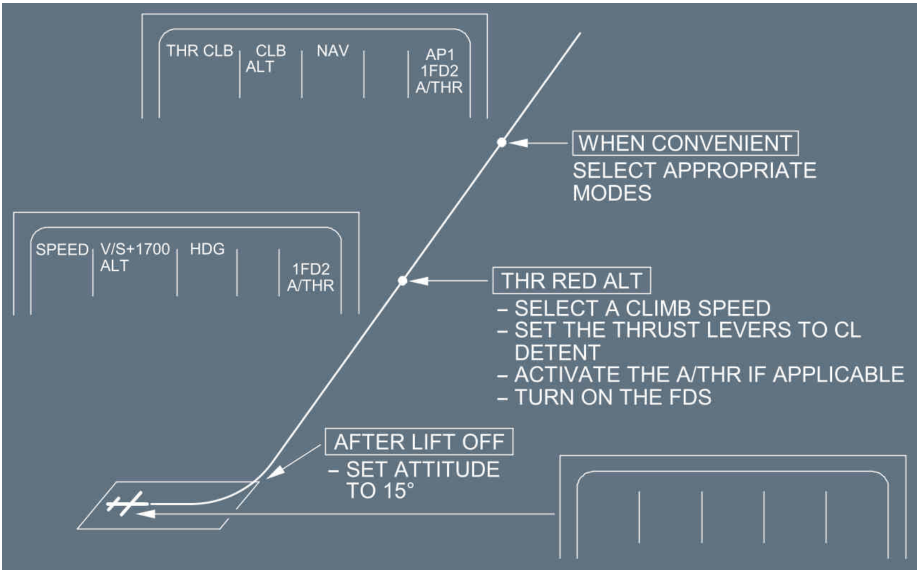
NO FLIGHT DIRECTOR TAKEOFF

Ident.: PRO-NOR-SRP-01-30-00002474.0002001 / 20 SEP 13
Applicable to: ALL

If a takeoff is initiated without FDs, the system responds as follow :

- There are no FD bars
- There is no autothrust arming
- There is no guidance available
- The target speed on the PFD is that selected on the FCU or is defaulted to 100 kt
- Setting the thrust levers to the CL detent does not activate autothrust.

Note: *Do not engage the autothrust prior to selecting a target speed on the FCU.*


THR CLB
CLB
ALT
NAV
AP1
1FD2
A/THR
WHEN CONVENIENT
SELECT APPROPRIATE MODES
SPEED
V/S+1700
ALT
HDG
1FD2
A/THR
THR RED ALT
– SELECT A CLIMB SPEED
– SET THE THRUST LEVERS TO CL DETENT
– ACTIVATE THE A/THR IF APPLICABLE
– TURN ON THE FDS
AFTER LIFT OFF
– SET ATTITUDE TO 15°

PROCEDURE

Establish a pitch attitude of 15 ° in initial climb.

- **When reaching the thrust reduction altitude (THR RED ALT)**

  SELECT a climb speed

  SET the thrust levers to CL detent

  ACTIVATE the autothrust

  TURN ON the FDs (basic modes engage)

  SELECT appropriate mode.

  Failure of both FDs after the start of takeoff

  - *The FD bars disappear*
  - *The FCU window displays the target speed, which synchronizes on V2 or the current speed (if it is higher)*
  - *The autothrust remains armed*
  - *At thrust reduction altitude, LVR CLB flashes. If the pilot set the thrust levers to the CLB detent, the autothrust becomes active in selected SPD mode (no FDs selected). If the current speed is greater than the target speed, the thrust decreases*
  - *At acceleration altitude the target speed does not change, since it is selected.*

TAKEOFF WITH NO V2 ENTRY

Ident.: PRO-NOR-SRP-01-30-00002475.0001001 / 18 MAR 11
Applicable to: ALL

If V2 is not inserted the speed reference system (SRS) will not engage for takeoff. Five seconds after lift off V/S mode will engage. When V/S engages the current airspeed becomes the FCU target speed.

To regain a normal speed target, the pilot must :

SELECT the appropriate climb speed on FCU and PULL out the knob.

- **At ACC ALT :**

  PUSH the A/THR pusbutton on the FCU.

  SET the thrust levers to CL detent.

  PUSH in the SPD selector knob to get a managed speed target.

TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY

Ident.: PRO-NOR-SRP-01-30-00002476.0004001 / 09 OCT 12
Applicable to: ALL

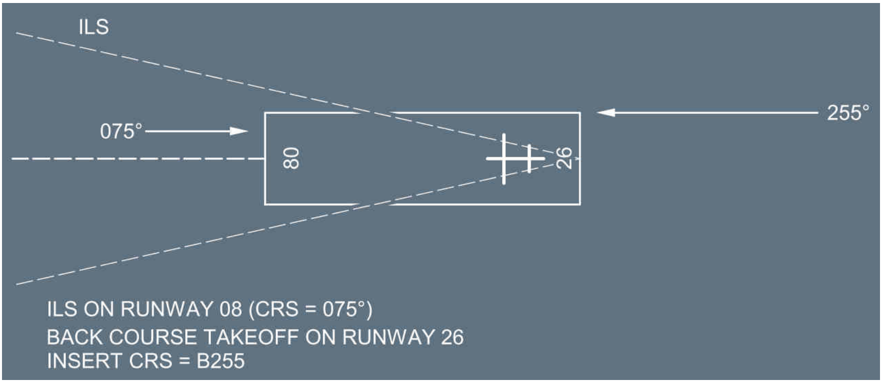
If the localizer, of the ILS associated with the opposite runway, must be used for takeoff :

SELECT the RAD NAV page.
ENTER the ILS IDENT.
If the ILS is in the database, the system tunes the proper frequency.
Check that the ILS front course is displayed in the CRS filed.

Note: *This may trigger the “RWY/ILS MISMATCH” message. Disregard it.*

- **If the ILS is not in the database :**

  INSERT the takeoff runway course with a "B".



ILS ON RUNWAY 08 (CRS = 075°)
BACK COURSE TAKEOFF ON RUNWAY 26
INSERT CRS = B255

DESELECT the LS pushbutton on ISIS.

Since ISIS displays the LOC reverse deviation.

SELECT ROSE ILS on one ND.

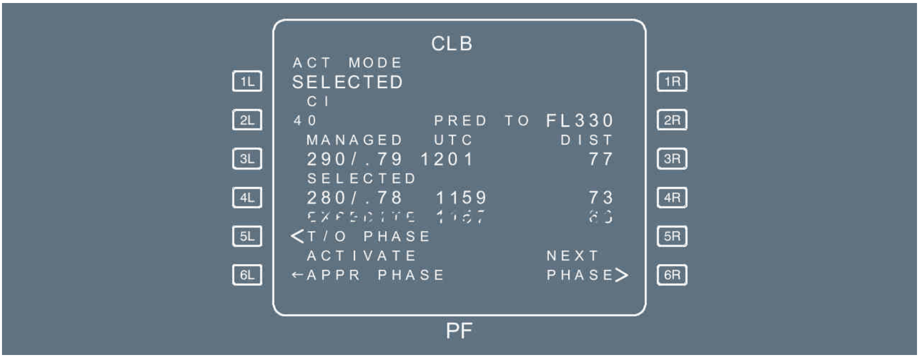
Intentionally left blank

Climb

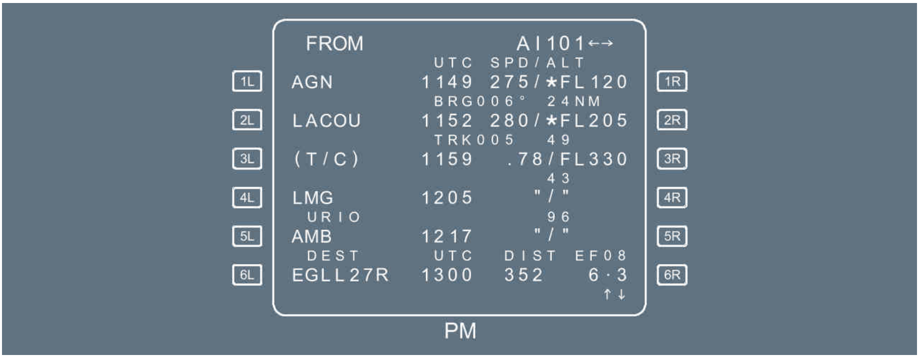
MONITORING THE CLIMB PHASE

Ident.: PRO-NOR-SRP-01-40-00002477.0001001 / 23 DEC 14
Applicable to: ALL

The PF MCDU should display the PERF CLB page allowing him to monitor the climb.
The PM MCDU should display the F-PLN page to allow the flight crew to monitor time, speed and altitude predictions. This page also displays matched or missed information for constraints.



```
              CLB
 ACT MODE
 SELECTED
  CI
 40          PRED  TO  FL330
  MANAGED    UTC        DIST
  290/.79  1201          77
  SELECTED
  280/.78   1159         73
  EXPEDITE  1157         63
<T/O PHASE
  ACTIVATE             NEXT
←APPR PHASE            PHASE>
```

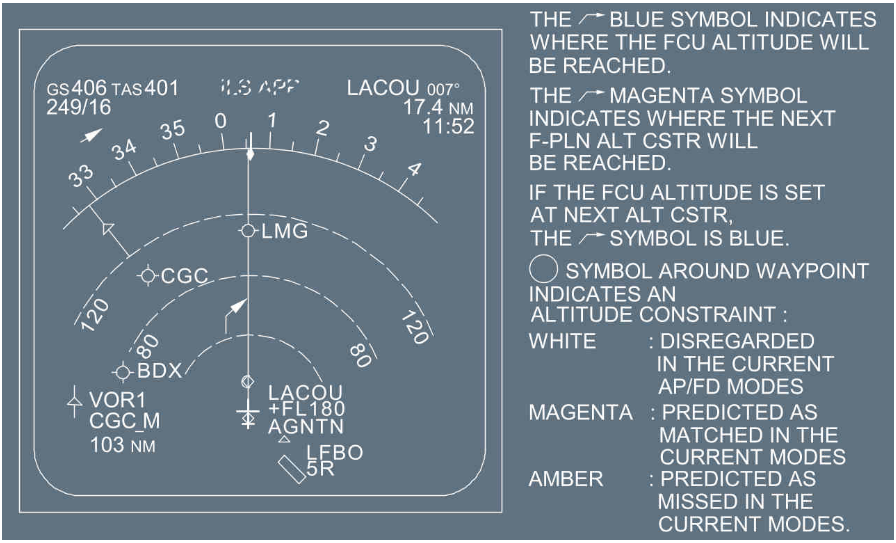


```
  FROM                A I 101←→
           UTC  SPD/ALT
 AGN       1149 275/*FL120
           BRG006°  24NM
 LACOU     1152 280/*FL205
           TRK005   49
 (T/C)     1159  .78/FL330
                    43
 LMG       1205      "/"
   URIO             96
 AMB       1217      "/"
   DEST     UTC  DIST  EF08
 EGLL27R   1300  352   6·3
                        ↑↓
```

CHECK on FMA vertical mode CLB if NAV is engaged.
CHECK on FMA vertical mode OP CLB if HDG/TRK is engaged.

MONITORING THE ND (ROSE NAV OR ARC)

Displays the lateral and vertical paths, in the current AP/FD active modes.


GS406 TAS401
249/16
ILS APP
LACOU 007°
17.4 NM
11:52
33
34
35
0
1
2
3
4
LMG
CGC
120
120
80
80
BDX
VOR1
CGC_M
103 NM
LACOU
+FL180
AGNTN
LFBO
5R

THE ↗ BLUE SYMBOL INDICATES WHERE THE FCU ALTITUDE WILL BE REACHED.

THE ↗ MAGENTA SYMBOL INDICATES WHERE THE NEXT F-PLN ALT CSTR WILL BE REACHED.

IF THE FCU ALTITUDE IS SET AT NEXT ALT CSTR, THE ↗ SYMBOL IS BLUE.

○ SYMBOL AROUND WAYPOINT INDICATES AN ALTITUDE CONSTRAINT :

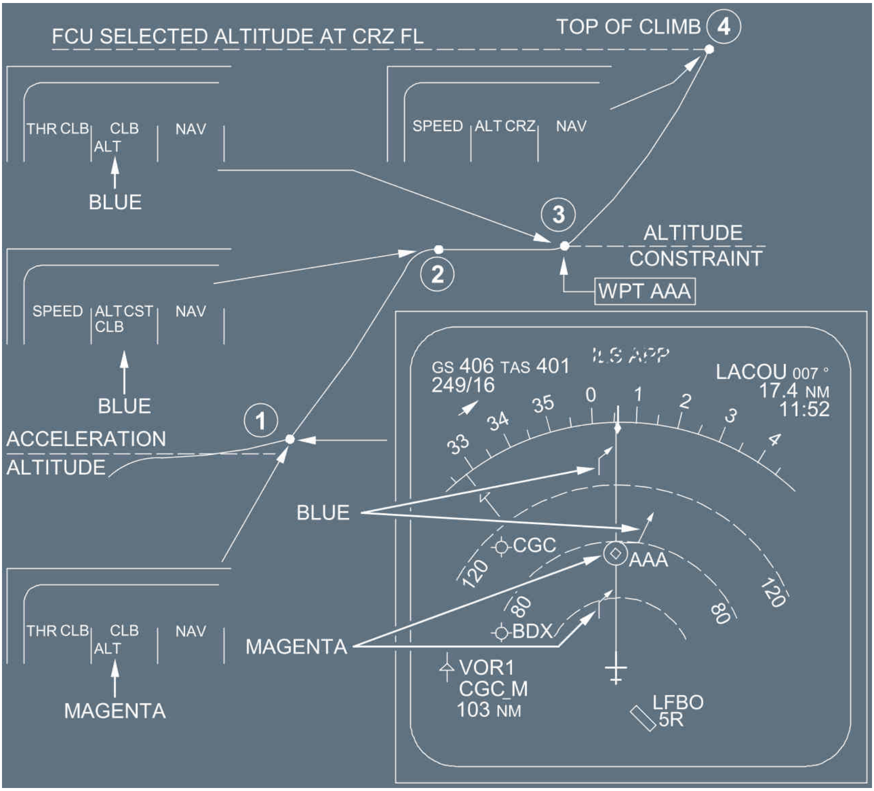
WHITE	: DISREGARDED IN THE CURRENT AP/FD MODES
MAGENTA	: PREDICTED AS MATCHED IN THE CURRENT MODES
AMBER	: PREDICTED AS MISSED IN THE CURRENT MODES.

MONITORING THE AP/FD MODES AND FMA

If CLB mode is engaged, the flight mode annunciator (FMA) and the navigation display (ND) show the tactical situation as follows :

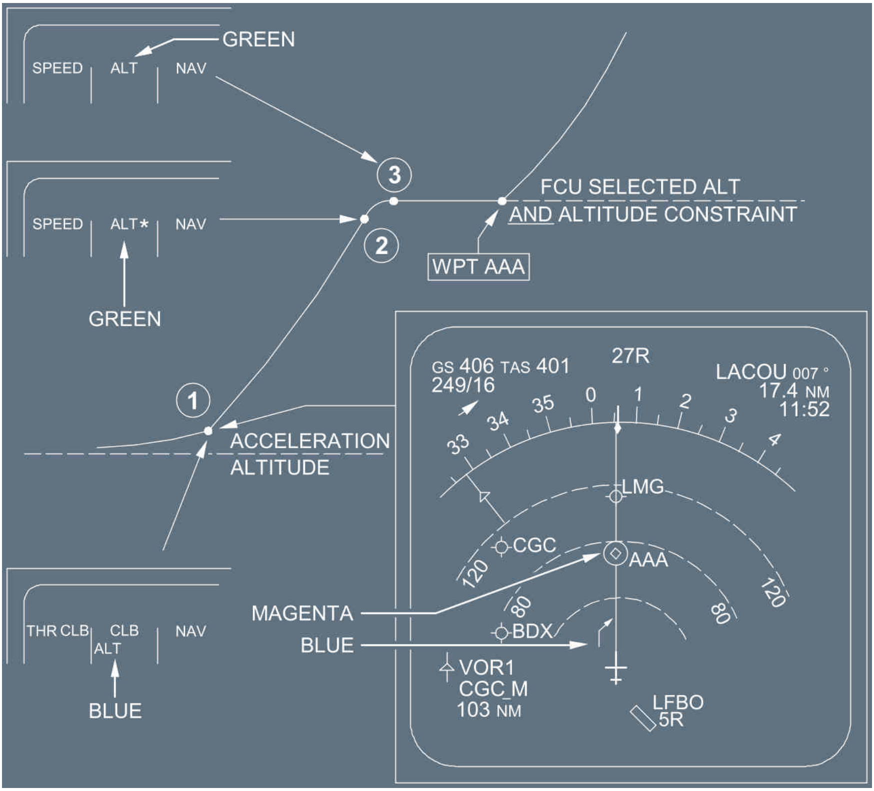
CASE 1

The FCU selected altitude is set above the next altitude constraint


FCU SELECTED ALTITUDE AT CRZ FL
TOP OF CLIMB
4
THR CLB
CLB
ALT
NAV
BLUE
SPEED
ALT CRZ
NAV
3
ALTITUDE
CONSTRAINT
WPT AAA
2
SPEED
ALT CST
CLB
NAV
BLUE
1
ACCELERATION
ALTITUDE
BLUE
THR CLB
CLB
ALT
NAV
MAGENTA
MAGENTA
GS 406 TAS 401
249/16
ILS APP
LACOU 007 °
17.4 NM
11:52
CGC
AAA
BDX
VOR1
CGC_M
103 NM
LFBO
5R

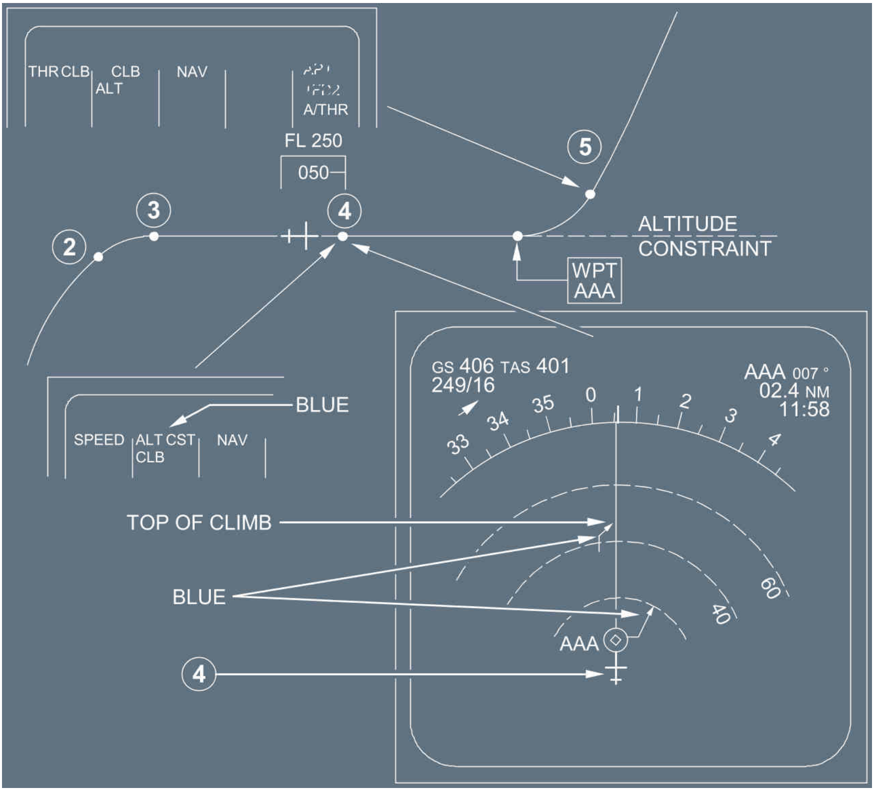
CASE 2

The FCU selected altitude is set at the next altitude constraint
This aircraft will automatically levels off at this altitude.


GREEN
SPEED
ALT
NAV
3
SPEED
ALT*
NAV
2
GREEN
FCU SELECTED ALT
AND ALTITUDE CONSTRAINT
WPT AAA
1
ACCELERATION
ALTITUDE
THR CLB
CLB
ALT
NAV
BLUE
MAGENTA
BLUE
GS 406 TAS 401
249/16
27R
LACOU 007 °
17.4 NM
11:52
33
34
35
0
1
2
3
4
LMG
CGC
AAA
120
80
BDX
120
80
VOR1
CGC_M
103 NM
LFBO
5R

To resume the climb automatically when the waypoint AAA is reached, apply the following procedure during the level off (Position 4) :

SELECT the FCU altitude to the next constraint (if any) or the cruise FL.
PUSH the FCU ALT selector knob to arm CLB mode.


THR CLB
CLB
ALT
NAV
AP1
FD2
A/THR
FL 250
050
5
3
2
4
ALTITUDE
CONSTRAINT
WPT
AAA
BLUE
SPEED
ALT CST
CLB
NAV
GS 406 TAS 401
249/16
AAA 007 °
02.4 NM
11:58
33
34
35
0
1
2
3
4
TOP OF CLIMB
BLUE
60
40
AAA
4

RECOMMENDATION

To ensure that you will not miss the next constraint, it is recommended to select the FCU altitude to the next constraint as described above.

MONITORING THE CONSTRAINTS

SPEED, ALTITUDE and TIME constraints can be checked using MCDUs. Each constraint is preceded by a star that indicates if the constraint is matched (magenta star) or missed (amber star).

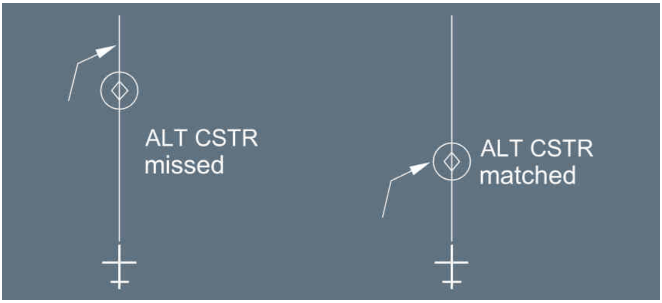
ALTITUDE CONSTRAINT

- **If an altitude constraint is predicted as missed,** use the following procedure :

  SET the FCU ALT to the next ALT CSTR

CHECK the position of the level off symbol on the ND (blue arrow) with respect to the waypoint with the constraint.

DECREASE the target speed until the constraint is met.


ALT CSTR missed
ALT CSTR matched

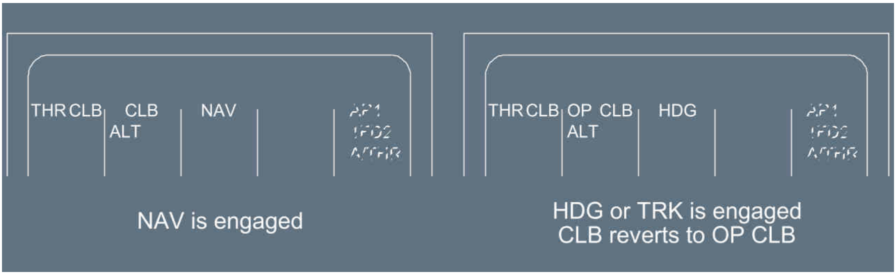
SPEED CONSTRAINT

CHECK the SPD CSTR predictions on the MCDU.

A magenta or amber star (*) indicates that the aircraft will match or miss the constraint.
If the aircraft is to miss the constraint by more than 10 kt, the MCDU scratchpad displays "SPD ERROR AT WPT ---- ".

HDG/TRK MODE ENGAGEMENT

If HDG/TRK is engaged, the guidance does not consider any F-PLN constraint. Therefore if the pilot disengages NAV, CLB mode reverts to OP CLB.


THR CLB
CLB
ALT
NAV
AP1
1FD2
A/THR
NAV is engaged
THR CLB
OP CLB
ALT
HDG
AP1
1FD2
A/THR
HDG or TRK is engaged
CLB reverts to OP CLB

SPEED SELECTION

- **If a specific speed is required :**

  TURN and PULL the SPD selector knob. (This changes the target speed to blue on the PFD speed scale).

Predictions on the F-PLN page assume that the speed remains selected until the next SPD LIM or SPD CSTR, or the next phase, whichever comes first.

IMMEDIATE RETURN TO ORIGIN AIRPORT

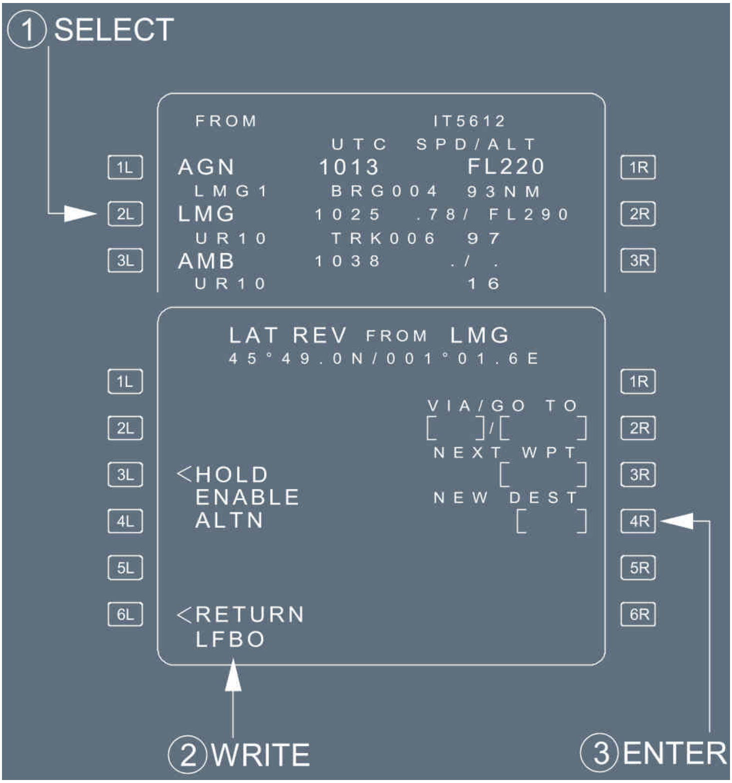
Ident.: PRO-NOR-SRP-01-40-00002478.0001001 / 16 NOV 11
Applicable to: ALL

- **If the SEC F-PLN has been prepared for an immediate return to the airport of origin:**

  ACTIVATE the SEC F-PLN.

  PERFORM a DIR TO the appropriate waypoint.

- **If the SEC F-PLN has not been prepared for an immediate return to the airport of origin:**



```
FROM              IT5612
          UTC     SPD/ALT
AGN       1013      FL220
 LMG1     BRG004   93NM
LMG       1025    .78/ FL290
 UR10     TRK006   97
AMB       1038       ./  .
 UR10               16

   LAT REV FROM LMG
   45°49.0N/001°01.6E
                   VIA/GO TO
                   [  ]/[    ]
                    NEXT WPT
                       [    ]
<HOLD               NEW DEST
 ENABLE                 [   ]
 ALTN

<RETURN
 LFBO
```

PERFORM a lateral revision at TO waypoint

ENTER the departure airport ident in the NEW DEST field and INSERT the temporary flight plan.

PERFORM a lateral revision at the new destination

SELECT : APPR – STAR – VIA – TRANS and INSERT

■ **When cleared to divert:**

PERFORM a DIR TO the suitable waypoint.

ENTER QNH, WIND, MDA/MDH, LDG CONF.

CHECK RAD NAV page.

Cruise

REACHING CRUISE FLIGHT LEVEL

Ident.: PRO-NOR-SRP-01-50-00002479.0001001 / 16 SEP 14
Applicable to: ALL

Upon reaching the cruise flight level, the pilot should be sure that the FMA displays “ALT CRZ” in its second column, which ensures that the aircraft is at CRZ FL (CRZ MACH, predictions valid, soft N1 (EPR) available).

- **If the FMA does not display ALT CRZ at the assigned FL (as may occur when the ATC-assigned FL is lower than the preplanned FL selected initially) :**

  PRESS the [PROG] key.

  ENTER the current cruise flight level.

  Note: *If the current cruise flight level is above the preplanned FL, selecting the FCU updates it automatically.*

- **If the pilot selected the speed target during the climb phase and planned to use ECON MACH for the cruise phase,** "SET MANAGED SPEED" or "CHECK SPEED MODE" appear on the PFD and MCDU as a reminder.

  PRESS the FCU speed selector knob to activate the managed Mach/speed.

MONITORING THE NAVIGATION ACCURACY

Applicable to: ALL

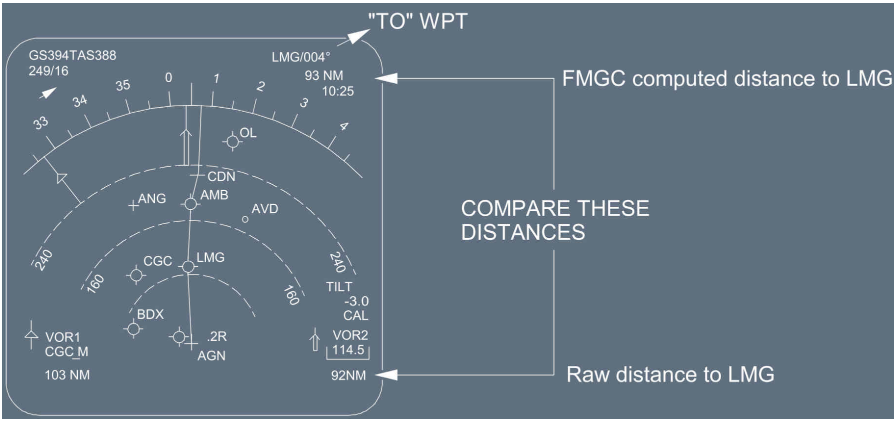
Ident.: PRO-NOR-SRP-01-50-A-00002480.0001001 / 21 MAR 17

GENERAL

On aircraft equipped with GPS PRIMARY, the navigation accuracy check is not required as long as GPS PRIMARY ◁ is available.
Otherwise, navigation accuracy shall be checked periodically in cruise.
The PROG page displays an estimated accuracy as being high or low (center of sixth line). “HIGH” means that the FMGES estimates the FM position accurate enough to meet the EN ROUTE criteria.
“LOW” means that the pilot must compare raw data from tuned navaids with corresponding data computed by FM and shown on the ND or MCDU PROG page. The appearance of the message “NAV ACCUR DOWNGRAD” on the MCDU calls for a similar crosscheck.

Note: *The pilot should make such a comparison periodically, even if the PROG page is displaying "HIGH" and navaids are available : this allows him to quantify the FM position error.*

The method for checking the accuracy is explained in the SOP (*Refer to DSC-22_20-20-20 Estimated Position Uncertainty*).
A quick check is explained here below when the TO waypoint is a DME type. (VOR/DME or DME or VOR/TAC or TAC).

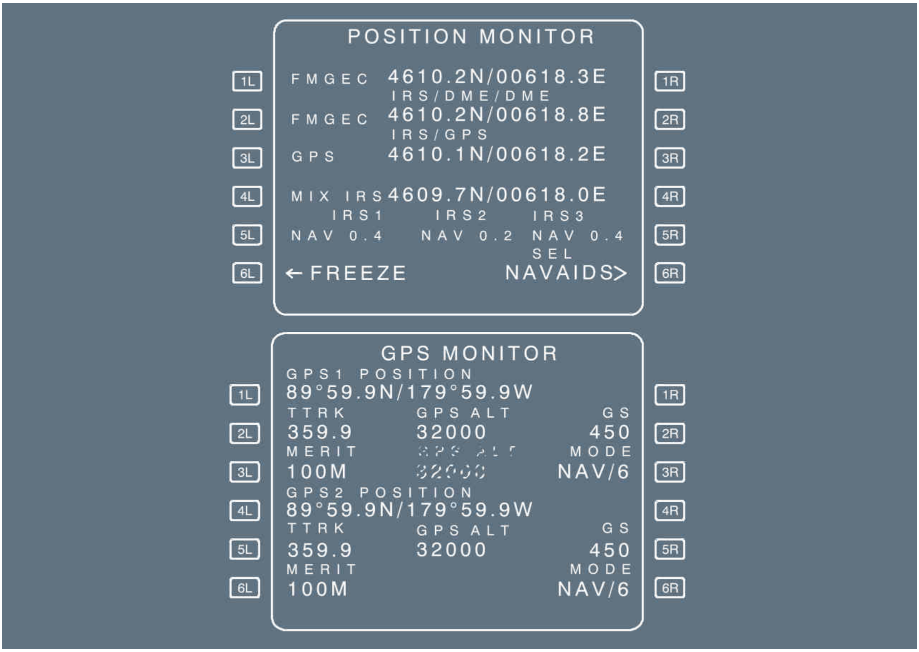

"TO" WPT
GS394TAS388
249/16
LMG/004°
93 NM
10:25
FMGC computed distance to LMG
33
34
35
0
1
2
3
4
OL
CDN
ANG
AMB
AVD
COMPARE THESE DISTANCES
240
CGC
LMG
240
160
160
TILT
-3.0
CAL
BDX
VOR1
CGC M
.2R
AGN
VOR2
114.5
103 NM
92NM
Raw distance to LMG

Ident.: PRO-NOR-SRP-01-50-A-00002481.0003001 / 29 JUN 16

If the MCDU or the ECAM displays one of the following messages:
IRS ONLY NAVIGATION (10 min IRS NAV mode, en route) on the MCDU
FMS 1/2 POS DIFF (5 NM POS difference between FMs) on the MCDU
GPS PRIMARY LOST (FM-IRS threshold function of Δt) on the MCDU
CHECK IRS X/FM POS (FM-IRS threshold function of Δt) on the MCDU
FM/IRS POS DISAGREE (FM-IRS threshold function of Δt) on the ECAM
FM/GPS DISAGREE (> 0.5 NM)
NAV ACCUR DOWNGRAD (EPE > required RNP)
or, if there is a discrepancy between the raw data position and the FM position:

PRESS the [DATA] key on MCDU.
SELECT the POSITION MONITOR page.
SELECT "FREEZE".

On the other MCDU: Select the GPS MONITOR page.



```
          POSITION MONITOR
FMGEC    4610.2N/00618.3E
           IRS/DME/DME
FMGEC    4610.2N/00618.8E
           IRS/GPS
GPS      4610.1N/00618.2E

MIX IRS  4609.7N/00618.0E
    IRS1        IRS2       IRS3
NAV 0.4      NAV 0.2    NAV 0.4
                           SEL
←FREEZE                NAVAIDS>
```

```
          GPS MONITOR
GPS1 POSITION
89°59.9N/179°59.9W
TTRK         GPS ALT          GS
359.9        32000           450
MERIT        GPS ALT        MODE
100M         32000         NAV/6
GPS2 POSITION
89°59.9N/179°59.9W
TTRK         GPS ALT          GS
359.9        32000           450
MERIT                       MODE
100M                       NAV/6
```

MONITORING THE FUEL PREDICTIONS

Ident.: PRO-NOR-SRP-01-50-00002482.0001001 / 09 OCT 12

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The F-PLN page and FUEL PRED pages display fuel and time predictions. These predictions are meaningful if the flight plan and the entered winds are accurate enough.

PROCEDURE

UPDATE the F-PLN to show accurate predictions.
Periodically CHECK the wind on the F-PLN B page, and update it when the current wind is significantly different.
Monitor the fuel by checking:

- *Estimated fuel on board (EFOB) at destination (F-PLN page)*
- *EFOB at alternate and extra fuel (FUEL PRED page)*

- **If the extra fuel is negative, modify successively the following data until the extra fuel becomes null or positive:**

  CHECK current cruise flight level versus the optimum level (OPT FL)

  If advisable, REQUEST reassignment to the OPT FL (or OPT FL +2 000)

  Decrease the cost index down to zero if necessary (MIN FUEL). If the extra fuel is positive, set CI = LRC.

  SELECT another ALTN on the ALTN page and CHECK whether or not XTRA FUEL becomes positive.

  Continue to check different alternates until you find one for which XTRA FUEL is null or positive.

- **When an alternate is not necessary, you may select “NO ALTN” option:**

  CHECK the required conditions (weather, runways, etc.) for NO ALTN.

  SELECT “NO ALTN” on the ALTN selection page.

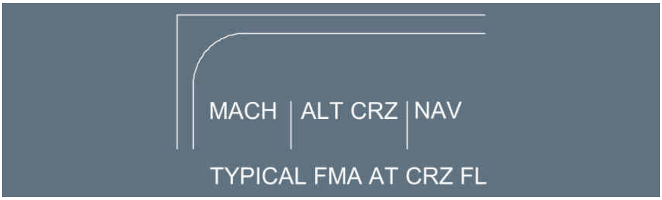
  ADJUST FINAL TIME on the FUEL PRED page.

  CHECK XTRA FUEL.

The pilot must ensure that the aircraft flies the cruise flight level entered on the PROG page. Then, the aircraft will:

- Fly at ECON CRZ MACH.
- Benefit from the A/THR SOFT mode.
- Present accurate predictions.

This is displayed on the Flight Mode Annunciator (FMA):



MONITORING THE FUEL PREDICTIONS

Ident.: PRO-NOR-SRP-01-50-00002482.0004001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

The F-PLN page and FUEL PRED pages display fuel and time predictions throughout the flight. These predictions are meaningful if the lateral and vertical flight plan, and the entered winds are kept accurate enough as the flight progresses.

PROCEDURE

In addition to the Fuel Management procedure described in the SOPs (*Refer to PRO-NOR-SOP-15 Cruise - Flight Progress*), periodically apply the following actions :

KEEP ACCURATE FMS predictions

Periodically UPDATE the F-PLN elements (F-PLN waypoints, step altitudes, predicted winds).

CHECK the MIN DEST FOB value on the FUEL PRED page

The MIN DEST FOB value is computed by the FMS and by default it is equal to ALTN + FINAL. ALTN, FINAL and MIN DEST FOB can be modified by the flight crew. A the beginning of the CRZ phase, and/or after any change of destination or alternate airport, check that the MIN DEST FOB value is meaningful. Otherwise, update the MIN DEST FOB fuel value, as appropriate.

CHECK the DEST EFOB value on the F-PLN or FUEL PRED page.

MONITOR the EFOB at destination on the F-PLN or FUEL PRED page. If necessary, ADAPT the flight strategy.

"DEST EFOB BELOW MIN" MESSAGE

If the predicted EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page:
- The destination EFOB turns to amber on the F-PLN ad FUEL PRED page, PERF (CLB, CRZ, DES) pages, and REPORT page.
- The “DEST EFOB BELOW MIN” amber message is displayed on the MCDU scratchpad, after 2 min (if in CRZ or DES phase).

Note: *If the flight crew has cleared the “DEST EFOB BELOW MIN” message, and if the predicted EFOB at destination is still less than the MIN DEST FOB value, the “DEST EFOB BELOW MIN” message will appear again at the beginning of the descent phase.*

PROCEDURE

● **If the "DEST EFOB BELOW MIN" message is triggered on the MCDU:**

CHECK the DEST EFOB value on the F-PLN or FUEL PRED page,

CHECK the hypothesis used by the FMS to compute the fuel predictions,

Check that the F-PLN elements (F-PLN waypoints, step altitudes, predicted winds) are up-to-date, to ensure that the FMS predictions are accurate.
Check that the MIN DEST FOB fuel value is meaningful and corresponds to the planned fuel strategy.

ADAPT the flight strategy.

ENTERING A STEP CLIMB OR A STEP DESCENT

Ident.: PRO-NOR-SRP-01-50-00002483.0001001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

The flight crew may use the STEP ALTS page to enter up to four geographic step points or one optimal step (computed by the FMGES) at any waypoint of the cruise.

PROCEDURE

PRESS the PERF key.
SELECT the STEP ALTS prompt.

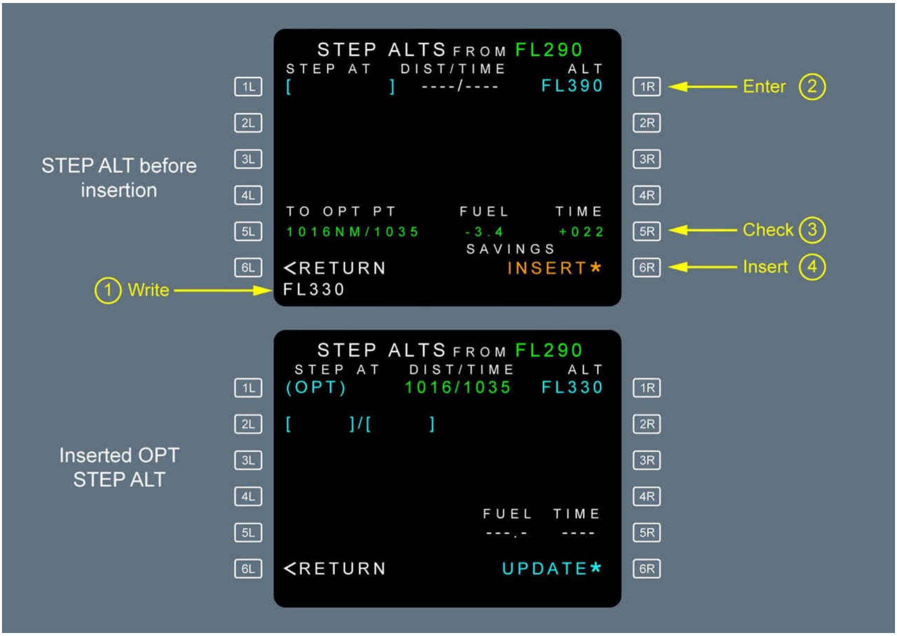
L2 *The PERF PAGE displays this prompt in cruise phase. The flight crew may also call up the STEP ALTS page using a vertical revision at any cruise waypoint.*

L1 ENTERING AN OPTIMAL STEP (ONLY STEP CLIMBS)

WRITE a step altitude, or FL in the scratchpad.
ENTER it in the [1R] field.
CHECK the FUEL and TIME SAVINGS, and predictions on the 5L and 5R fields.
INSERT it, if adequate.

L2 *After insertion, the optimum step climb is only updated when the flight crew presses the UPDATE prompt [6R].*
The ND shows symbols for the start of climb (S/C) and the top of climb (T/C). The MCDU shows the associated pseudo-waypoints.
It is possible to convert an optimum step to a geographic step by overwriting the [1L] field (see geographic step).

L1
- **When reaching the step climb pseudo-waypoint:**
  REQUEST climb clearance.
  ADJUST the FCU altitude to the STEP ALT, and PUSH.


STEP ALT before insertion
STEP ALTS FROM FL290
STEP AT DIST/TIME ALT
[ ] ----/---- FL390
TO OPT PT FUEL TIME
1016NM/1035 -3.4 +022
SAVINGS
<RETURN INSERT*
FL330
① Write
Enter ②
Check ③
Insert ④
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
Inserted OPT STEP ALT
STEP ALTS FROM FL290
STEP AT DIST/TIME ALT
(OPT) 1016/1035 FL330
[ ]/[ ]
FUEL TIME
---.- ----
<RETURN UPDATE*

ENTERING A GEOGRAPHIC STEP

WRITE a step altitude into the scratchpad.

L2 *The format is:*

- *Place/altitude (or FL)*
- *Place/distance/altitude (or FL).*

The place must be along the track.

L1 ENTER it in [1L] to [4L] field.

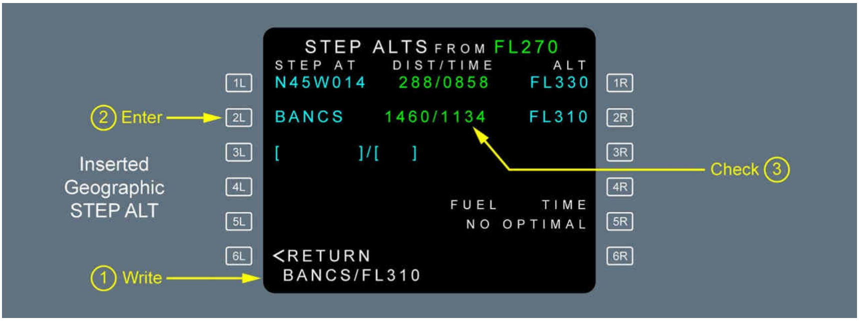
L2 *It is possible to independently modify either the location or the altitude of an existing step altitude. It is not possible to modify with a single entry both the location and the altitude:An entry “place/xxx” will be taken by the system as an along track offset of xxx nautical miles.*

L1 CHECK the predictions (distance, time).

- **When reaching the step climb or descent pseudo-waypoint:**

  REQUEST climb or descent clearance.

  ADJUST the FCU altitude to the STEP ALT, and PUSH.



```
STEP ALTS FROM FL270
STEP AT      DIST/TIME      ALT
N45W014      288/0858       FL330
BANCS        1460/1134      FL310
[         ]/[   ]
                    FUEL      TIME
                    NO OPTIMAL
<RETURN
 BANCS/FL310
```

② Enter

Inserted Geographic STEP ALT

① Write

Check ③

The DIST/TIME field may display the following messages:

- ABOVE MAX if the step altitude exceeds the MAX ALT
- IGNORED if the step end point is less than 50 NM from the top of descent
- STEP NOW when the aircraft is within 20 NM of the step point. If the aircraft overflies the step pseudo-waypoint without commencing a climb or a descent, the system deletes the step from the vertical F-PLN automatically (a “STEP DELETED” message is displayed on the MCDU scratchpad), and recomputes the predictions. The step is not deleted if the FCU altitude is moved only partially towards the step altitude. The flight phase remains “cruise” whenever a step is initiated.

Note: *For an altitude restriction defined at a waypoint less than 50 NM before the top of descent and lower than the CRZ FL, it is recommended to enter an altitude constraint rather than a step.*

ENTERING A STEP CLIMB OR A STEP DESCENT

Ident.: PRO-NOR-SRP-01-50-00002483.0004001 / 01 OCT 12
Applicable to: LV-KHT, LV-KHU

The crew may use the STEP ALTS page to enter up to four geographic step points or one optimal step (computed by the FMGES) at any waypoint of the cruise.

PROCEDURE

PRESS the PERF key.
SELECT the “STEP ALTS” prompt.

The PERF PAGE displays this prompt in cruise phase. The crew may also call up the STEP ALTS page using a vertical revision at any cruise waypoint.

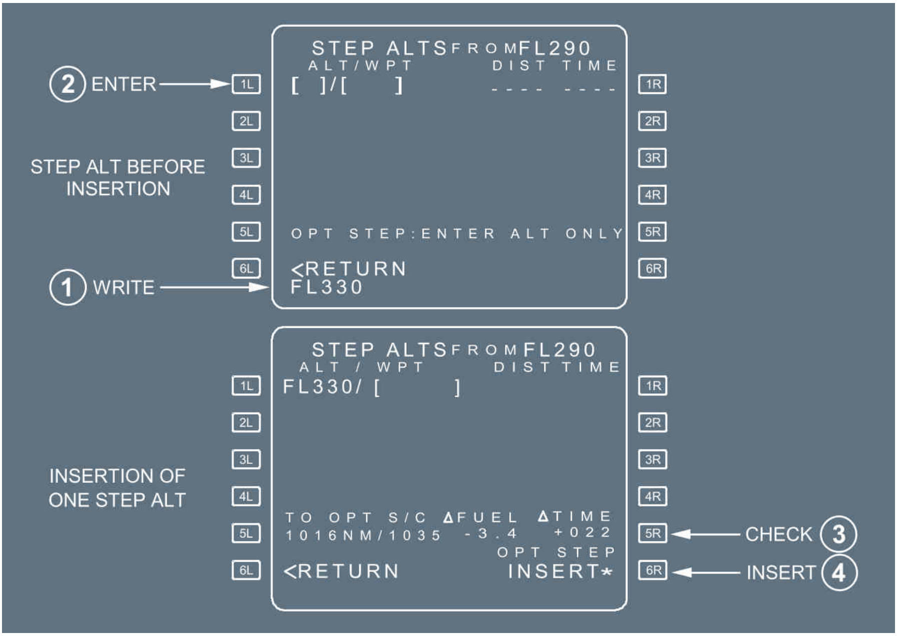
ENTERING AN OPTIMAL STEP (ONLY STEP CLIMBS)

WRITE a step altitude, or FL in the scratchpad.
ENTER it in the [1R] field.

CHECK the FUEL and TIME SAVINGS, and predictions on the 5L and 5R fields
INSERT it, if adequate.

After insertion, the optimum step climb is only updated when the pilot presses the UPDATE prompt [6R].
The ND shows symbols for the start of climb (S/C) and the top of climb (T/C). The MCDU shows the associated pseudo-waypoints.
It is possible to convert an optimum step to a geographic step by overwriting the [1L] field (see geographic step).

- **When reaching the step climb pseudo-waypoint :**
  REQUEST climb clearance.
  ADJUST the FCU altitude to the STEP ALT, and PUSH.



STEP ALTS FROM FL290
ALT/WPT DIST TIME
[ ]/[ ] ---- ----
OPT STEP:ENTER ALT ONLY
<RETURN
FL330

STEP ALTS FROM FL290
ALT / WPT DIST TIME
FL330/ [ ]
TO OPT S/C ΔFUEL ΔTIME
1016NM/1035 -3.4 +022
OPT STEP
<RETURN INSERT*

ENTERING A GEOGRAPHIC STEP

WRITE a step altitude and waypoint into the scratchpad.

The format is:
- *Altitude (or FL)/waypoint (Ex: FL 350/BERAD)*
- *Altitude (or FL)/waypoint/distance (Ex: FL 350/BERAD/-20)*

The waypoint must be in the flight plan.

ENTER it in [1L] to [4L] field.

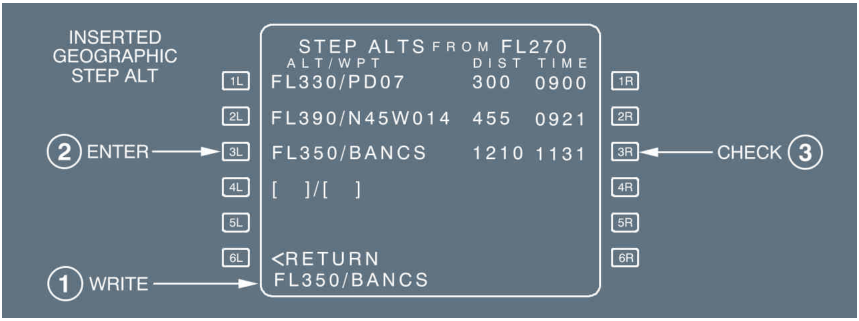
It is possible to independently modify either the location or the altitude of an existing step altitude. It is not possible to modify with a single entry both the location and the altitude : An entry "place/xxx" will be taken by the system as an along track offset of xxx nautical miles.

CHECK the predictions (distance, time).

- **When reaching the step climb or descent pseudo-waypoint :**

  REQUEST climb or descent clearance.

  ADJUST the FCU altitude to the STEP ALT, and PUSH the FCU knob.



```
   STEP ALTS FROM FL270
  ALT/WPT          DIST  TIME
FL330/PD07         300   0900

FL390/N45W014      455   0921

FL350/BANCS       1210   1131

[   ]/[   ]



<RETURN
FL350/BANCS
```

The DIST/TIME field may display the following messages:

- ABOVE MAX if the step altitude exceeds the MAX ALT.
- IGNORED if the step end point is less than 50 NM from the top of descent or if the step climb is located prior to the top of climb or after the top of descent.
- STEP AHEAD when the aircraft is within 20 NM of the step point. If the aircraft overflies the step pseudo-waypoint without commencing a climb or a descent, the system deletes the step from the vertical F-PLN automatically (a "STEP DELETED" message is displayed on the MCDU scratchpad), and recomputes the predictions. The step is not deleted if the FCU altitude is moved only partially towards the step altitude. The flight phase remains "cruise" whenever a step is initiated.

Note: *For an altitude restriction defined at a waypoint less than 50 NM before the top of descent and lower than the CRZ FL, it is recommended to enter an altitude constraint rather than a step.*

IMMEDIATE CHANGE OF LEVEL IN CRUISE

Ident.: PRO-NOR-SRP-01-50-00002484.0001001 / 15 FEB 11
Applicable to: ALL

- **When the pilot changes his flight level without inserting a step :**
  - **If the FCU-selected altitude is above the previous CRZ FL,** the CRZ FL on the PROG page changes to the new flight level.
  - **If the FCU-selected altitude is lower than the previous CRZ FL and if the distance to DEST is more than 200 NM, the CRZ FL on the PROG page changes.**

    In that case Mach target is managed as follows :
    - At the start of the descent, the Mach target is the managed Mach number at the initial cruise flight level.
    - When the aircraft reaches the new flight level, the Mach target switches either to the Mach number for the lower CRZ FL, or to the speed for the lower CRZ FL if the aircraft reaches the crossover altitude. This logic prevents the aircraft from exceeding VMO during descent.
  - **If the FCU-selected altitude is lower than the previous CRZ FL and the aircraft is within 200 NM of its destination, the system activates the descent phase .** The pilot may reactivate the cruise phase by entering a new cruise flight level in the PROG PAGE

PREPARATION FOR DESCENT AND APPROACH

Ident.: PRO-NOR-SRP-01-50-B-00002485.0001001 / 15 FEB 11
Applicable to: ALL

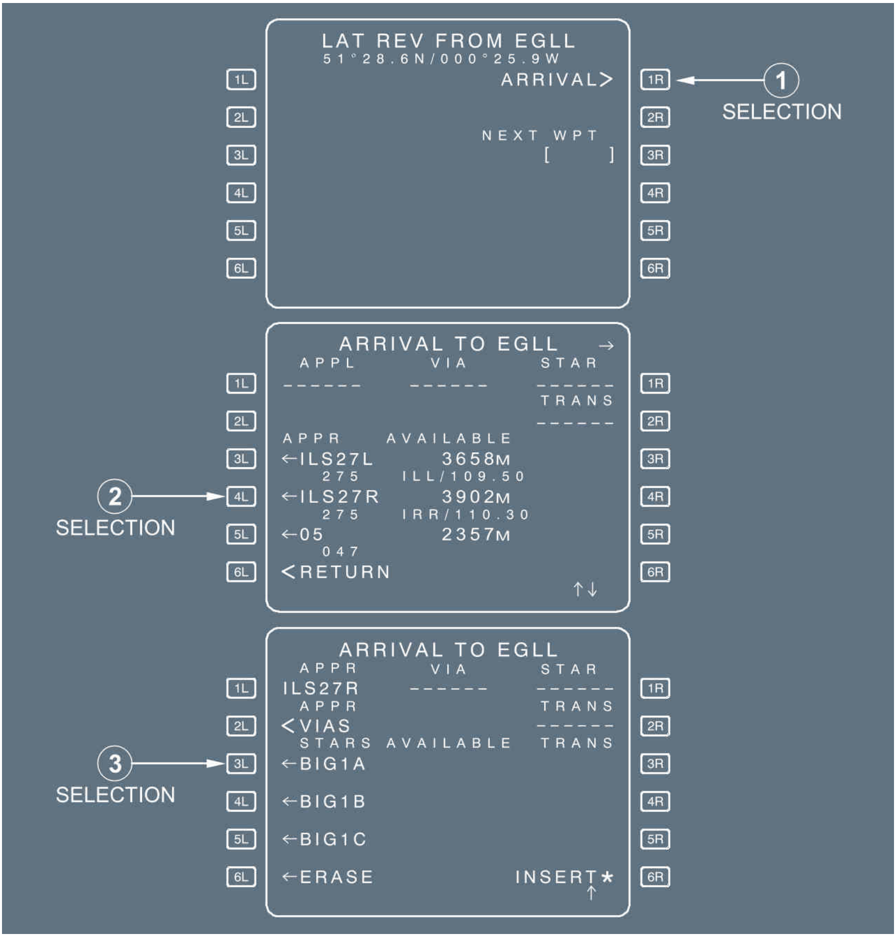
GENERAL

The preparation for descent and approach consists of :
- Entering PERF and WIND data
- Defining the lateral and vertical F-PLN
- Checking the tuning (auto or manual) of the appropriate NAVAIDs

After receiving the arrival information, the flight crew should use the following procedure.

Ident.: PRO-NOR-SRP-01-50-B-00002486.0001001 / 09 OCT 12
Applicable to: ALL

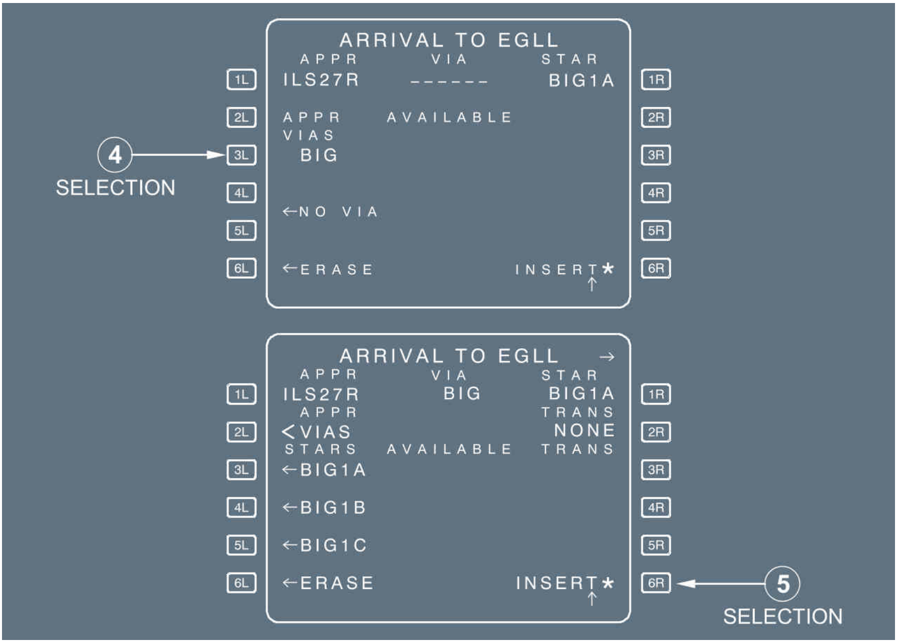
REVISION OF LATERAL F-PLN


1
SELECTION
2
SELECTION
3
SELECTION
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
LAT REV FROM EGLL
51°28.6N/000°25.9W
                  ARRIVAL>

                NEXT WPT
                [       ]
```

```
ARRIVAL TO EGLL          →
 APPL       VIA       STAR
------     ------    ------
                      TRANS
                     ------
APPR      AVAILABLE
←ILS27L       3658M
  275    ILL/109.50
←ILS27R       3902M
  275    IRR/110.30
←05           2357M
  047
<RETURN
                      ↑↓
```

```
ARRIVAL TO EGLL
 APPR       VIA       STAR
ILS27R     ------    ------
 APPR                 TRANS
<VIAS                ------
 STARS  AVAILABLE     TRANS
←BIG1A

←BIG1B

←BIG1C

←ERASE             INSERT*
                        ↑
```


ARRIVAL TO EGLL
APPR
VIA
STAR
ILS27R

BIG1A
APPR AVAILABLE
VIAS
BIG
←NO VIA
←ERASE
INSERT*
↑
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
4
SELECTION
ARRIVAL TO EGLL →
APPR
VIA
STAR
ILS27R
BIG
BIG1A
APPR
TRANS
<VIAS
NONE
STARS
AVAILABLE
TRANS
←BIG1A
←BIG1B
←BIG1C
←ERASE
INSERT*
↑
5
SELECTION

PERFORM a lateral revision at destination
SELECT ARRIVAL
SELECT an APPROACH, a STAR, a TRANSITION, a VIA.

When the flight crew selects successive items, the page are automatically sequenced. But pressing the [→] key brings up the APPR and STAR page successively.

CHECK the temporary revision including the missed approach.
INSERT the temporary revision, [6R] key.

Ident.: PRO-NOR-SRP-01-50-B-00002487.0001001 / 09 OCT 12
Applicable to: ALL

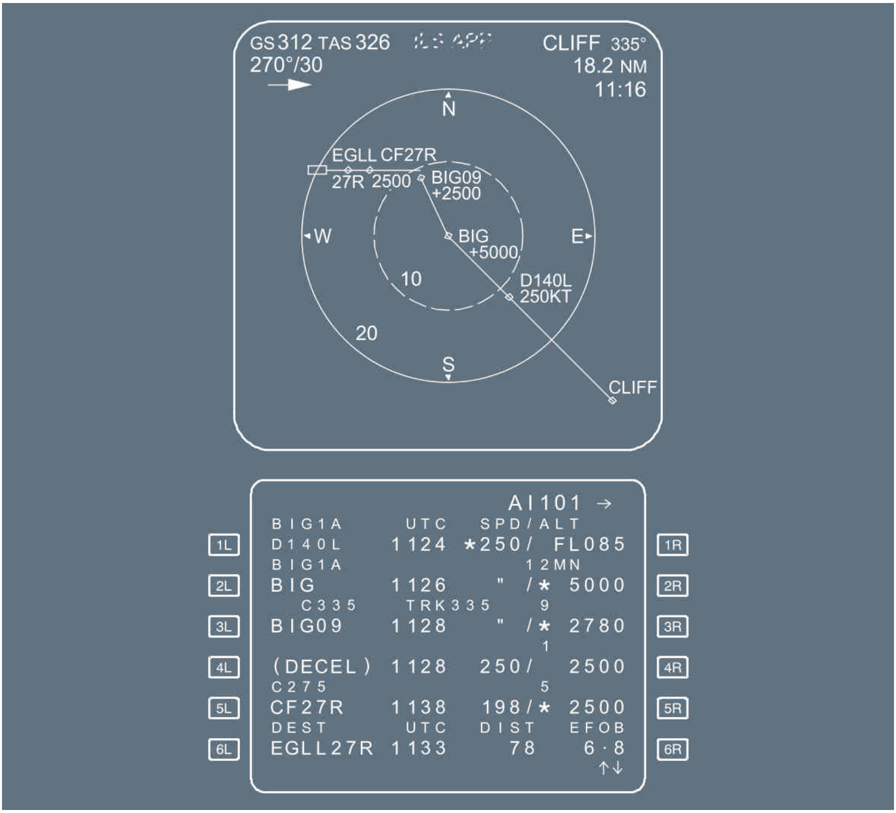
REVISION OF VERTICAL FLIGHT PLAN

CHECK the speed and altitude constraints as displayed on the ND. (Use the CSTR pb).
ENTER any additional speed or altitude constraints using the vertical revision page.

In order not to be too fast when commencing approach, you may insert a speed constraint at the FAF (Final Approach Fix).
When all computations are completed:

REVIEW the flight plan using the approach chart.

When the destination runway changes and if the previously selected STAR is compatible with the new runway, the system selects it automatically in the temporary F-PLN. If the flight crew has entered any revision or constraint on this STAR, it will not be transferred. The flight crew must reenter it in order to retain it for this approach.


GS 312 TAS 326
ILS APP
270°/30
CLIFF 335°
18.2 NM
11:16
N
EGLL CF27R
27R 2500
BIG09
+2500
W
BIG
+5000
E
10
D140L
250KT
20
S
CLIFF
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

```
                              AI101 →
 BIG1A         UTC    SPD/ALT
 D140L        1124  *250/  FL085
 BIG1A                  12MN
 BIG          1126     "  /*  5000
    C335        TRK335       9
 BIG09        1128     "  /*  2780
                             1
 (DECEL)      1128    250/    2500
 C275                        5
 CF27R        1138    198/*   2500
 DEST          UTC    DIST    EFOB
 EGLL27R      1133      78     6.8
                                ↑↓
```

Ident.: PRO-NOR-SRP-01-50-B-00002488.0001001 / 16 NOV 11
Applicable to: ALL

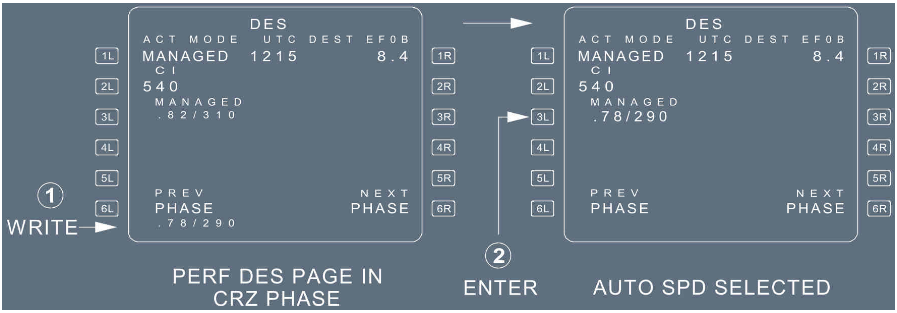
ENTERING THE WINDS FOR DESCENT

Refer to DSC / 22_20 Auto Flight - Flight Management / 30 Flight Planning / 20 Vertical Functions / ENTERING THE DESCENT WINDS.

Ident.: PRO-NOR-SRP-01-50-B-00002489.0001001 / 15 FEB 11
Applicable to: ALL

PRESELECTING A MANAGED SPEED/MACH

As long as the descent phase is not active, the PERF DES page may either be used to select a speed, or a Mach number, or both, to replace the optimum descent speed.
The Flight Guidance Computer then uses the entered speed, instead of the optimum speed for computing the descent profile.
When the system switches to the descent phase, it sets the MANAGED target speed to the entered speed. From there, the speed may only be modified by using the FCU selector knob. Once in descent phase, the pilot cannot modify the MANAGED speed again.


DES
ACT MODE
UTC DEST
EFOB
MANAGED
1215
8.4
CI
540
MANAGED
.82/310
PREV
PHASE
.78/290
NEXT
PHASE
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
①
WRITE
PERF DES PAGE IN
CRZ PHASE
②
ENTER
DES
ACT MODE
UTC DEST
EFOB
MANAGED
1215
8.4
CI
540
MANAGED
.78/290
PREV
PHASE
NEXT
PHASE
AUTO SPD SELECTED

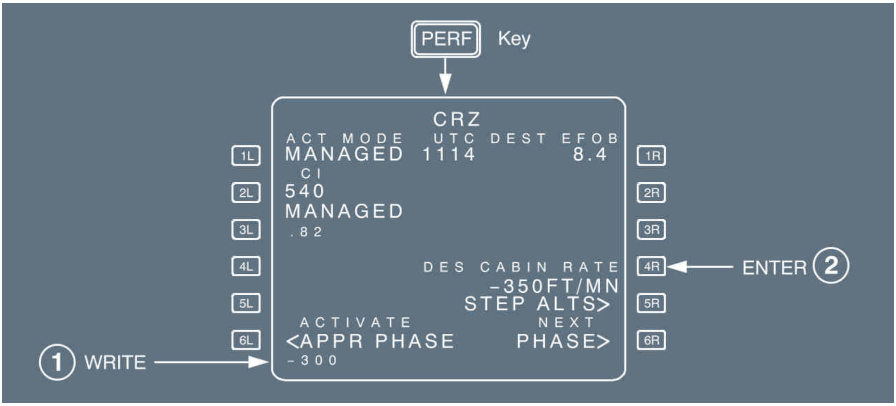
PROCEDURE

PRESS the PERF key on the MCDU.
SELECT the “NEXT PHASE” prompt.
WRITE the descent speed into the scratchpad and ENTER it.

The 3L field displays the imposed managed speed value.

Ident.: PRO-NOR-SRP-01-50-B-00002490.0001001 / 16 MAY 12
Applicable to: ALL

MODIFICATION OF THE CABIN RATE


PERF Key
CRZ
ACT MODE
UTC DEST EFOB
MANAGED
1114
8.4
CI
540
MANAGED
.82
DES CABIN RATE
-350FT/MN
STEP ALTS>
ACTIVATE
<APPR PHASE
NEXT
PHASE>
-300
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
ENTER ②
① WRITE

PROCEDURE

PRESS the PERF key on MCDU
WRITE the new cabin rate into the scratchpad
ENTER it in the [4R] field.

Ident.: PRO-NOR-SRP-01-50-B-00002491.0001001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

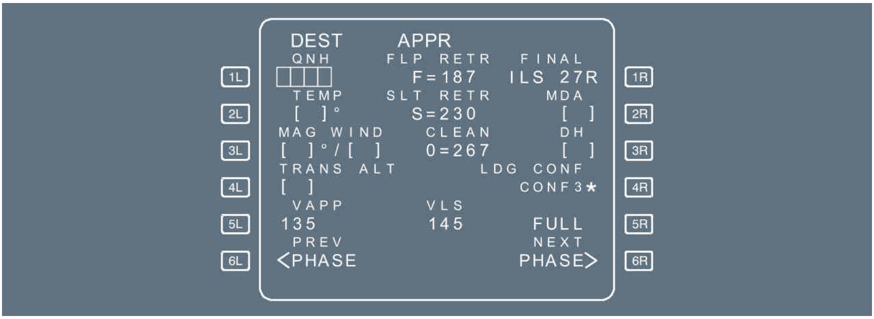
ENTERING THE APPROACH DATA

From PERF DES page, SELECT “NEXT PHASE” [6R] key to display the APPR page.
ENTER QNH, TEMP, WIND at destination (magnetic or true North reference depending on the airport’s reference). MDA/MDH or DH

(The PFD displays the MDA/MDH or DH only when the distance to destination is less than 250 NM).

CHECK and, if necessary, MODIFY

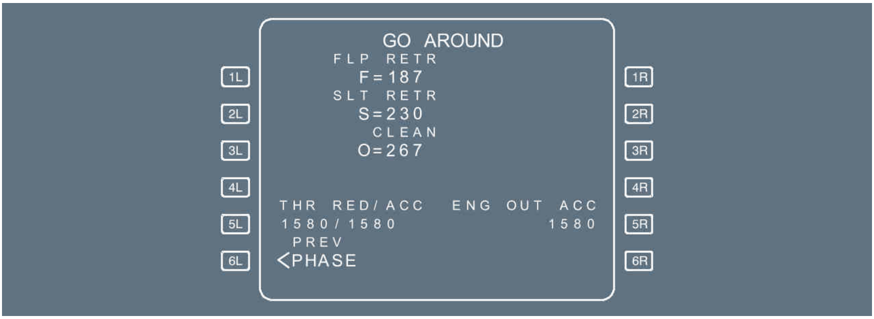
- *LDG CONF (landing configuration)*
- *Vapp (the FM-computed value may be modified)*
- *TRANS ALT (transition altitude)*



```
   DEST       APPR
   QNH      FLP RETR    FINAL
□□□□        F=187     ILS 27R
   TEMP     SLT RETR     MDA
  [ ]°       S=230       [ ]
 MAG WIND    CLEAN       DH
[ ]°/[ ]     O=267       [ ]
TRANS ALT            LDG CONF
[ ]                    CONF3*
  VAPP        VLS
135           145       FULL
  PREV                  NEXT
<PHASE                 PHASE>
```

The scratchpad displays “ENTER DEST DATA” if the approach page is not completed when the aircraft is 180 NM from destination.

SELECT “NEXT PHASE” in order to display the GO AROUND page.
CHECK and, if necessary, MODIFY the THR RED ALT and ACC ALT.



```
            GO AROUND
         FLP RETR
           F=187
         SLT RETR
           S=230
             CLEAN
           O=267


THR RED/ACC     ENG OUT ACC
1580/1580              1580
  PREV
<PHASE
```

Ident.: PRO-NOR-SRP-01-50-B-00002491.0007001 / 10 MAR 20
Applicable to: LV-KHT, LV-KHU

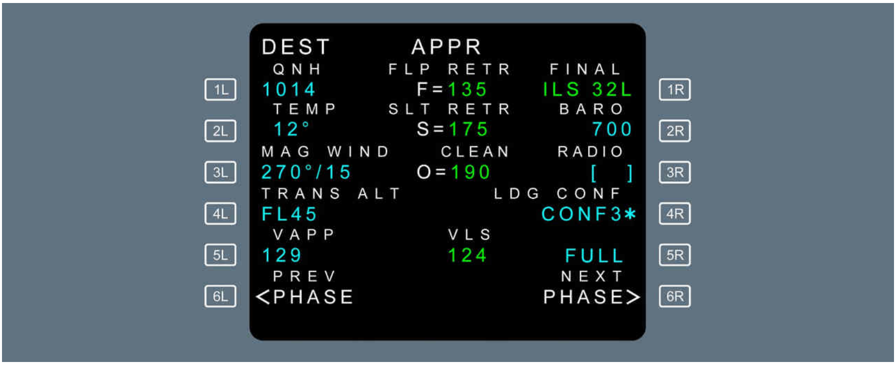
ENTERING THE APPROACH DATA

From PERF DES page, SELECT “NEXT PHASE” [6R] key to display the APPR page.
ENTER QNH, TEMP, WIND at destination (magnetic North reference), minimum in the RADIO or BARO fields.

(The PFD displays the BARO or RADIO minimum value only when the distance to destination is less than 250 NM).

CHECK and, if necessary, MODIFY

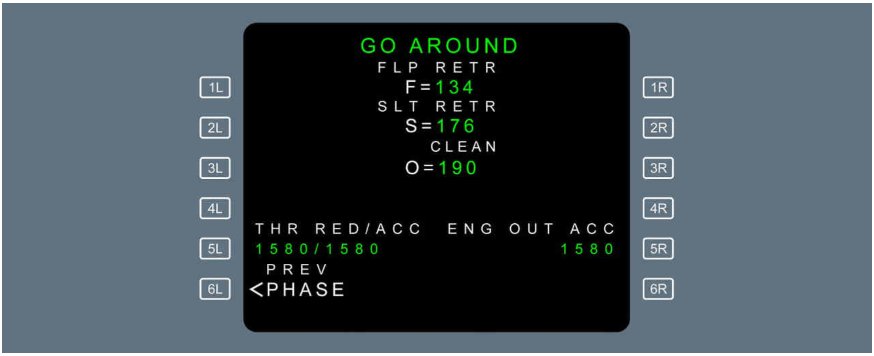
- LDG CONF (landing configuration)
- VAPP (the FM-computed value may be modified)
- TRANS ALT (transition altitude).



```
DEST          APPR
 QNH        FLP RETR      FINAL
1014         F=135      ILS 32L
 TEMP       SLT RETR       BARO
 12°         S=175          700
MAG WIND      CLEAN       RADIO
270°/15      O=190         [  ]
TRANS ALT          LDG CONF
FL45                   CONF3*
 VAPP          VLS
129            124         FULL
 PREV                      NEXT
<PHASE                   PHASE>
```

Note: *The scratchpad displays “ENTER DES DATA” if the PERF APPR page has not been completed when the aircraft is less than 180 NM from destination.*

SELECT "NEXT PHASE" in order to display the GO AROUND page.
CHECK and, if necessary, MODIFY the THR RED ALT and ACC ALT.



```
          GO AROUND
          FLP RETR
           F=134
          SLT RETR
           S=176
             CLEAN
           O=190


THR RED/ACC   ENG OUT ACC
1580/1580            1580
 PREV
<PHASE
```

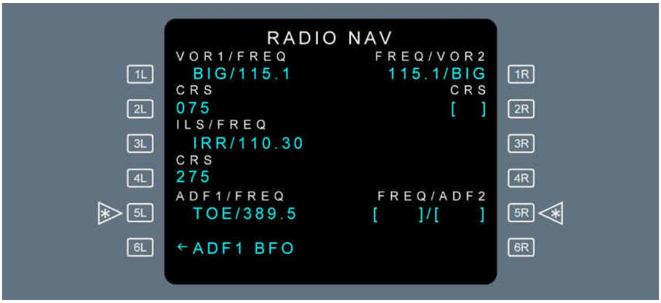
Ident.: PRO-NOR-SRP-01-50-B-00002492.0002001 / 15 NOV 21
Applicable to: ALL

SELECTING THE RADIO NAVAIDS

CHECK, or SELECT, the appropriate NAVAIDS for the approach.

For an ILS / GLS ◁ / SLS ◁ procedure, the ILS / GLS ◁ / SLS ◁ will be autotuned.
NDBs must be entered manually.

Note: *When the destination has a VOR/DME, enter it manually in the VOR field. Enter its identifier in the BRG/DIST field of the PROG page. This allows you to perform a permanent NAV accuracy check.*



```
              RADIO NAV
VOR1/FREQ                 FREQ/VOR2
  BIG/115.1                 115.1/BIG
CRS                             CRS
075                            [  ]
ILS/FREQ
  IRR/110.30
CRS
275
ADF1/FREQ                 FREQ/ADF2
  TOE/389.5               [    ]/[    ]

←ADF1 BFO
```

Ident.: PRO-NOR-SRP-01-50-B-00002493.0001001 / 26 NOV 19
Applicable to: ALL

COST INDEX FOR LONG-RANGE CRUISE

The pilot can use the table on this page to find an approximate value for the cost index for long-range cruise.
This unique cost index allows a specific ± 1 % around the specific range at long-range cruise speed. This cost index is valid for CRZ FL = OPT ALT ± 1 000 ft.

AIRCRAFT	ENGINE	CI LRC	
		kg/min	100 lb/h
A340-200/300	CFM 5C4	50	67
	CFM 5C3	50	67
	CFM 5C2	50	67
A340–500/600	RR 553/556	140	185
A330	GE 1A2/1A3/1A4	40	53
	PW 4168/4164/4168A/4170	30	40
	RR 772/772B/772C/768	40	53
	RR 7000-72	90	119

Intentionally left blank

Descent

DESCENT INITIATION

Ident.: PRO-NOR-SRP-01-60-00002494.0001001 / 16 NOV 11
Applicable to: ALL

The top of descent, displayed on the F-PLN page (T/D) and on the ND (↘), is a position that the system calculates, assuming that the aircraft will begin its descent in DES mode with managed speed, and that the system will guide the aircraft along the descent profile computed with all the vertical F-PLN data (ALT CSTR, MANAGED MACH/SPD, SPD CSTR, SPD LIMIT) to reach VAPP at 1 000 ft AGL.

Note: *The ND does not display the top of descent ↘ when HDG (or TRACK) mode is engaged.*

PROCEDURES

- **When the aircraft reaches the top of descent (T/D) :**

  SELECT the altitude target.

  PUSH the ALT selector knob. DES mode engages.

  CHECK the FMA annunciators.

DESCENT MONITORING

Applicable to: ALL

Ident.: PRO-NOR-SRP-01-60-A-00002495.0002001 / 04 JUN 19

DES MODE ENGAGED

When DES mode is engaged, NAV mode is engaged, and the system takes into account all altitude and speed constraints of the F-PLN.
The key parameter for monitoring the descent is the vertical deviation (VDEV) displayed on the PFD and on the PROG page, which indicates whether the aircraft is on, above, or below the descent profile.

PROCEDURE

SET the ATC cleared altitude on the FCU (considering also what is the safe altitude).

If the lowest safe altitude is higher than the ATC-cleared altitude, check with ATC that this constraint applies.
If it is confirmed, SET the FCU altitude to the safe altitude until it is safe to go to the ATC-cleared altitude.

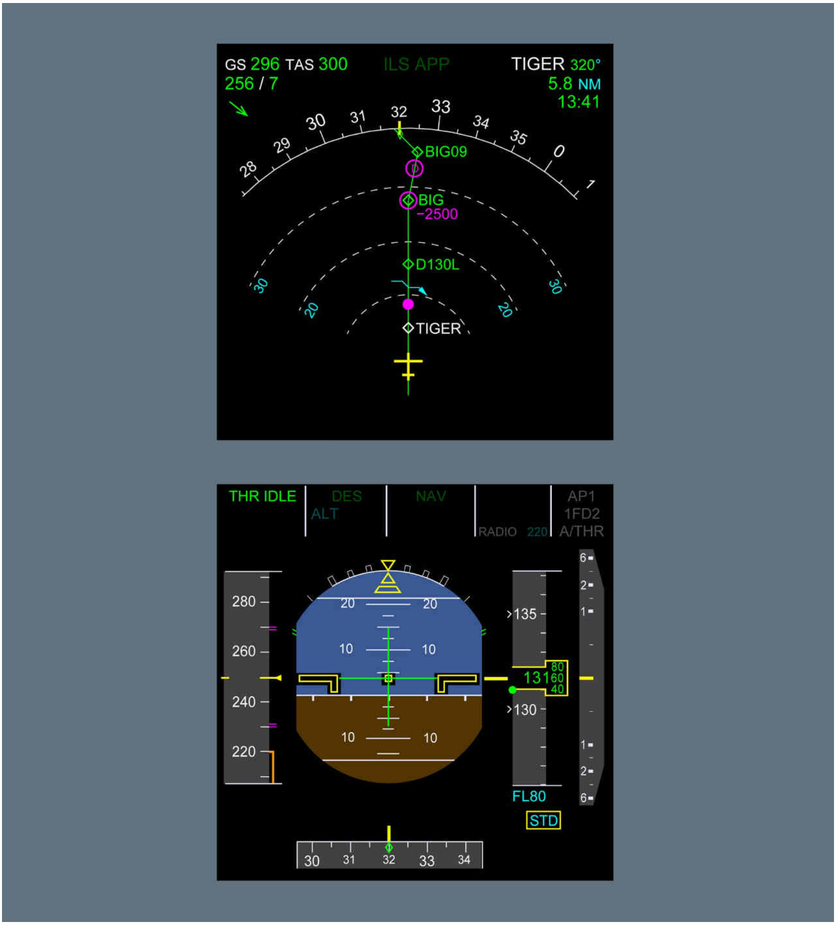
MONITOR the vertical deviation (VDEV) on the PFD and the PROG page.

MONITOR the speed change that occurs when the aircraft reaches a speed change symbol (magenta ball) under managed speed.
MONITOR the (ALT*, ALT CST*, ALT, ALT CST) when the aircraft reaches level symbols.

- **If the aircraft is on the descent profile:**
  The aircraft is considered to be on the vertical profile when it is within 50 ft of it. VDEV is close to zero, and the system predicts that it will match constraints until the aircraft levels off at the next FCU altitude.

  MONITOR the predicted descent point after the next level-off.

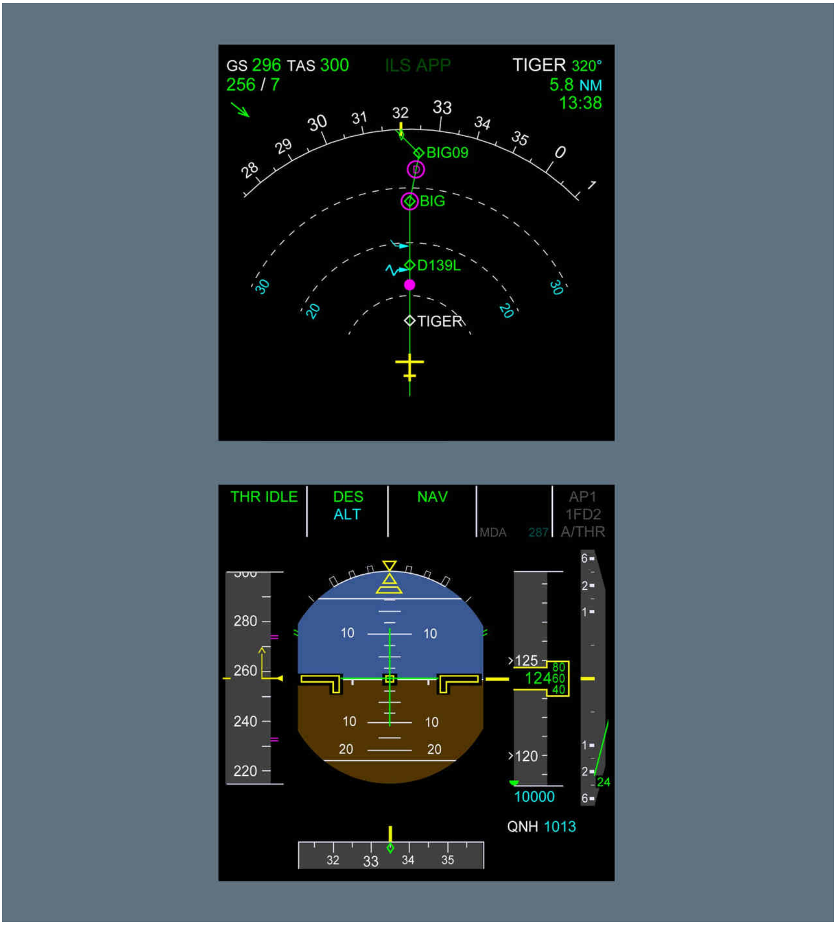
  The autothrust adjusts the thrust for the particular segment. The first FMA column may display THR IDLE or SPEED.

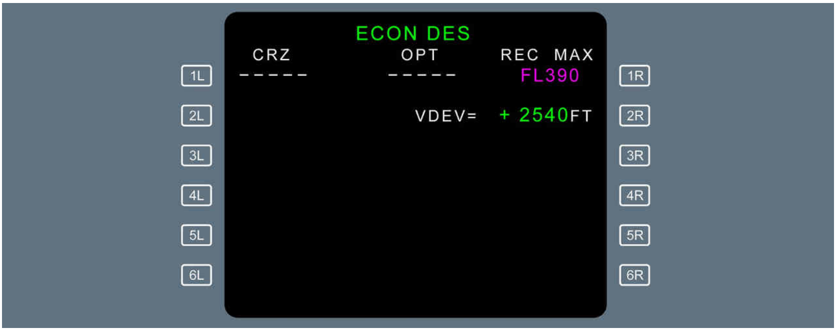

GS 296 TAS 300
256 / 7
ILS APP
TIGER 320°
5.8 NM
13:41
BIG09
BIG
−2500
D130L
TIGER
THR IDLE
DES
ALT
NAV
RADIO 220
AP1
1FD2
A/THR
FL80
STD

- **If the aircraft is above the descent profile:**

  VDEV is down on the PFD and positive on the PROG page.

  The autothrust sets IDLE thrust and the AP increases speed by calling for down elevator. If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.


GS 296 TAS 300
256 / 7
ILS APP
TIGER 320°
5.8 NM
13:38
28
29
30
31
32
33
34
35
0
1
BIG09
BIG
D139L
TIGER
30
20
30
20
THR IDLE
DES
ALT
NAV
MDA
287
AP1
1FD2
A/THR
280
260
240
220
10
10
10
10
20
20
125
12460
80
40
120
10000
QNH 1013
6
2
1
1
2
6
24
32
33
34
35



ECON DES
CRZ OPT REC MAX
----- ----- FL390
VDEV= + 2540FT

PROCEDURE

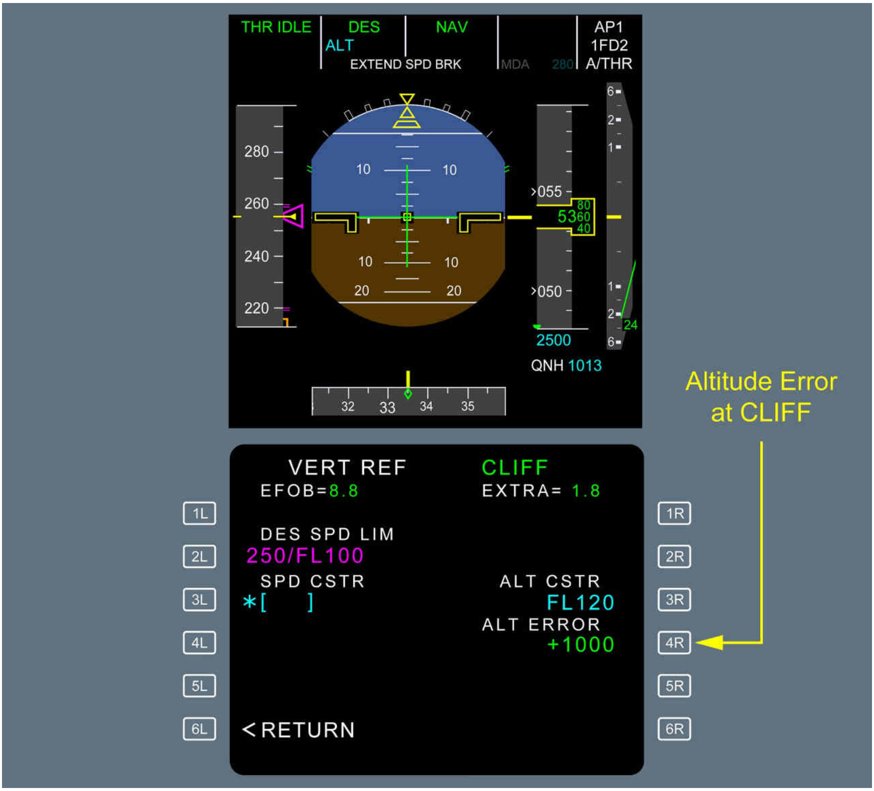
SELECT a descent speed higher than the upper limit when possible.

MONITOR the intercept symbol ↝.

When this symbol reaches the next ALT CSTR waypoint EXTEND SPD BRK appears on the PFD indicating that speedbrakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note: *When DES mode is engaged, the speedbrake extension will not necessarily increase the descent rate. It does so only if the aircraft is above the profile. If the aircraft is on or below the profile: the system will add thrust to keep the aircraft on profile and within the speed target range.*

Note: *With DPO ⊲ , when above the descent profile, the flight crew may have to extend the speed brakes in order to go back on the descent profile.*


THR IDLE
DES
ALT
NAV
AP1
1FD2
A/THR
EXTEND SPD BRK
MDA
280
280
260
240
220
10
10
20
20
>055
5360
80
40
>050
2500
QNH 1013
6
2
1
24
32
33
34
35
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

VERT REF CLIFF
EFOB=8.8 EXTRA= 1.8

DES SPD LIM
250/FL100
SPD CSTR ALT CSTR
*[ ] FL120
ALT ERROR
+1000

<RETURN

Altitude Error at CLIFF

- **If a speed constraint is predicted to be missed:**
  SELECT an appropriate speed.
  RESUME managed speed when the aircraft is back on the descent path.
- **If the aircraft is below the descent profile:**
  VDEV is up on the PFD and negative on the PROG page. The system maintains the target speed (managed or selected speed).

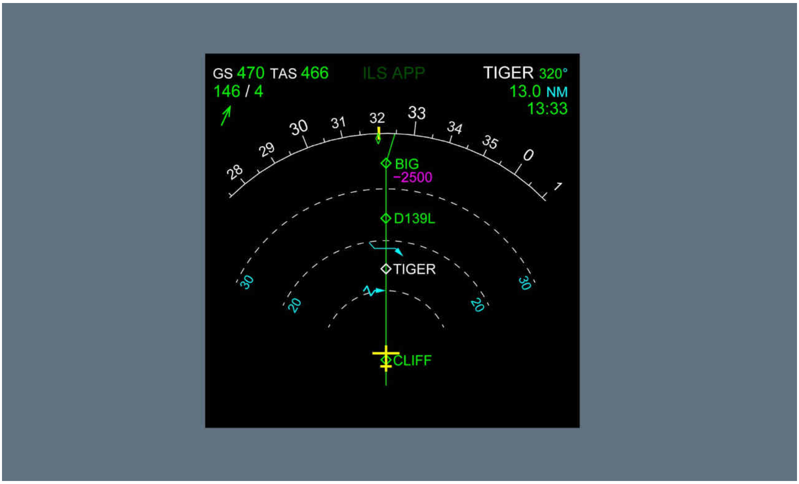
  MONITOR the intercept symbol ([↝]) on the ND, and any leveling off at the next ALT CSTR.

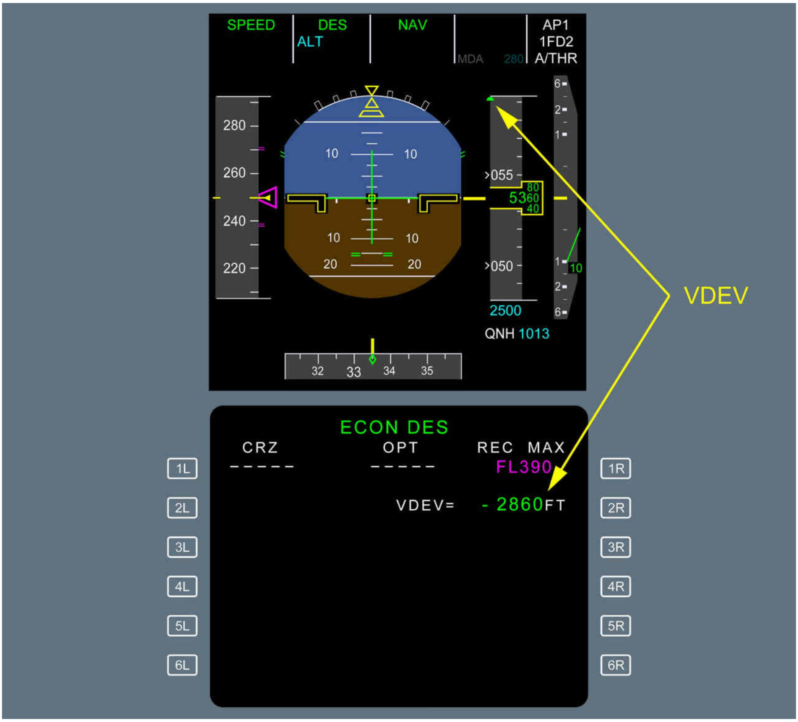
- **If the aircraft is flying at an altitude that is higher than both the descent speed limit altitude and the destination elevation +5 000 ft:**

  The FMGES maintains the V/S at -1 000 ft/min and the target speed, until the aircraft reaches the altitude constraint, or intercepts the descent profile.

- **If the aircraft is flying at an altitude that is lower than either the descent speed limit altitude, or the destination elevation +5 000 ft:**

  The FMGES maintains the V/S at -500 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.


GS 470 TAS 466
146 / 4
ILS APP
TIGER 320°
13.0 NM
13:33
28
29
30
31
32
33
34
35
0
1
BIG
−2500
D139L
TIGER
CLIFF
30
20
20
30

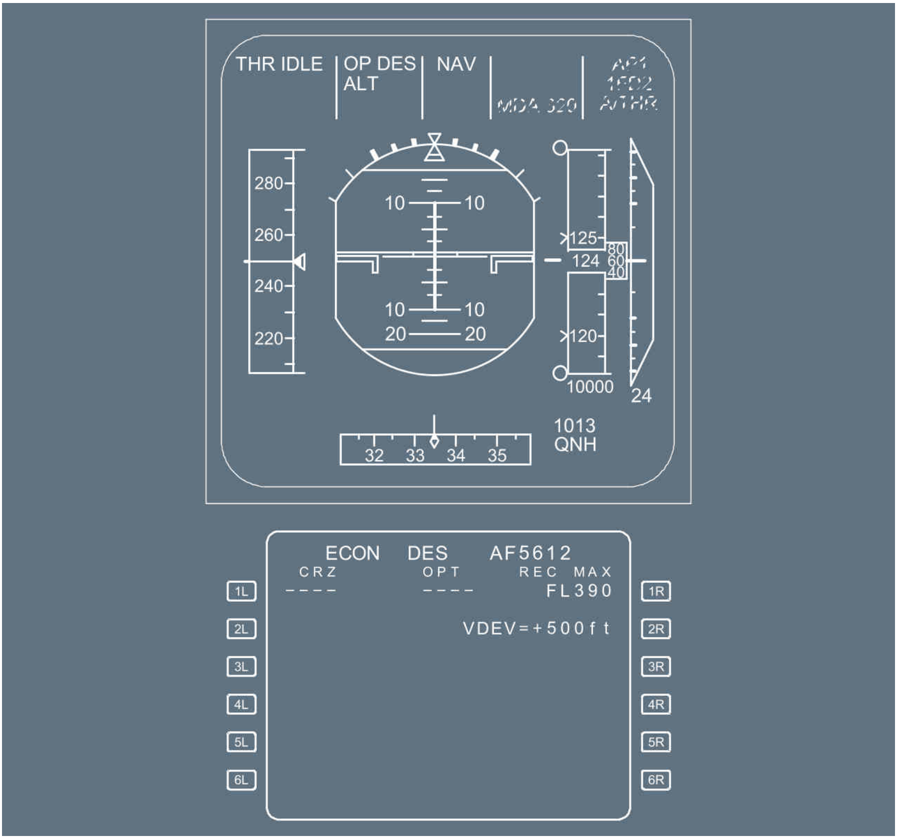

SPEED
DES
ALT
NAV
AP1
1FD2
A/THR
MDA
280
280
260
240
220
10
20
>055
5360
80
40
>050
2500
QNH 1013
32
33
34
35
VDEV
ECON DES
CRZ
OPT
REC MAX
FL390
VDEV= - 2860FT
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

- **If the rate of descent has to be increased (ATC requirement):**
  SELECT OP DES mode.
  Increase the target speed, or extend the speedbrakes.

Ident.: PRO-NOR-SRP-01-60-A-00002496.0001001 / 09 OCT 12

OP DES, V/S OR FPA MODE ENGAGED

- In either case, the aircraft is no longer guided on the descent profile and altitude constraints are disregarded. If NAV mode is engaged the ND displays a white circle on waypoints with an altitude constraint. If NAV mode is disengaged, the circles are removed.
- The PFD still shows VDEV for reference purposes.
- The target altitude is always the FCU selected altitude (shown in blue).
  On the ND, level-off symbol is blue (no constraint). If NAV mode is engaged and the speed target managed, speed constraints are taken into account.


THR IDLE
OP DES
ALT
NAV
MDA 320
AP1
1FD2
A/THR
280
260
240
220
10
10
10
10
20
20
125
124
120
80
60
40
10000
24
1013
QNH
32
33
34
35
ECON
DES
AF5612
CRZ
OPT
REC MAX

FL390
VDEV=+500ft
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R

Vertical position may also be accessed by using the energy circle displayed on the navigation display when HDG/TRK is engaged.

PROCEDURE

SET the FCU altitude as cleared by ATC, while also considering the applicable safe altitude.

If the next safe altitude is higher than the ATC-cleared altitude, check with ATC that this constraint applies.
If confirmed, set the FCU altitude at the safe altitude until it is safe to fly at the cleared altitude.

MONITOR the speed target when the aircraft reaches the speed change symbol.
MONITOR the FMA ALT*, ALT, upon reaching the level symbol.
MONITOR the energy circle on the ND when in HDG/TRK mode.

The MCDU F-PLN page presents SPD/ALT constraint-matching predictions, which assume that DES mode is reengaged immediately.

CHECK the predictions before reengaging DES mode (in order to resume the descent profile).

Note: *VDEV is available on the PFD even in HDG mode ; it is a valuable tool for monitoring the descent as long as cross-track error (XTK) is less than five nautical miles*
The aircraft decelerates for approach automatically only if it flies over the DECEL pseudo waypoint with NAV mode engaged (or LOC, LOC).*

MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA

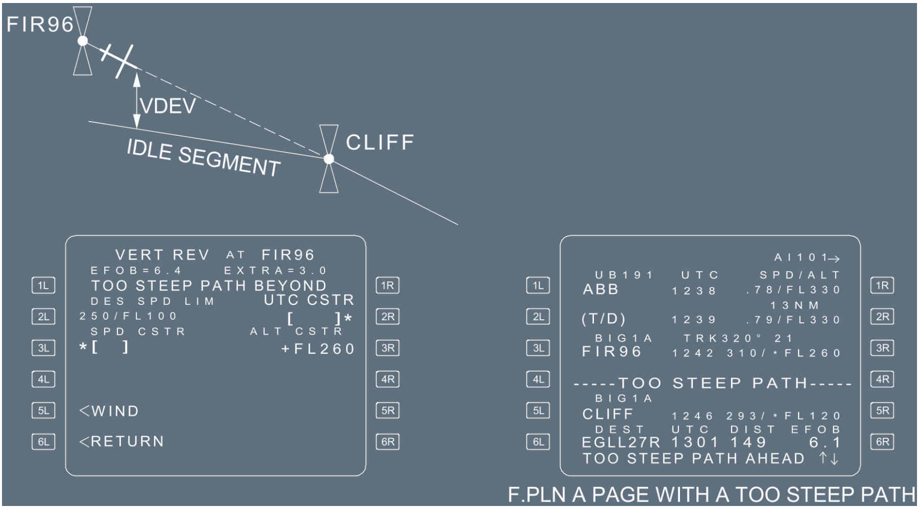
Ident.: PRO-NOR-SRP-01-60-00002497.0001001 / 07 FEB 11
Applicable to: ALL

If the MCDU “SYSTEM (AREA) (PROCEDURE) RNP IS XX.X” message is displayed, the crew will verify the manually-entered RNP value in the REQUIRED field of the PROG page and clear or modify it, if it is not in accordance with the RNP value specified in the area (Nav or approach chart).

TOO STEEP PATH

Ident.: PRO-NOR-SRP-01-60-00002498.0001001 / 07 FEB 11
Applicable to: ALL

“TOO STEEP PATH AHEAD” appears on the MCDU scratchpad, when the system predicts this situation, and TOO STEEP PATH is displayed on the F-PLN page.
When the aircraft is crossing the first waypoint of a TOO STEEP PATH, the system computes a flyable descent profile (with an idle segment). The VDEV makes a jump because it is related to a new profile.



```
      VERT REV   AT   FIR96
    EFOB=6.4        EXTRA=3.0
    TOO STEEP PATH BEYOND
    DES SPD LIM         UTC CSTR
  250/FL100               [    ]*
    SPD CSTR          ALT CSTR
  *[    ]                 +FL260


  <WIND

  <RETURN
```

```
                                AI101→
    UB191      UTC       SPD/ALT
  ABB          1238     .78/FL330
                            13NM
  (T/D)        1239     .79/FL330
    BIG1A       TRK320°  21
  FIR96        1242  310/*FL260
  -----TOO STEEP PATH-----
    BIG1A
  CLIFF        1246  293/*FL120
    DEST       UTC   DIST  EFOB
  EGLL27R  1301  149       6.1
  TOO STEEP PATH AHEAD  ↑↓
```

F.PLN A PAGE WITH A TOO STEEP PATH

PROCEDURE :

- **When passing the first waypoint of the TOO STEEP PATH :**
  MONITOR VDEV and predictions at the next CSTR waypoint.
  If required, EXTEND the speedbrakes before seeing the “EXTEND SPD BRK” message.
  CONSIDER using a holding pattern, if necessary.

HOLDING PATTERN

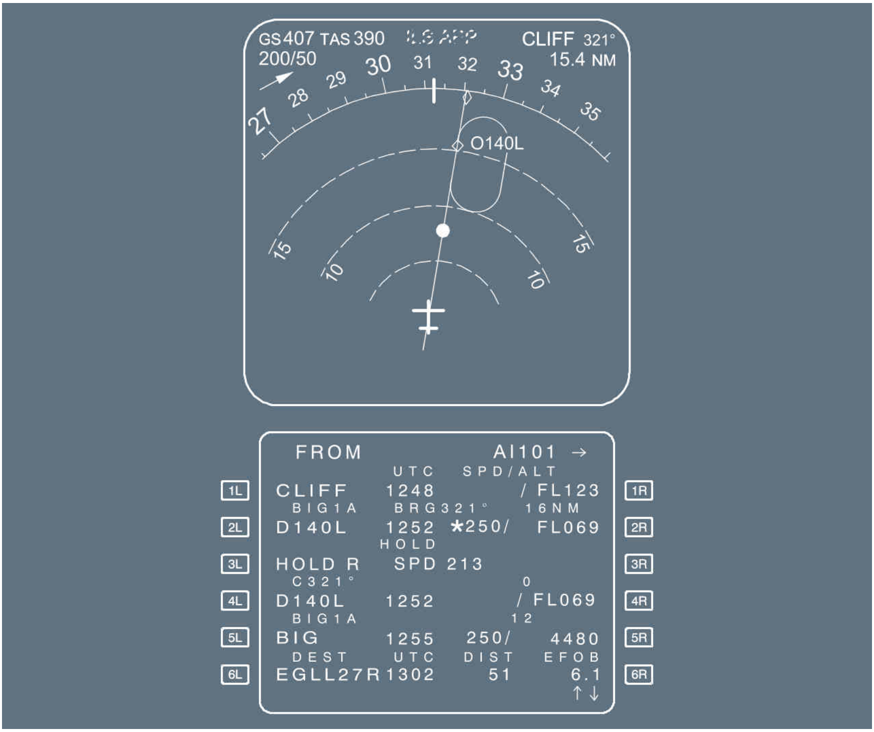
Ident.: PRO-NOR-SRP-01-60-00002499.0001001 / 09 OCT 12
Applicable to: ALL

A hold may be required during the descent and manually inserted.

PROCEDURE

PRESS the F-PLN key.
SELECT the lateral revision page.
SELECT the HOLD prompt.
CHECK the HOLDING data, and MODIFY it if necessary.
CHECK the temporary flight plan and INSERT the holding pattern in it.

Note: *If the holding fix is close to the DECEL pseudo waypoint and the speed is managed, manually activate the approach phase to change the managed target speed to approach speed (VAPP). This will avoid having an inappropriate increase of speed.*



```
     FROM                  AI101 →
             UTC    SPD/ALT
1L  CLIFF    1248         / FL123  1R
     BIG1A    BRG321°    16NM
2L  D140L    1252  *250/   FL069  2R
            HOLD
3L  HOLD R    SPD 213              3R
     C321°                 0
4L  D140L    1252         / FL069  4R
     BIG1A               12
5L  BIG      1255   250/    4480  5R
     DEST     UTC    DIST    EFOB
6L  EGLL27R  1302     51      6.1  6R
                              ↑↓
```

MANUAL TERMINATION

Ident.: PRO-NOR-SRP-01-60-00002500.0001001 / 10 DEC 09
Applicable to: ALL

You should not use DES mode when entering a leg with manual termination. Manual termination, which is defined as a track or a heading with no termination, is always part of a database procedure. The computed descent flight profile may not be adequate when flying this type of leg.

Intentionally left blank

Approach

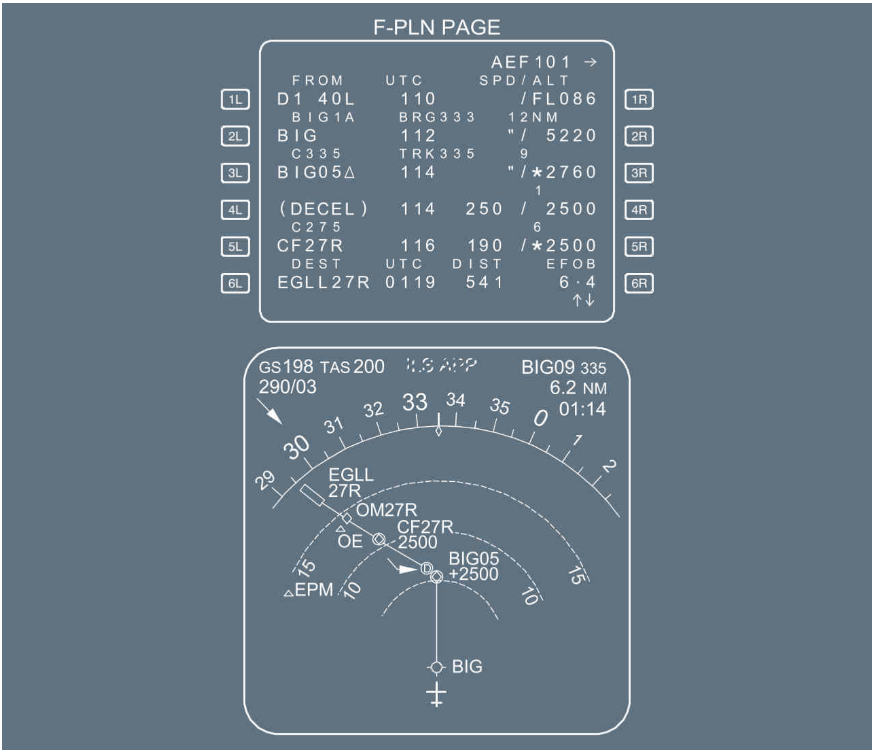
INITIAL APPROACH

Ident.: PRO-NOR-SRP-01-70-00002506.0001001 / 29 MAY 13
Applicable to: ALL

UPON REACHING THE INITIAL AREA

ACTIVATE the APPROACH PHASE, either

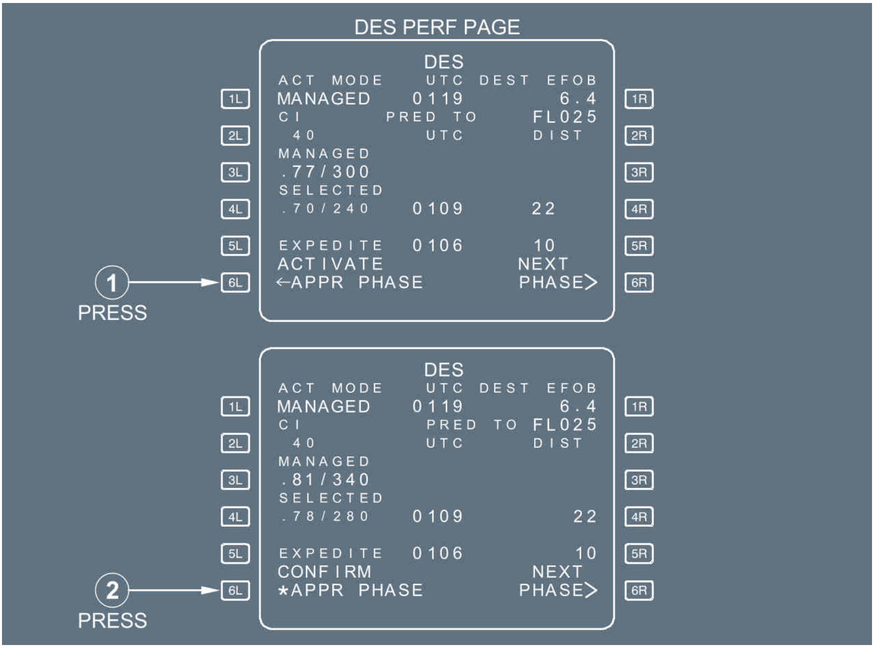
- Automatically, when flying over the DECEL pseudo waypoint (NAV/APPR NAV or LOC* or LOC mode engaged), or
- Manually on the PERF page, when the HDG mode is engaged, if an early deceleration is required, or when flying a go-around.



F-PLN PAGE

```
                                AEF101 →
   FROM      UTC       SPD/ALT
D1 40L       110              /FL086
   BIG1A     BRG333     12NM
BIG          112           "/  5220
   C335      TRK335      9
BIG05△       114           "/*2760
                            1
(DECEL)      114     250  /  2500
   C275                     6
CF27R        116     190  /*2500
   DEST     UTC     DIST      EFOB
EGLL27R    0119     541       6.4
                                 ↑↓
```

1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
GS198 TAS200
ILS APP
BIG09 335
290/03
6.2 NM
01:14
29
30
31
32
33
34
35
0
1
2
EGLL
27R
OM27R
OE
CF27R
2500
BIG05
+2500
15
10
EPM
10
15
BIG



DES PERF PAGE

```
                 DES
ACT MODE      UTC DEST  EFOB
MANAGED       0119       6.4
CI         PRED TO     FL025
 40           UTC       DIST
MANAGED
.77/300
SELECTED
.70/240       0109       22

EXPEDITE      0106       10
ACTIVATE                NEXT
<APPR PHASE           PHASE>
```

```
                 DES
ACT MODE      UTC DEST  EFOB
MANAGED       0119       6.4
CI            PRED TO  FL025
 40           UTC       DIST
MANAGED
.81/340
SELECTED
.78/280       0109        22

EXPEDITE      0106        10
CONFIRM                 NEXT
*APPR PHASE           PHASE>
```

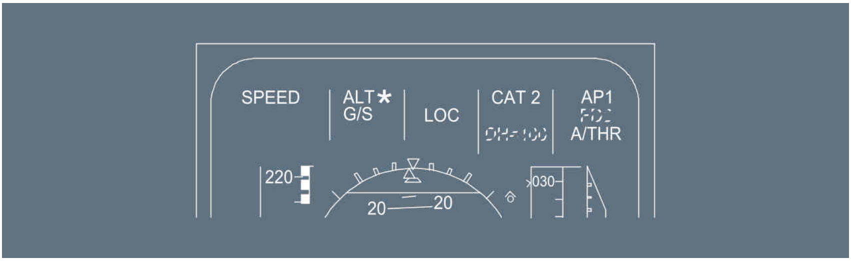
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
① PRESS
② PRESS

MANAGED SPEED

CHECK that managed speed is active : MONITOR the target speed.

Note: *The aircraft decelerates automatically at DECEL pseudowaypoint when managed speed is active and NAV mode is engaged (DECEL point displayed in magenta).*

During the approach, the autothrust maintains the maneuvering speed of the current configuration. (GD, S, F, VAPP).



SPEED
ALT*
G/S
LOC
CAT 2
DH=100
AP1
FD1
A/THR
220
030
20
20

PROCEDURE

- **If ATC requires a specific speed:**

  SWITCH to selected speed (turn and pull the speed selector knob on the FCU).

  ADJUST the aircraft configuration accordingly.

- **If ATC orders successive step descents down to the final approach flight path:**

  Use the V/S or FPA mode.

  MONITOR V/DEV.

NAV ACCURACY

As required by the SOP.
(*Refer to PRO-NOR-SOP 18 Aircraft Guidance Management*).
Without GPS, and when no DME is available for the accuracy check, use HIGH/LOW on the PROG page. In this case, consider a "HIGH" to be equivalent to a positive crosscheck.

ATC CLEARANCE

MODIFY the F-PLN, RAD NAV, and PERF APPR data to agree with the latest clearance and landing information.

APPROACH WITH ILS/GLS (IF INSTALLED)/SLS (IF INSTALLED)

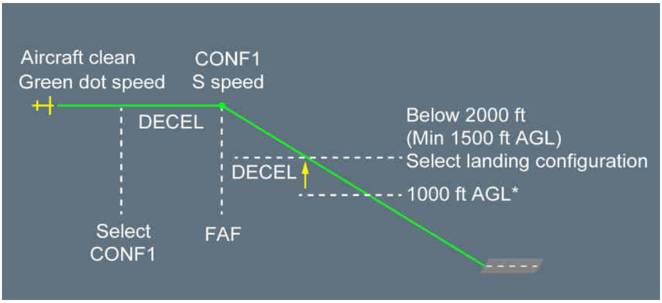
Ident.: PRO-NOR-SRP-01-70-A-00002507.0001001 / 15 NOV 21
Applicable to: ALL

INTERMEDIATE/FINAL APPROACH (ILS / GLS ◁ / LPV (WITH SLS ◁) APPROACH ENTERED IN THE F-PLN)

The preferred technique for flying an ILS / GLS ◁ / LPV (with SLS ◁) approach is to fly a decelerated approach using the AP/FDs, the LOC and G/S modes, autothrust in the SPEED mode, managed speed target is recommended.

DECELERATED APPROACH

The decelerated approach technique brings the aircraft down to 1 000 ft, at VAPP. In most cases, the interception of the final descent path is achieved with CONF 1 at S speed.


Aircraft clean
Green dot speed
CONF1
S speed
DECEL
Below 2000 ft
(Min 1500 ft AGL)
Select landing configuration
DECEL
1000 ft AGL*
Select
CONF1
FAF

(*) The approach must be stabilized at approach speed (mini ground speed) in the landing configuration before reaching 1 000 ft AGL.

Ident.: PRO-NOR-SRP-01-70-A-00002508.0004001 / 15 NOV 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

APPROACH MODE ACTIVATION (LOC - G/S)

- **When cleared by ATC and when appropriate:**

  PRESS the APPR pb on the FCU to arm the APPR mode for the approach entered in the flight plan.

  Note: *If a non ILS/GLS ◁ approach is selected in the active flight plan and if the pilot manually tunes an ILS/GLS ◁ on the RADIO NAV page:*
  - The MCDU and PFD display CHECK APPR SELECTION. This message is a reminder to the pilot that this manually-tuned landing system does not correspond to the approach that is selected in the flight plan.
  - When the APPR pb is pressed in on the FCU, the available approach guidance modes are LOC and G/S.

  The FCU APPR pb arms or engages LOC and G/S modes, if :
  - An ILS/GLS ◁ /LPV (with SLS ◁) approach is entered in the flight plan, or
  - An ILS/GLS ◁ is manually-tuned on the RADIO NAV page, or
  - Both RMPs are set to NAV, and an ILS/GLS ◁ is selected.

Ident.: PRO-NOR-SRP-01-70-A-00002508.0001001 / 21 MAR 16
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

APPROACH MODE ACTIVATION (LOC - G/S)

- **When cleared by ATC and when appropriate:**

  PRESS the APPR pb to arm the APPR mode for the approach entered in the flight plan.

  Note: *If a non precision approach is selected in the active flight plan and if the pilot manually tunes an ILS/GLS on the RAD NAV page, the MCDU and PFD display "CHECK APPR SELECTION". This message is a reminder to the pilot that, although an ILS/GLS is tuned on RAD NAV page, the available approach guidance modes are APP NAV - FINAL when the APPR pb is pressed in on the FCU.*

  The FCU APPR pb arms or engages LOC and G/S modes, if :
  - An ILS/GLS approach is entered in the flight plan, or
  - No approach, or only a runway, is entered in the flight plan, and an ILS/GLS is manually-tuned on the RAD NAV page, or
  - Both RMPs are set to NAV, and an ILS/GLS is selected.

Ident.: PRO-NOR-SRP-01-70-A-00002509.0001001 / 12 MAY 22
Applicable to: ALL

AUTOLAND

CHECK that the FMA displays the aircraft capability for the intended ILS/GLS approach (CAT 2 or CAT 3 for ILS, AUTOLAND for GLS).
MONITOR the radio automatic callout.

- **At 350 ft RA:**

  CHECK that LAND is displayed on the FMA.

  CHECK ILS/GLS course.

  Note: *If LAND is not displayed or if the ILS/GLS course is not correct, do not perform an autoland. The flight crew should perform a go-around, if visual references are not sufficient.*

- **At 40 ft RA:**

  CHECK that FLARE is displayed on the FMA.

- **At approximately 30 ft RA:**

  CHECK that IDLE is displayed on the FMA and that autothrust starts to reduce thrust toward IDLE.

- **At 10 ft, “RETARD” callout comes up:**

  MOVE the thrust levers to IDLE.

  L2 *Autothrust disconnects.*

L1
- **At touchdown:**

  CHECK that ROLL OUT appears on the FMA.

- **At the end of the rollout:**

  Disconnect the autopilot.

  L2 *If the flight crew does not disconnect the AP at the end of the rollout, and uses the nosewheel steering handwheel to taxi the aircraft off the runway, the following will occur:*
  - *The AP will try to steer the aircraft back to the runway centerline, if the nosewheel steering handwheel is released and the aircraft heading is less than 20 ° off the runway centerline*
  - *The AP will automatically disconnect, if the aircraft heading is 20 ° or more off the runway centerline.*

Ident.: PRO-NOR-SRP-01-70-A-00002510.0001001 / 21 NOV 11
Applicable to: ALL

MANUAL LANDING

- **at DH**

  DISCONNECT the autopilots. SPEED mode remains engaged.

- **At 20 ft “RETARD” automatic call out comes up**

  MOVE the thrust levers to IDLE if they are not there already. (The autothrust disconnects).

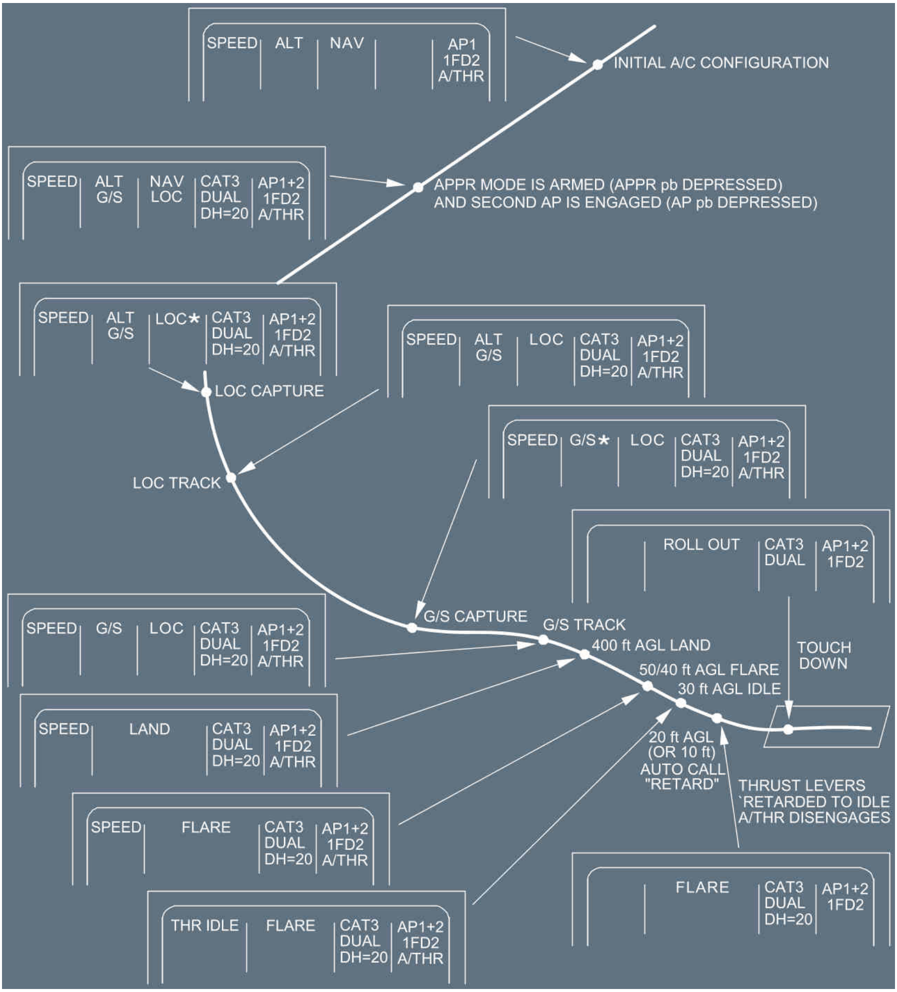
- **At touch down**

  “ROLL OUT” appears on the FMA and the yaw bar comes up on the PFD.

  Note: *The retard call out is only a reminder when a manual landing is performed.*

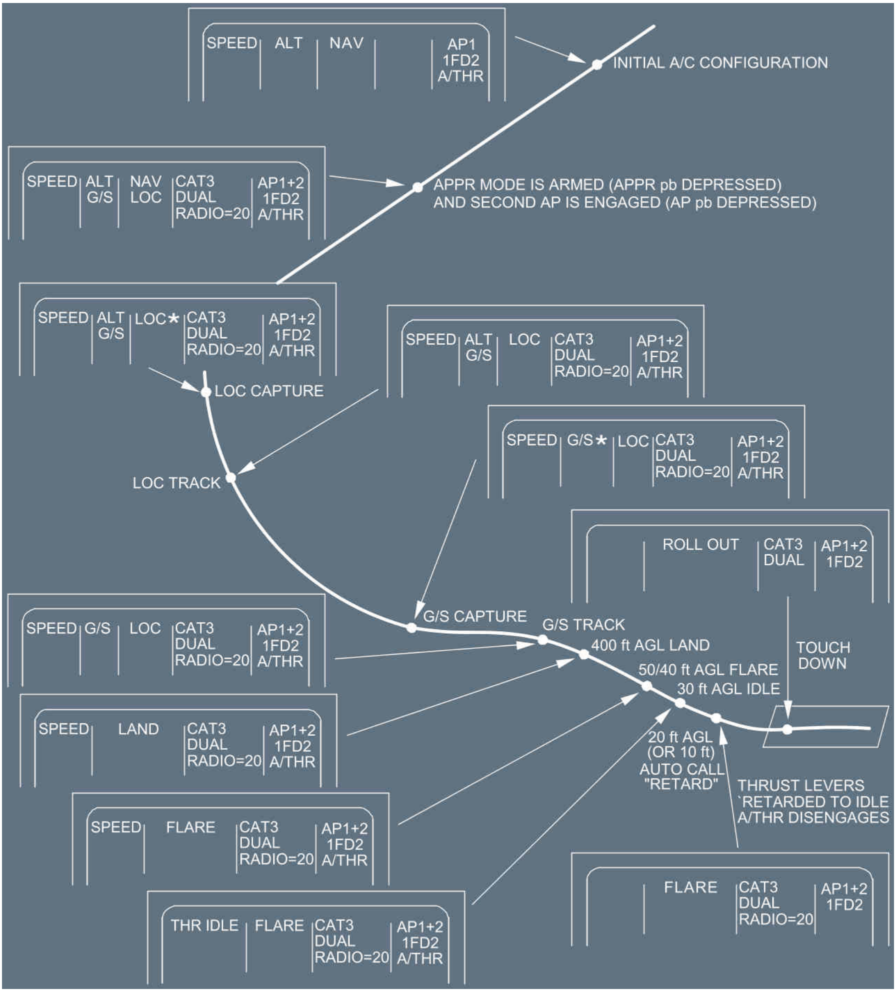
Ident.: PRO-NOR-SRP-01-70-A-00002511.0001001 / 09 OCT 12
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

STANDARD ILS AUTOMATIC APPROACH


SPEED ALT NAV AP1 1FD2 A/THR
INITIAL A/C CONFIGURATION
SPEED ALT G/S NAV LOC CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
APPR MODE IS ARMED (APPR pb DEPRESSED) AND SECOND AP IS ENGAGED (AP pb DEPRESSED)
SPEED ALT G/S LOC* CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
LOC CAPTURE
SPEED ALT G/S LOC CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
LOC TRACK
SPEED G/S* LOC CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
ROLL OUT CAT3 DUAL AP1+2 1FD2
G/S CAPTURE
G/S TRACK
400 ft AGL LAND
50/40 ft AGL FLARE
30 ft AGL IDLE
TOUCH DOWN
SPEED G/S LOC CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
SPEED LAND CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
20 ft AGL (OR 10 ft) AUTO CALL "RETARD"
THRUST LEVERS RETARDED TO IDLE A/THR DISENGAGES
SPEED FLARE CAT3 DUAL DH=20 AP1+2 1FD2 A/THR
FLARE CAT3 DUAL DH=20 AP1+2 1FD2
THR IDLE FLARE CAT3 DUAL DH=20 AP1+2 1FD2 A/THR

Ident.: PRO-NOR-SRP-01-70-A-00002511.0003001 / 09 OCT 12
Applicable to: LV-KHT, LV-KHU

STANDARD ILS AUTOMATIC APPROACH


SPEED ALT NAV AP1 1FD2 A/THR
INITIAL A/C CONFIGURATION
SPEED ALT G/S NAV LOC CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
APPR MODE IS ARMED (APPR pb DEPRESSED)
AND SECOND AP IS ENGAGED (AP pb DEPRESSED)
SPEED ALT G/S LOC★ CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
LOC CAPTURE
SPEED ALT G/S LOC CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
LOC TRACK
SPEED G/S★ LOC CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
ROLL OUT CAT3 DUAL AP1+2 1FD2
G/S CAPTURE
G/S TRACK
400 ft AGL LAND
50/40 ft AGL FLARE
30 ft AGL IDLE
TOUCH DOWN
SPEED G/S LOC CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
SPEED LAND CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
20 ft AGL (OR 10 ft) AUTO CALL "RETARD"
THRUST LEVERS RETARDED TO IDLE A/THR DISENGAGES
SPEED FLARE CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR
FLARE CAT3 DUAL RADIO=20 AP1+2 1FD2
THR IDLE FLARE CAT3 DUAL RADIO=20 AP1+2 1FD2 A/THR

Ident.: PRO-NOR-SRP-01-70-A-00002512.0001001 / 26 NOV 13
Applicable to: ALL

EARLY SELECTION OF APPROACH MODE LOC - G/S

Pressing the APPR pb arms LOC and G/S.
When the aircraft is above 5 000 ft AGL, the Radio altimeter signals may not be valid. As long as the Radio altimeter signals are invalid, the FMA displays CAT 1.

- **When the aircraft is cleared for an ILS/GLS ◁ approach:**
  PRESS the APPR pb on the FCU.
- **When the aircraft is below 5 000 ft AGL:**
  Check that the FMA displays the correct capability for the intended approach.

Ident.: PRO-NOR-SRP-01-70-A-00002513.0001001 / 20 NOV 14
Applicable to: ALL

GLIDE SLOPE INTERCEPTION FROM ABOVE

If the aircraft is above the glide slope, the system will not capture the G/S automatically.
The pilot must bring the aircraft onto the glide slope beam, and selects an appropriate V/S to intercept it. Refer to the Section PRO NOR SOP.

Ident.: PRO-NOR-SRP-01-70-A-00002514.0001001 / 15 NOV 21
Applicable to: ALL

DATA LOCK

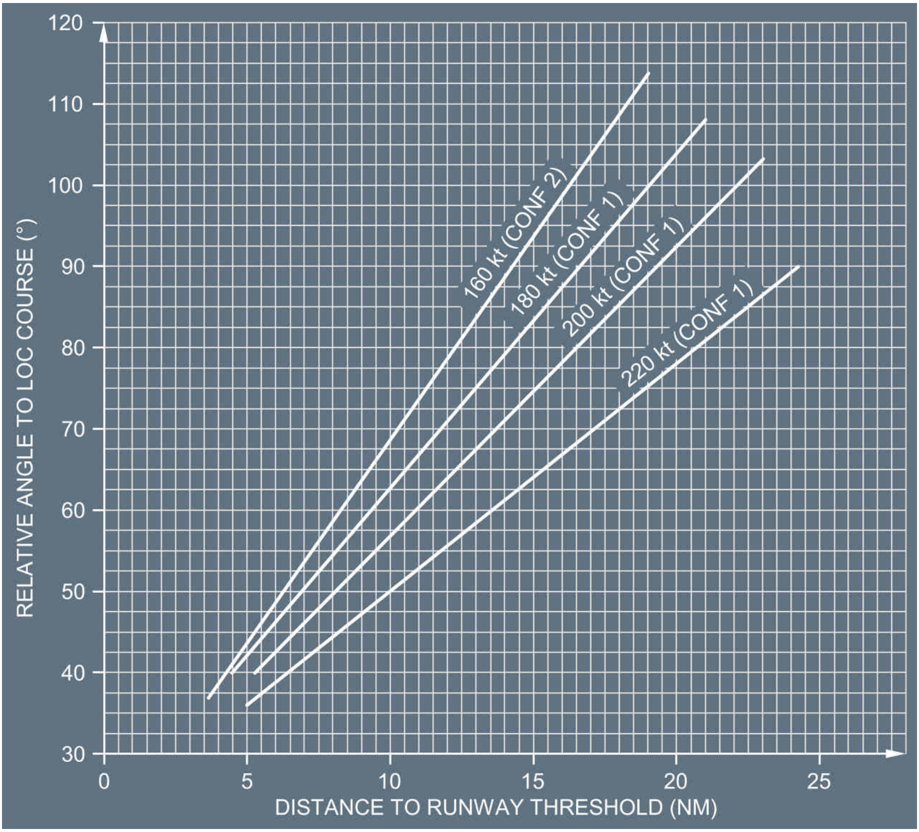
When the aircraft reaches 700 ft RA with APPR mode (LOC and G/S) armed or engaged, the ILS /GLS ◁ / SLS ◁ frequency/channel and course are frozen in the receiver.
This function (LS tune inhibit) is available when at least one AP/FD is engaged. Any attempt to change ILS / GLS ◁ frequency or CRS through the MCDU or RMP does not affect the receiver. In the same way SLS ◁ de-selection is not available.
If the speed is managed, the system does not accept any modifications the flight crew may enter on the PERF APPR page (surface wind, selected landing configuration, or VAPP) for speed guidance purposes below this altitude.
When the aircraft reaches 400 ft RA, LAND mode engages. The flight crew can disengage this mode only by engaging the GO AROUND mode.

Ident.: PRO-NOR-SRP-01-70-A-00002515.0001001 / 12 FEB 13
Applicable to: ALL

USE OF RMPS FOR ILS/DME OR GLS ◁

If both FMGECs fail, the flight crew can use the RMPs (Radio Management Panels 1 and 2) for back up tuning. Either RMP controls ILS/GLS ◁ . Prior to select an ILS frequency or a GLS ◁ channel on one of the RMPs, the flight crew has to select NAV pb-sw from RMP1 and RMP2.

The flight crew must always monitor the capture of a LOC beam. During this evolution, the PFD and ND must indicate that associated deviation indications move toward the centre of the scale. To avoid performing a false capture, the flight crew must be careful not to arm the LOC too early.
The following graph shows the angle of interception versus distance to the runway threshold that ensures that the aircraft will not overshoot the axis by more than one and a half dot.



The capture begins when the deviation is two dots or less. It is programmed to line the aircraft up on the beam with a single overshoot, even if the intercept angle is large.

Note: *ICAO requires loc beam to ensure a normal capture within 10 NM and +/- 35 ° of the course centerline. Some current ILS/GLS systems just meet the requirement and are subject to false capture outside these limits.*

SWITCHING FROM NON PRECISION TO ILS/GLS APPROACH

Ident.: PRO-NOR-SRP-01-70-00002517.0001001 / 03 NOV 21
Applicable to: ALL

If an ILS/GLS approach is possible when a non precision was previously scheduled, use one of the following procedures :

USE OF SECOND FLIGHT PLAN

Use a secondary flight plan to prepare the alternate ILS/GLS approach, time permitting.

COPY the ACTIVE flight plan.
REVISE the ARRIVAL : insert the ILS/GLS approach and the applicable STAR/VIA.
On the RAD NAV page, TUNE in the ILS/GLS manually.
REVISE the PERF APPR page.

CHANGE OF THE CLEARANCE

ATC changes the clearance from the non precision to the ILS/GLS approach.

- **If a secondary flight plan has been prepared :**

  ACTIVATE the SEC F-PLN and adjust.

  Follow subsequent standard procedures.

- **If a secondary flight plan has not been prepared :**

  REVISE the ARRIVAL on the primary F-PLN, inserting the ILS/GLS approach.

  REVISE the PERF APPR page.

  Follow subsequent standard procedures.

CAUTION If the flight crew decides to fly the ILS/GLS approach without revising the arrival of the primary flight plan (a non precision approach is in the F-PLN), LOC and G/S modes will not be available when the flight crew presses the APPR pb.

Consequently, the flight crew should:
- Manually TUNE in the ILS/GLS on the RAD NAV page : CHECK that the CHECK APPR SELECTION message comes up.
- Press the LS pushbutton and select ROSE LS on the EIS CONTROL panel.
- Use HDG, V/S or TRK, FPA modes to fly the ILS/GLS .

LANDING CATEGORIES

Ident.: PRO-NOR-SRP-01-70-00002523.0001001 / 12 FEB 13
Applicable to: ALL

Each FMGEC computes its own landing category:
- For ILS: CAT 1, CAT 2, CAT 3 single, and CAT 3 dual
- For GLS : CAT 1 AUTOLAND.

Each FMGEC then displays the corresponding landing category on the FMA.
Each category depends upon the availability of aircraft systems and functions.
When the landing category downgrades, a triple clic aural warning is activated.

FAIL-OPERATIONAL AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-operational if, in the event of a failure below alert height, the remaining part of the automatic system allows the aircraft to complete the approach, flare, and landing. A CAT 3 DUAL system is a fail-operational automatic landing system.

Note: *In the event of a failure, the automatic landing system operates as a fail-passive system.*

FAIL-PASSIVE AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude, but the landing is not completed automatically. A CAT 3 single system is a fail-passive automatic landing system.

Note: *With a fail-passive automatic landing system the pilot assumes control of the aircraft after a failure.*

Below 200 ft (radio altimeter), the FMGES freezes the landing capability until LAND mode is disengaged or both autopilots are off.
Therefore a failure occuring below 200 ft does not change the category of the system.

ALERT HEIGHT

The alert height is the height above touch down, above which a CAT 3 autoland would be discontinued and a missed approach executed, if a failure occured in either the airplane systems or the relevant ground equipments.
Below the alert height, if such a failure occurs, the flare, touchdown and roll out may be accomplished using the remaining automatic system.

WARNINGS FOR ILS/GLS ◁ APPROACH

Ident.: PRO-NOR-SRP-01-70-00002524.0004001 / 26 NOV 19
Applicable to: ALL

AUTOLAND WARNING

With “LAND” or “FLARE” on the FMA and at least one AP engaged, the AUTOLAND light appears on the glareshield when the aircraft is below 200 ft RA and one of the following event occurs:
- The autopilots are lost
- The aircraft gets too far from the beam (LOC and G/S flash on PFD)
- Loss of LOC signal above 15 ft, or loss of glide signal above 100 ft (transmitter or receivers)
- The difference between both radio altimeter indications is greater than 15 ft
- The FMGES detects a long flare
- The FMGES detects a too-early flare.

WARNING OF EXCESSIVE BEAM DEVIATION

This warning is a flashing of the LOC and G/S scales on the PFD and ND ROSE if one of the following event occurs:
- G/S deviation is greater than 1 dot (above 100 ft RA)
- LOC deviation is greater than ¼ dot (above 15 ft RA).

WARNING ASSOCIATED WITH ILS "LANDING CAPABILITY"

Any downgrading in the aircraft’s capability for automatic approach and landing sounds a triple-click aural warning.

FAILURE OF BOTH LOCALIZER AND GLIDESLOPE RECEIVERS

The PFD and ND (rose mode) display LOC and G/S flags (if the LS pb has been pressed). LOC and G/S scales disappear from the PFD.

If LOC or G/S modes are engaged and at least one AP/FD is engaged all of the following occur:
- The AP disengages
- The FD reverts to its HDG-V/S or TRK-FPA mode.

FAILURE OF LOCALIZER OR GLIDESLOPE TRANSMITTER (WHEN CAPTURED)

If the Localizer or Glideslope transmitter fails all of the following occur:
- The corresponding index is lost
- The LOC and G/S scales flash
- The corresponding FD bars flash.

Above 200 ft RA, if the transmitter failure lasts less than 7 s, the FMA retains the LOC and G/S modes (or the LAND mode) and the AP are able to regain these modes. If the failure lasts longer than 7 s, the AP disengages and the FD reverts to its HDG-V/S or TRK-FPA mode. Below 200 ft RA, if the transmitter failure occurs, the AUTOLAND warning appears, indicating that the crew must perform a GO AROUND (if insufficient visual references) with one or 2 AP engaged.

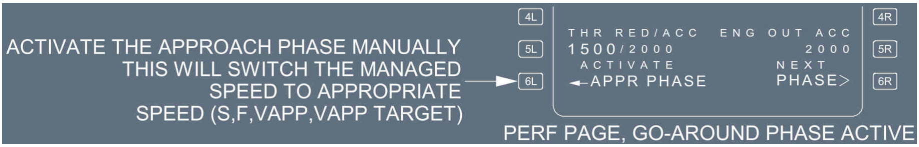
Go-Around

MONITORING THE GO-AROUND

Ident.: PRO-NOR-SRP-01-80-00002501.0001001 / 15 FEB 11
Applicable to: ALL

Engage the GO-AROUND phase and GO-AROUND modes by setting the thrust levers to the TOGA position, if at least CONF1 is selected.
When the GO-AROUND phase is engaged, the previously-flown approach is automatically strung back into the flight plan at the end of the missed approach procedure.
In the GO-AROUND phase, the system makes no predictions. Consequently, CLB and DES modes are not available, and the flight crew must monitor constraints.
When the aircraft leaves the GO-AROUND phase, all predictions and modes become available again. During a GO-AROUND phase, the managed speed is green dot.

CAUTION	If ALT* engages, as the aircraft emerges from SRS mode, and an engine-out occurs more or less simultaneously, the aircraft may lose airspeed as it tries to capture altitude.


ACTIVATE THE APPROACH PHASE MANUALLY THIS WILL SWITCH THE MANAGED SPEED TO APPROPRIATE SPEED (S,F,VAPP,VAPP TARGET)

PERF PAGE, GO-AROUND PHASE ACTIVE

HEADING/TRACK PRESET FUNCTION IN GO-AROUND PHASE

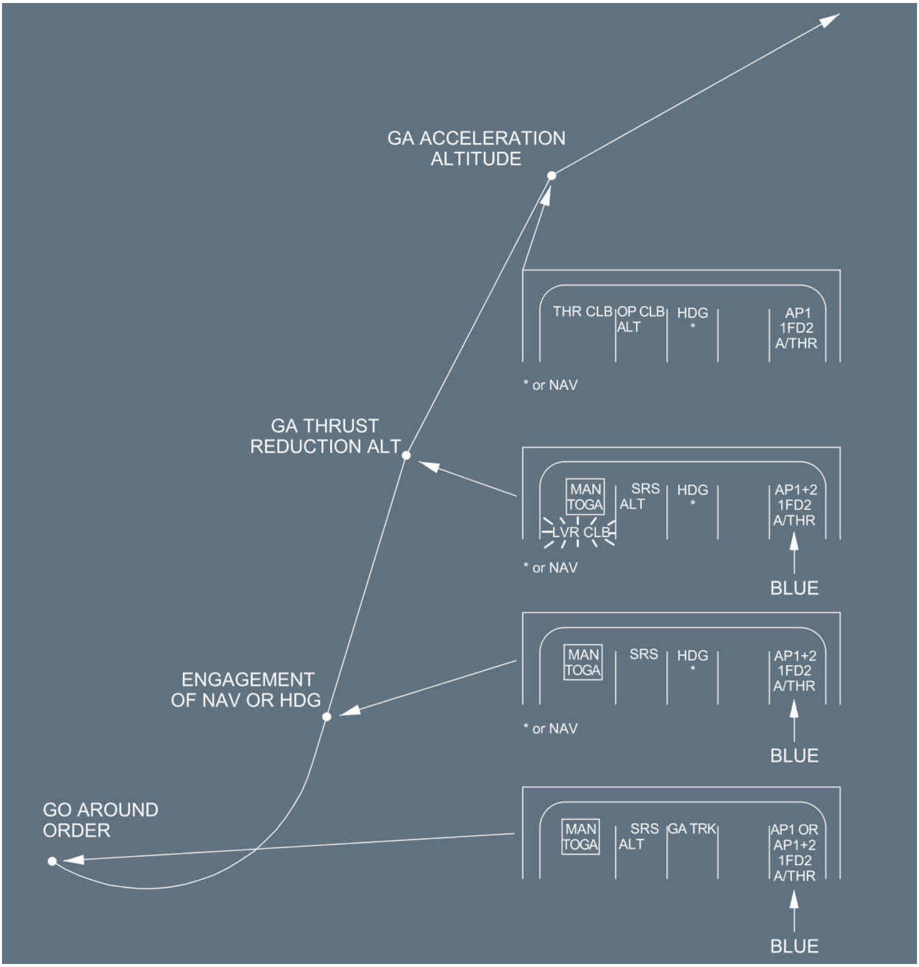
The flight crew can use the heading/track preset, when LOC*, LOC, LAND, FINAL, or GA is engaged.

SET the appropriate heading, or track value, in the window of the FCU.
When necessary, PULL the HDG/TRK selection knob to engage the mode on the preset value.

GO-AROUND PROFILE

Ident.: PRO-NOR-SRP-01-80-00002504.0003001 / 08 JUL 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

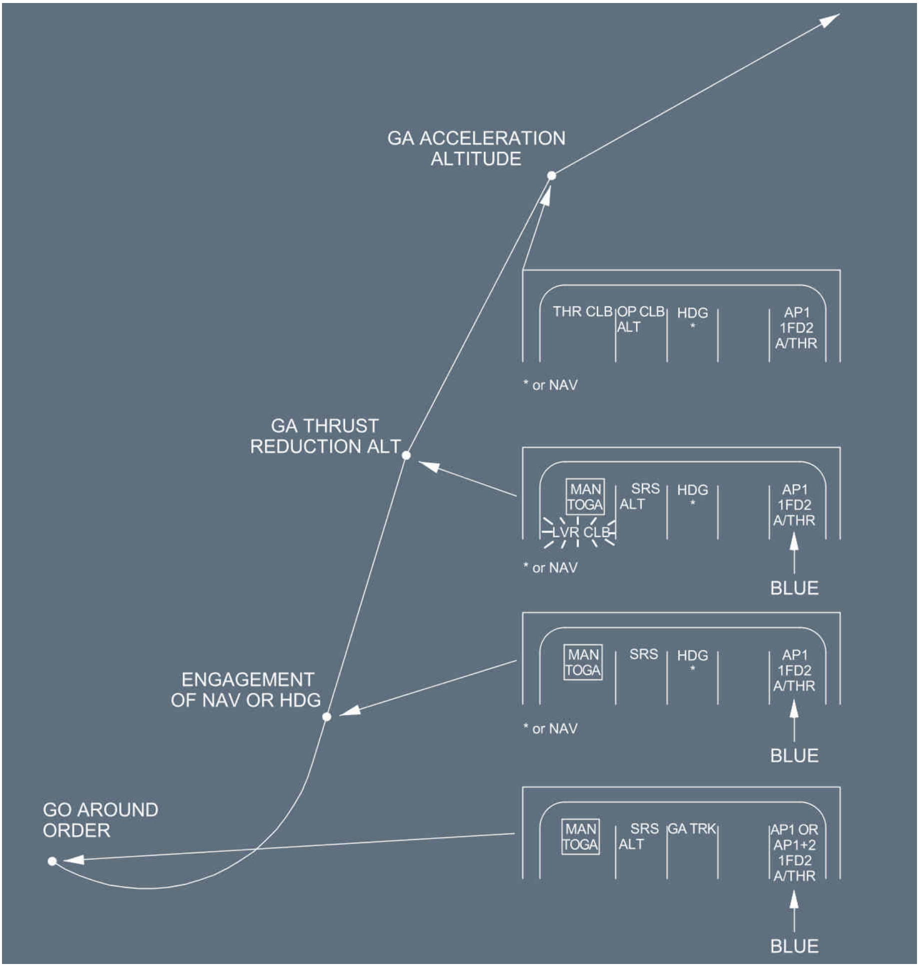
Apply SOP procedures


GA ACCELERATION
ALTITUDE
THR CLB
OP CLB
ALT
HDG
*
AP1
1FD2
A/THR
* or NAV
GA THRUST
REDUCTION ALT
MAN
TOGA
LVR CLB
SRS
ALT
HDG
*
AP1+2
1FD2
A/THR
* or NAV
BLUE
ENGAGEMENT
OF NAV OR HDG
MAN
TOGA
SRS
HDG
*
AP1+2
1FD2
A/THR
* or NAV
BLUE
GO AROUND
ORDER
MAN
TOGA
SRS
ALT
GA TRK
AP1 OR
AP1+2
1FD2
A/THR
BLUE

GO-AROUND PROFILE

Ident.: PRO-NOR-SRP-01-80-00002504.0001001 / 15 FEB 11
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

Apply SOP procedures


GA ACCELERATION ALTITUDE
THR CLB
OP CLB
ALT
HDG
*
AP1
1FD2
A/THR
* or NAV
GA THRUST REDUCTION ALT
MAN TOGA
SRS
ALT
HDG
*
LVR CLB
AP1
1FD2
A/THR
* or NAV
BLUE
ENGAGEMENT OF NAV OR HDG
MAN TOGA
SRS
HDG
*
AP1
1FD2
A/THR
* or NAV
BLUE
GO AROUND ORDER
MAN TOGA
SRS
ALT
GA TRK
AP1 OR
AP1+2
1FD2
A/THR
BLUE

MISSED APPROACH : TRY AGAIN

Ident.: PRO-NOR-SRP-01-80-00002505.0001001 / 16 NOV 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

If the flight crew intends to fly another approach to the destination
- The flight plan has all the data necessary for the missed approach.
- Green Dot is the target speed.

● **When cleared by ATC to follow the missed approach procedure**
ENGAGE NAV mode or
TURN and PULL the HDG knob to set a heading

HDG or TRK or NAV modes can be engaged only above 100 ft.

● **When entering the initial approach area**

Activate the approach phase on the MCDU PERF GO AROUND page.

● **If the APPR phase is not activated :**

- Managed approach speed will not be available.
- The system will not furnish predictions.
- MDA/MDH/DH warnings will not appear on the PFD.

MISSED APPROACH: TRY AGAIN

Ident.: PRO-NOR-SRP-01-80-00002505.0003001 / 16 NOV 11
Applicable to: LV-KHT, LV-KHU

If the flight crew intends to fly another approach to the destination
- The flight plan has all the data necessary for the missed approach.
- Green Dot is the target speed.

● **When cleared by ATC to follow the missed approach procedure**
ENGAGE NAV mode or
TURN and PULL the HDG knob to set a heading

HDG or TRK or NAV modes can be engaged only above 100 ft.

● **When entering the initial approach area**

Activate the approach phase on the MCDU PERF GO AROUND page.

● **If the APPR phase is not activated :**

- Managed approach speed will not be available.
- The system will not furnish predictions.
- BARO/RADIO warnings will not appear on the PFD.

MISSED APPROACH: DIVERT

Ident.: PRO-NOR-SRP-01-80-00002503.0001001 / 17 MAR 11
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

- **If the flight crew decides to divert to the alternate:**
  ENABLE ALTN, preferably at the TO waypoint.
- **When cleared to a waypoint:**
  PERFORM a DIRECT TO.

The system reverts automatically to CLB phase and modifies the target speed from Green Dot to initial speed.
The system automatically sets the CRZ FL at the defaulted alternate CRZ FL (FL 220 or 310), and retains the previous cost index.
The flight crew may adjust these as necessary.

Note: *Diversion may also be initiated by entering a NEW DEST in the LAT REV page at the TO Waypoint or using the secondary F-PLN if prepared. Refer to Diversion Chapter (Refer to DSC-22_20-60-110 Equitime Point).*

MISSED APPROACH: DIVERT

Ident.: PRO-NOR-SRP-01-80-00002503.0002001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

- **If the flight crew decides to divert to the alternate:**
  ENABLE ALTN, preferably at the TO waypoint.
- **When cleared to a waypoint:**
  Perform a DIRECT TO.

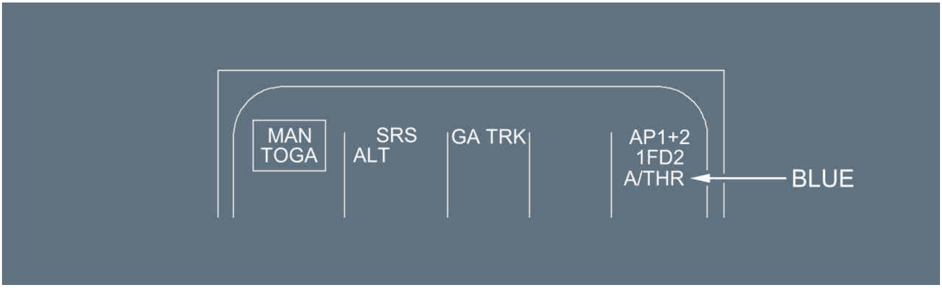
The system reverts automatically to CLB phase and modifies the target speed from Green Dot to initial speed.
The system automatically sets the CRZ FL to the defaulted alternate CRZ.
The cost index is set to 0.0 and the message USING COST INDEX-000 is triggered.
The flight crew may adjust these as necessary.

Note: *Diversion may also be initiated by entering a NEW DEST in the LAT REV page at the TO waypoint or using the secondary F-PLN if prepared (Refer to DSC-22_20-60-110 Equitime Point).*

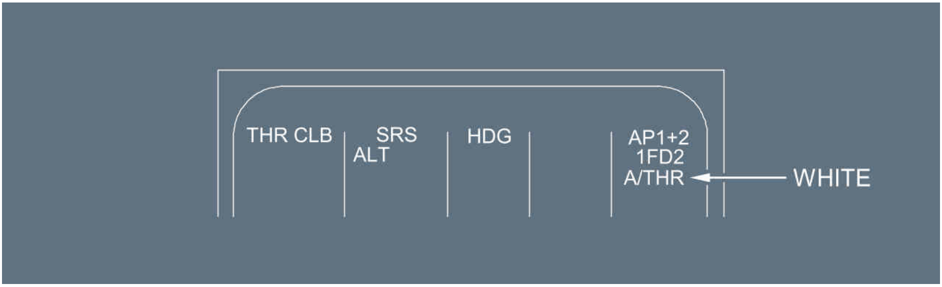
TASK SHARING DURING A GO-AROUND

Ident.: PRO-NOR-SRP-01-80-00012997.0002001 / 20 JUL 15
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

PF	PM
Announce "GO AROUND, FLAPS" *Simultaneously set thrust levers to TOGA*	Announce "FLAPS_" Retract flaps one step, and monitor engine parameters
Monitor the flight path	



•When rate of climb is positive:	
Announce "GEAR UP"	Announce "POSITIVE CLIMB"
Select NAV or HDG mode, according to ATC clearance	Retract the gear and confirm "GEAR UP"
•At go-around thrust reduction altitude THR RED	
"LVR CLB" flashes on the FMA Set thrust levers to CL detent.	



•At go-around acceleration altitude (ACC ALT)	
Monitor that the target speed increases to Green Dot	

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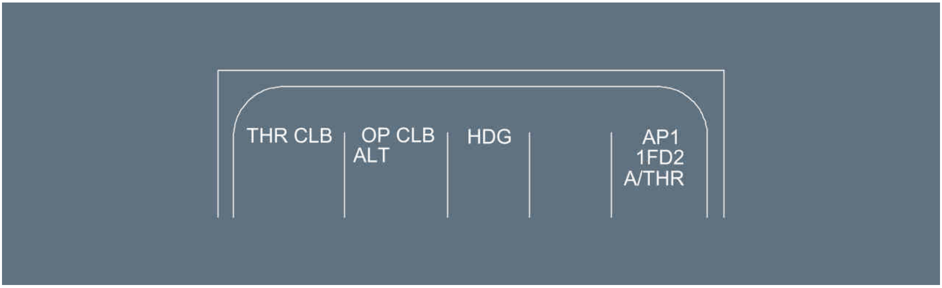


•If the speed target does not increase to Green Dot:
CHECK and PULL the altitude selector knob to engage OP CLB

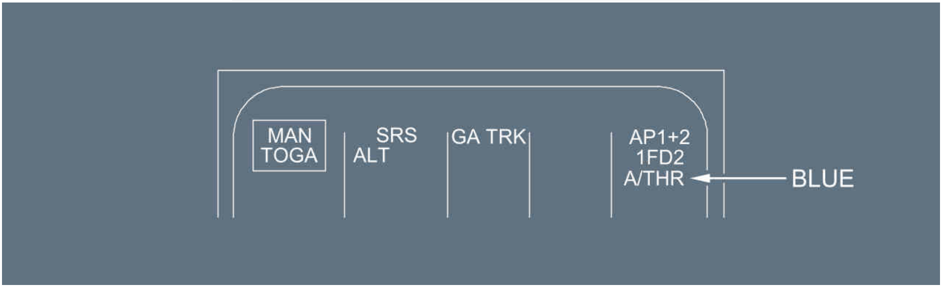
The speed target increases to Green Dot

Retract flaps on schedule

TASK SHARING DURING A GO-AROUND

Ident.: PRO-NOR-SRP-01-80-00012997.0001001 / 07 SEP 16
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

PF	PM
Announce "GO AROUND, FLAPS" *Simultaneously set thrust levers to TOGA*	Announce "FLAPS_" Retract flaps one step, and monitor engine parameters
Monitor the flight path	



•When rate of climb is positive:

PF	PM
Announce "GEAR UP"	Announce "POSITIVE CLIMB"
Select NAV or HDG mode, according to ATC clearance	Retract the gear and confirm "GEAR UP"

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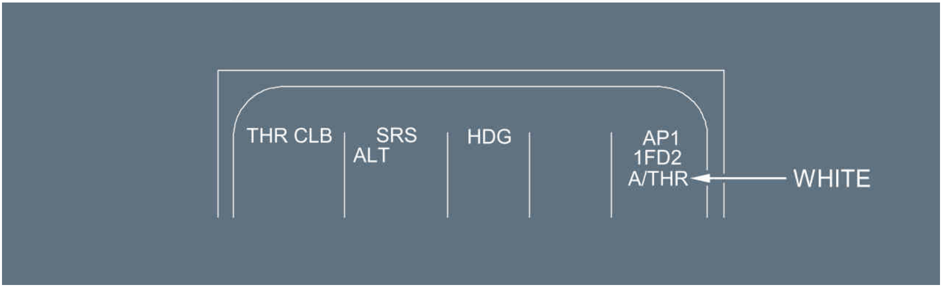
•At go-around thrust reduction altitude THR RED

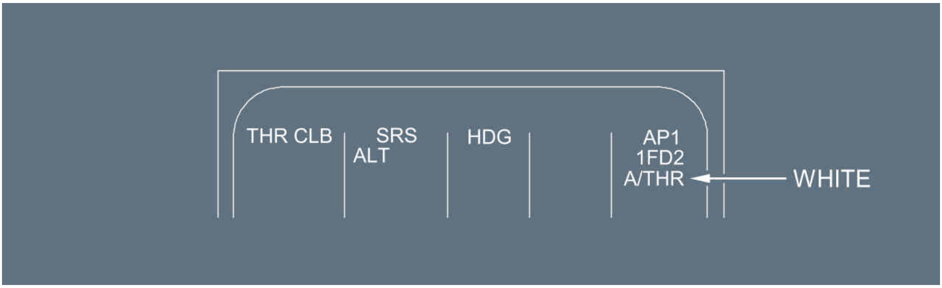
"LVR CLB" flashes on the FMA

Set thrust levers to CL detent.


THR CLB
SRS
ALT
HDG
AP1
1FD2
A/THR
WHITE

•At go-around acceleration altitude (ACC ALT)

Monitor that the target speed increases to Green Dot


THR CLB
SRS
ALT
HDG
AP1
1FD2
A/THR
WHITE

•If the speed target does not increase to Green Dot:
CHECK and PULL the altitude selector knob to engage OP CLB

The speed target increases to Green Dot

Retract flaps on schedule

PROCEDURES

SPECIAL OPERATIONS

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PRO-SPO-40A Extended Range Operations

ETOPS Critical Fuel Reserves........A
Diversion Decision Making........B
Abnormal and Emergency Procedures........C
Maximum Diversion Distance........D

PRO-SPO-42B Engine Intermix Operations

PRO-SPO-42B-10 General

General........A

PRO-SPO-42B-20 Limitations

Limitations........A

PRO-SPO-42C Engine Intermix Operations

PRO-SPO-42C-10 General

General........A

PRO-SPO-42C-20 Limitations

Limitations........A

PRO-SPO-50 Reduced Vertical Separation Minimum - RVSM

General........A
Required Equipments/Functions for RVSM........B
RVSM Normal Procedure........C
RVSM Abnormal and Emergency Procedure........D

PRO-SPO-51 Performance-Based Navigation (PBN)

General........A
RNAV 10 / RNP 10........B
RNAV 5 / BRNAV........C
RNAV 1 RNAV 2 / P-RNAV - Terminal RNAV........D
RNP 4........E
RNP 2 in Oceanic and Remote Continental Area........F
RNP 2 in Domestic Area........G
RNP 1 / Terminal RNP 1 - Basic RNP 1........H
RNP APCH / RNAV(GNSS)........I
RNP AR / RNAV(RNP)........J

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PRO-SPO-52 Performance-Based Communication and Surveillance (PBCS)

General....A
Requirements....B
Procedure....C

PRO-SPO-85 Simultaneous Parallel Approach Operations

Overview....A
Break out Turn and Climb Procedure....B
Break out Turn and Descent Procedure....C

ETOPS CRITICAL FUEL RESERVES

Ident.: PRO-SPO-40A-00023706.0001001 / 03 NOV 21
Applicable to: ALL

ICING

The most critical scenario must be compensated for the greater of:

A. The effect of airframe icing during 10 % of the time during which icing is forecast, including ice accumulation on unprotected surfaces, and the fuel used by engine and wing anti-ice during this period.

B. Fuel for engine and wing anti-ice for the entire time during which icing is forecast.

Note: *The ETOPS icing fuel reserve is always limited by (B).*

Unless a reliable icing forecast is available, icing may be presumed to occur when the Total Air Temperature is less than +10 °C (50 °F), or if the outside air temperature is between 0 °C (32 °F) and -20 °C (-4 °F) with a relative humidity of 55 % or more.

APU

Fuel consumption of 130 kg/h or 287 lb/h (APU GEN ON, APU BLEED OFF).
In view of our experience, Airbus recommends that the operator includes a contingency fuel provision from departure to the Critical Point, when computing the ETOPS critical fuel planning.

DIVERSION DECISION MAKING

Ident.: PRO-SPO-40A-00023707.0001001 / 03 NOV 22
Applicable to: ALL

The technical criteria governing a re-routing or diversion decision can be classified into five categories, as follows:

- Loss of NAT-HLA capability, before entering the NAT-HLA area (as applicable)
- Weather minima at diversion airport(s) going below the company/crew en-route minima, before reaching the ETOPS Entry Point, or diversion airport(s) becoming unsuitable for any reason
- Failure cases requiring a diversion to the nearest airport (cases leading to a LAND ASAP message on the ECAM and/or in the QRH)
- Failure cases resulting in increased fuel consumption, exceeding the available fuel reserves
- Electrical generation.
  Diversion is required in the case of:
  - Only one generator (either one IDG, APU GEN or EMER GEN) remaining available following a multiple failure, or
  - Only one main generator (either one IDG or APU GEN) remaining available, and low level, low pressure or overheat on the green hydraulic circuit.

Comments and recommendations

- Fuel system
  Some failure cases may lead to fuel gravity feeding which implies flight at lower altitude or to some fuel being unusable. The flight crew's evaluation of the actual situation and the fuel remaining may lead to the decision that a diversion is required.

ABNORMAL AND EMERGENCY PROCEDURES

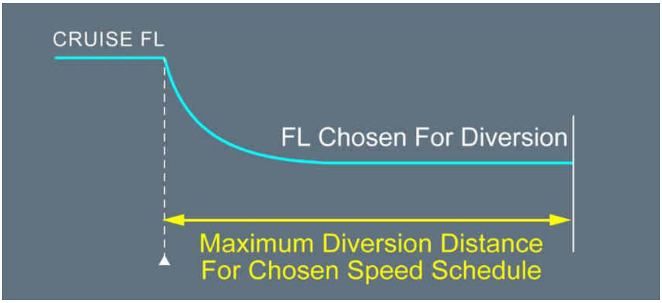
Ident.: PRO-SPO-40A-00023708.0001001 / 17 NOV 20
Applicable to: ALL

The procedures given in the EASA approved Airbus ETOPS CMP document are applicable.
The SOP (refer to chapters PRO, NOR, SOP) and the ABNORMAL and EMERGENCY procedures (refer to chapters PRO, ABN) apply. For ETOPS flights, the following additional procedure apply:
GEN 1 or 2 FAULT

● **When in ETOPS segment :**
APU GEN (if available)...USE

MAXIMUM DIVERSION DISTANCE

Ident.: PRO-SPO-40A-00023709.0018001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU



The following computation takes into account the below conditions:

- ISA conditions
- No wind
- Optimum diversion level after engine failure
- Single engine diversion speed schedule.

Note: *Obstacles have not to be considered to determine if a route is or is not an ETOPS route.*

MAXIMUM DIVERSION DISTANCE							
SPEED SCHEDULE	**A/C WEIGHT AT CRITICAL POINT (KG)**	**FL FOR DIVERSION**	**DIVERSION TIME (MIN)**				
			60	**90**	**120**	**180**	**240**
MCT/330KT	150000	190	440	655	870	1301	
	160000	190	438	652	866	1295	1700(1)
	170000	180	439	651	864	1289	1700(1)
	180000	180	437	650	862	1288	1700(1)
	190000	180	435	646	857	1281	1700(1)
	200000	170	435	644	854	1273	1692
	210000	170	433	642	852	1271	1690
	220000	170	430	637	845	1263	1683
	230000	160	430	637	843	1257	1670
MCT/310KT	150000	210	431	641	850	1269	1688
	160000	210	430	640	849	1268	1687
	170000	210	427	635	843	1261	1680
	180000	200	427	634	840	1253	1666

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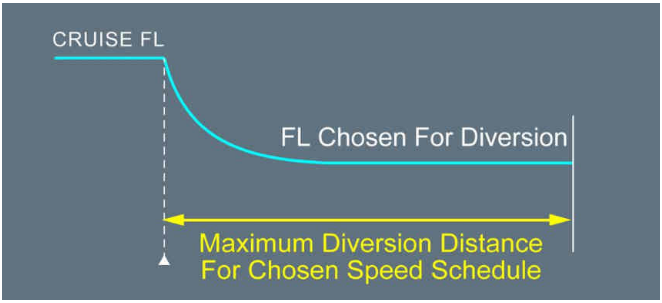
MAXIMUM DIVERSION DISTANCE

SPEED SCHEDULE	A/C WEIGHT AT CRITICAL POINT (KG)	FL FOR DIVERSION	DIVERSION TIME (MIN)				
			60	90	120	180	240
	190000	200	424	630	836	1249	1661
	200000	190	423	626	830	1236	1643
	210000	190	421	624	827	1234	1641
	220000	180	419	619	819	1220	1621
	230000	180	417	617	818	1218	1619
MCT/290KT	150000	220	415	614	814	1213	1613
	160000	220	415	614	814	1213	1612
	170000	220	414	614	814	1213	1612
	180000	220	414	614	813	1213	1612
	190000	220	411	609	808	1208	1607
	200000	210	410	606	803	1196	1590
	210000	200	406	600	793	1181	1568
	220000	200	404	598	792	1179	1567
	230000	190	401	592	783	1164	1546

(1) *The distance is limited by the maximum diversion distance as per AFM. For more information, Refer to AFM/APP/ETOPS/Limitations.*

MAXIMUM DIVERSION DISTANCE

Ident.: PRO-SPO-40A-00023709.0016001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO



The following computation takes into account the below conditions:

- ISA conditions
- No wind
- Optimum diversion level after engine failure
- Single engine diversion speed schedule.

Note: *Obstacles have not to be considered to determine if a route is or is not an ETOPS route.*

MAXIMUM DIVERSION DISTANCE							
SPEED SCHEDULE	A/C WEIGHT AT CRITICAL POINT (KG)	FL FOR DIVERSION	DIVERSION TIME (MIN)				
			60	90	120	180	240
MCT/330KT	150000	190	439	652	866	1294	
	160000	180	438	651	864	1289	1700*(1)*
	170000	180	437	648	861	1286	1700*(1)*
	180000	180	435	645	856	1279	1700*(1)*
	190000	170	434	644	854	1273	1692
	200000	170	432	640	849	1268	1687
	210000	160	431	638	844	1257	1671
	220000	160	429	634	841	1254	1667
	230000	150	427	630	834	1241	1648
MCT/310KT	150000	220	433	644	856	1281	
	160000	210	431	640	850	1269	1688
	170000	210	428	637	846	1265	1684
	180000	200	427	633	839	1252	1665

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MAXIMUM DIVERSION DISTANCE

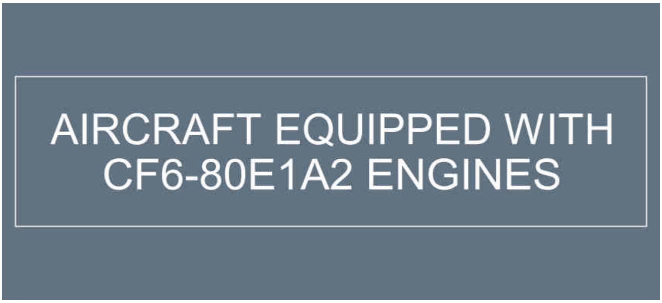
SPEED SCHEDULE	A/C WEIGHT AT CRITICAL POINT (KG)	FL FOR DIVERSION	DIVERSION TIME (MIN)				
			60	90	120	180	240
	190000	200	424	628	834	1247	1659
	200000	190	423	626	829	1236	1643
	210000	190	419	621	824	1231	1637
	220000	180	418	619	819	1220	1620
	230000	180	414	613	812	1213	1614
MCT/290KT	150000	220	414	614	813	1213	1612
	160000	220	414	613	813	1212	1612
	170000	220	414	613	813	1212	1612
	180000	220	413	613	813	1212	1611
	190000	220	413	613	813	1212	1611
	200000	220	409	607	806	1205	1604
	210000	210	407	603	800	1193	1586
	220000	200	404	598	792	1179	1567
	230000	190	401	592	782	1164	1545

(1) *The distance is limited by the maximum diversion distance as per AFM. For more information, Refer to AFM/APP/ETOPS/Limitations.*

GENERAL

Ident.: PRO-SPO-42B-10-00023737.0002001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

This supplement gives the conditions and procedures to operate temporarily an A330-202, initially fitted with CF6-80E1A4 engines, with one or two CF6-80E1A2 engines, provided that the associated SB is installed.
The remaining CF6-80E1A4 engine must be modified and rated as a CF6-80E1A2 engine. Except as amended or supplemented herein, limitations, procedures, performance of this Flight Crew Operating Manual remain applicable.
This engine intermix configuration is indicated in the cockpit with the following placard:



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LIMITATIONS

Ident.: PRO-SPO-42B-20-00023738.0002001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Reduced thrust takeoff and derated takeoff are not allowed.

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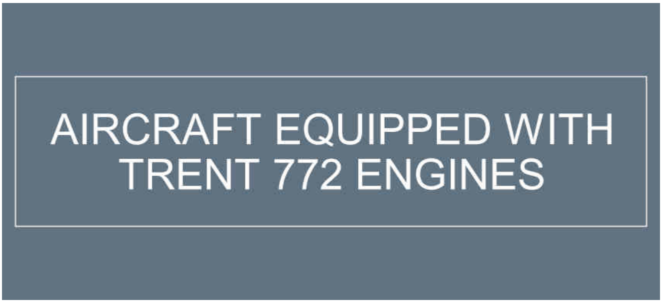
GENERAL

Ident.: PRO-SPO-42C-10-00023739.0003001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

This supplement gives the conditions and procedures to operate temporarily an A330-343, initially fitted with RR 772B engines, with one or two RR 772 engines, provided that the associated SB is installed.
The remaining RR 772B engine must be modified and rated as a RR 772 engine.
Except as amended or supplemented herein, limitations, procedures, performance of this Flight Crew Operating Manual remain applicable.
This engine intermix configuration is indicated in the cockpit with the following placard:



AIRCRAFT EQUIPPED WITH
TRENT 772 ENGINES

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LIMITATIONS

Ident.: PRO-SPO-42C-20-00023740.0003001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

Reduced thrust takeoff and derated takeoff are not allowed.

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GENERAL

Ident.: PRO-SPO-50-00020723.0001001 / 17 MAR 17
Applicable to: ALL

The A330 and A340 aircraft systems are designed to comply with the design criteria of the EASA and FAA regulations (documents references provided in the AFM) for the RVSM capability.
In addition, operators must obtain an operational approval from their national airworthiness authorities, in order to operate within the RVSM airspace. The EASA and FAA regulations (documents references provided in the AFM) also indicate the requirements for obtaining operational approval.

REQUIRED EQUIPMENTS/FUNCTIONS FOR RVSM

Ident.: PRO-SPO-50-00020724.0001001 / 17 MAR 17
Applicable to: ALL

RVSM regulations require the following equipment/functions to be operative :

- 2 ADRs + 2 DMCs
- 1 transponder
- 1 autopilot function
- 1 FCU channel (for altitude target selection and OP CLB/OP DES mode engagement)
- 2 PFD functions (for altitude indication)
- 1 FWC (for altitude alert function).

RVSM NORMAL PROCEDURE

Ident.: PRO-SPO-50-00020726.0001001 / 22 MAR 17
Applicable to: ALL

For flights in RVSM airspace, the flight crew must apply the standard procedures, in addition to the following RVSM procedures.

FLIGHT PREPARATION

The flight crew must take into account the conditions that may affect operations in RVSM airspace, including:

RVSM APPROVAL..CHECK

L2 *Verify that the aircraft is approved for RVSM operations.*

L1 WEATHER..CHECK

L2 *Review the weather forecasted for the flight route. If severe turbulence is expected, this may affect the ability to maintain aircraft altitude.*

L1 REQUIRED EQUIPMENT FOR RVSM ....CHECK

L2 *Check that the required equipment is operative (MEL).*

The flight crew should review the maintenance logs and forms, in order to ensure that the equipment required for RVSM is satisfactory.

L1 ALTITUDES .... CHECK

L2 *Check that the difference between each altitude indications (in the QNH reference) displayed on PFDs and the airport elevation is less than 75 ft.*
Check that the difference between the two primary altitude indications on the PFDs is less than the tolerance specified in the SOP. *Refer to PRO-NOR-SOP-06 Glareshield - EFIS Control Panel.*

L1 IN FLIGHT

BEFORE ENTERING RVSM AIRSPACE

REQUIRED EQUIPMENT FOR RVSM .... OPERATIVE

L2 *If any of the required equipment fails before the aircraft enters RVSM airspace, the flight crew must request new clearance, to avoid this airspace.*

L1 ALTITUDES .... CHECK

L2 *Check on the PFDs that the difference between the altitude indications (in the standard baro setting) is less than the specified tolerance in the table below.*
If only two ADRs are operative, the altimeter indications on PFD and standby altimeter should be recorded. This information may be useful in case of subsequent PFD altitude discrepancy or loss of both remaining ADRs.

L1

		Comparison of Altitude Indications (ft)		
Flight Level	**Speed or Mach Number**	**Difference between ADR 1 and ADR 2 (on PFDs)**	**Difference between ADR 3 and ADR 1/2 (on PFDs)**	**Difference between STBY ALT and ADRs (on PFDs)**
FL 50	250 kt	55 (17 m)	55 (17 m)	90 (27 m)
FL 100	250 kt	60 (18 m)	60 (18 m)	130 (40 m)
FL 200	300 kt	95 (29 m)	100 (30 m)	220 (67 m)
FL 300	M 0.82	120 (37 m)	130 (40 m)	320 (98 m)
FL 410	M 0.82	145 (44 m)	150 (46 m)	380 (116 m)

IN RVSM AIRSPACE

AP .... KEEP ENGAGED

L2 *Ensure that autopilot is engaged for cruise, and for flight level changes.*

L1 AP GUIDANCE .... MONITOR

L2 *During flight level transitions, do not exceed or go below the assigned flight level by more than 150 ft.*

L1

- **Approximately every hour:**
  ALTITUDES .... CHECK

L2 *Check that the difference between the altitude on PFDs is less than the specified tolerance. For more information, See the above "Comparison or Altitude Indications" table.*

Regular check of the flight deck instruments should be sufficient.

L1 AT THE END OF THE FLIGHT

ANY MALFUNCTIONS or DEVIATIONS...REPORT

L2 *Report any malfunction of the systems that enable the aircraft to maintain altitude, including:*
- *Any malfunction or loss of required equipment*
- *Any deviation involving the functions that enable the aircraft to maintain altitude.*

RVSM ABNORMAL AND EMERGENCY PROCEDURE

Ident.: PRO-SPO-50-00020727.0001001 / 17 MAR 17
Applicable to: ALL

ATC...NOTIFY

When the aircraft is in RVSM airspace, the flight crew must notify the ATC of the following situations, because they may affect the aircraft's ability to maintain the flight level:
- *The failure of both autopilots*
- *The loss of altimeter system redundancy (only one PFD indication remaining)*
- *An excessive discrepancy in altitude indications, and no way to identify the valid indication*
- *The failure of any other equipment, that affects the aircraft's ability to maintain the flight level*
- *The encounter of greater than moderate turbulence.*

If the flight crew cannot notify the ATC or obtain the ATC clearance before deviating from the assigned flight level, they should follow the established contingency procedure and obtain the ATC clearance as soon as possible.

Intentionally left blank

GENERAL

Applicable to: ALL

Ident.: PRO-SPO-51-A-00015657.0001001 / 21 MAR 17

GENERAL

The Performance Based Navigation (PBN) concept implies that the aircraft follows the defined track with a requested navigation performance. The PBN includes RNAV and RNP operations.
For RNAV and RNP operations, an operational approval from the airline's national authorities may be required.
The AFM provides regulatory compliances associated with PBN operations.

Ident.: PRO-SPO-51-A-00015659.0001001 / 09 SEP 14

RNAV/RNP CAPABILITY

Before the aircraft enters an RNAV/RNP airspace, RNAV/RNP capability is based on:
- The required RNAV/RNP equipment that is described in each RNAV/RNP section of the FCOM
- Navigation Accuracy HIGH displayed on the MCDU PROG page
- Any specific local requirements published in the Aeronautical Information Publication (AIP).

When the aircraft flies in RNAV/RNP airspace, RNAV/RNP capability is based on:
- Navigation Accuracy HIGH displayed on the MCDU PROG page
- Any specific local requirements published in the Aeronautical Information Publication (AIP).

RNAV 10 / RNP 10

Applicable to: ALL

Ident.: PRO-SPO-51-B-00015675.0001001 / 09 SEP 14

GENERAL

RNAV 10 operations correspond to RNP 10 operations.
In RNAV 10 airspace, the aircraft is expected to fly for a long period of time outside radio navaid coverage.

Ident.: PRO-SPO-51-B-00015676.0001001 / 10 MAY 21

REQUIRED RNAV 10 EQUIPMENT

The minimum navigation equipment required to enter RNAV 10 airspace is:
- Two FMGECs (or one FMGEC and one BACK UP NAV)
- Two MCDUs
- Two IRS

- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side)
- One GPS if the flight time outside radio navaid coverage is longer than:
  - 6.2 hr from the time of IRS ground alignment, or
  - 5.7 hr from the time of the last FM position update.

Ident.: PRO-SPO-51-B-00015756.0001001 / 21 MAR 17

PROCEDURE

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**
  - GPS PRIMARY LOST ◁ on one ND/MCDU
  - NAV ACCUR DOWNGRAD on one ND/MCDU.
- **If the GPS PRIMARY LOST ◁ message is displayed on both NDs/MCDUs, RNAV 10 operations can be continued:**
  - With no time restriction if radio navaids update is available
  - For 5.7 hr from the time of the last position update if radio navaids update is not available. After 5.7 hr, the navigation accuracy must be considered LOW regardless of the navigation accuracy that is displayed on the MCDU PROG page.
- **If one of the following MCDU or ECAM messages is displayed, the flight crew should crosscheck the position data using the POSITION MONITOR page, the IRS 1(2)(3) pages, and the GPS MONITOR page ◁ in order to identify which FMGEC position is correct:**
  - FMS 1/FMS 2 POS DIFF
  - CHECK IRS 1(2)(3)/FM POSITION ◁
  - CHECK A/C POSITION ◁
  - NAV FM/GPS POS DISAGREE ◁

  The flight crew should resume navigation with the FMGEC that provides the correct position.
- **If NAV ACCUR DOWNGRAD is displayed on both sides:**
  - As per design FMS REQ ACCUR is set by default; this default value (e.g. 2 NM in cruise, 1 NM in terminal area) is more restrictive than overflown airspace required navigation performance.
  - Any change on FMS REQ ACCUR to be in accordance with airspace requirement is at flight crew's discretion; and should be set back to default value when leaving intended airspace.

If NAV ACCUR DOWNGRAD remains displayed, the flight crew should inform ATC that the RNAV 10 capability is lost.

RNAV 5 / BRNAV

Applicable to: ALL

Ident.: PRO-SPO-51-C-00015672.0001001 / 21 MAR 17

GENERAL

RNAV 5 operations correspond to European BRNAV operations.

Ident.: PRO-SPO-51-C-00015673.0001001 / 10 MAY 21

REQUIRED RNAV 5 EQUIPMENT

The minimum navigation equipment required to enter RNAV 5 airspace is:

- One FMGEC
- One MCDU
- One GPS or one DME receiver to update FM position
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side)
- One IRS.

Ident.: PRO-SPO-51-C-00015757.0001001 / 24 NOV 23

PROCEDURE

MANAGEMENT OF DEGRADED NAVIGATION

● **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**

- GPS PRIMARY LOST ◁ on one ND/MCDU
- NAV ACCUR DOWNGRAD on one ND/MCDU.

● **If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGEC position is correct:**

- GPS PRIMARY LOST ◁ on both NDs/MCDUs
- FMS1/FMS2 POS DIFF
- CHECK IRS 1(2)(3)/FM POSITION ◁
- CHECK A/C POSITION ◁
- NAV FM/GPS POS DISAGREE ◁ .

The flight crew should resume navigation with the FMGEC that provides the correct position.

- **If NAV ACCUR DOWNGRAD is displayed on both sides:**
  - As per design FMS REQ ACCUR is set by default; this default value (e.g. 2 NM in cruise, 1 NM in terminal area) is more restrictive than overflown airspace required navigation performance.
  - Any change on FMS REQ ACCUR to be in accordance with airspace requirement is at flight crew's discretion; and should be set back to default value when leaving intended airspace.

  If NAV ACCUR DOWNGRAD remains displayed, the flight crew should inform ATC that the RNAV 5 capability is lost.

RNAV 1 RNAV 2 / P-RNAV - TERMINAL RNAV

Applicable to: ALL

Ident.: PRO-SPO-51-D-00015669.0001001 / 21 MAR 17

GENERAL

RNAV 1(2) operations correspond to P-RNAV TERMINAL RNAV operations.
The AIP may specify that GPS equipment is required.

Ident.: PRO-SPO-51-D-00015670.0001001 / 10 MAY 21

REQUIRED RNAV 1(2) EQUIPMENT

The minimum navigation equipment required to enter RNAV 1/RNAV 2 airspace is:
- One FMGEC
- One MCDU
- One GPS or one DME receiver to update the FM position
- Two IRS
- One FD in NAV mode
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-D-00015758.0001001 / 24 NOV 23

PROCEDURE

BEFORE ENTERING RNAV 1(2) AIRSPACE

The FMS navigation database provides the terminal procedure (RNAV SID, RNAV STAR, RNAV TRANSITION, etc.) of the flight plan. The flight crew must crosscheck the terminal procedure from the published charts with the FMS navigation database on the F-PLN page (waypoint sequences, tracks, distances, and altitude or speed constraints). The flight crew must not modify the procedure that is provided by the navigation database, unless required by the ATC (DIR TO radar vectoring, insertion of waypoints from the navigation database).

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**
  - GPS PRIMARY LOST on one ND/MCDU
  - NAV ACCUR DOWNGRAD on one ND/MCDU.
- **If one of the following messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGEC position is correct:**
  - GPS PRIMARY LOST on both NDs/MCDUs
  - FMS1/FMS2 POS DIFF
  - CHECK IRS 1(2)(3)/FM POSITION
  - CHECK A/C POSITION
  - NAV FM/GPS POS DISAGREE .

  The flight crew should resume navigation with the FMGEC that provides the correct position.
- **If NAV ACCUR DOWNGRAD is displayed on both sides:**

  The flight crew should inform the ATC that the RNAV 1(2) capability is lost.

RNP 4

Applicable to: ALL

Ident.: PRO-SPO-51-E-00015666.0001001 / 09 SEP 14

GENERAL

In this airspace, the aircraft is expected to fly for a long period of time outside radio navaid coverage.

Ident.: PRO-SPO-51-E-00015667.0001001 / 10 MAY 21

REQUIRED RNP 4 EQUIPMENT

The minimum navigation equipment required to enter RNP 4 airspace is:
- Two FMGECs (or one FMGEC and one BACK UP NAV)
- Two MCDUs
- Two IRS
- One GPS
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-E-00015759.0001001 / 21 MAR 17

PROCEDURE

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**
  - GPS PRIMARY LOST on one ND/MCDU
  - NAV ACCUR DOWNGRAD on one ND/MCDU.
- **If one of the following MCDU or ECAM messages is displayed, the flight crew should crosscheck the position data using the POSITION MONITOR page, the IRS 1(2)(3) pages, and the GPS MONITOR page in order to identify which FMGEC position is correct:**
  - GPS PRIMARY LOST on both NDs/MCDUs
  - FMS1/FMS2 POS DIFF
  - CHECK IRS 1(2)(3)/FM POSITION ⊲
  - CHECK A/C POSITION ⊲
  - NAV FM/GPS POS DISAGREE

  The flight crew should resume navigation with the FMGEC that provides the correct position.
- **If NAV ACCUR DOWNGRAD is displayed on both sides:**
  - As per design FMS REQ ACCUR is set by default; this default value (e.g. 2 NM in cruise, 1 NM in terminal area) is more restrictive than overflown airspace required navigation performance.
  - Any change on FMS REQ ACCUR to be in accordance with airspace requirement is at flight crew's discretion; and should be set back to default value when leaving intended airspace.

  If NAV ACCUR DOWNGRAD remains displayed, the flight crew should inform ATC that the RNP 4 capability is lost.

RNP 2 IN OCEANIC AND REMOTE CONTINENTAL AREA

Applicable to: ALL

Ident.: PRO-SPO-51-I-00021313.0001001 / 21 MAR 17

GENERAL

In this airspace, the aircraft is expected to fly for a long period of time outside radio navaid coverage.

Ident.: PRO-SPO-51-I-00021314.0001001 / 10 MAY 21

REQUIRED RNP 2 IN OCEANIC AND REMOTE CONTINENTAL AREA EQUIPMENT

The minimum navigation equipment required to enter RNP 2 oceanic and remote continental airspace is:

- Two FMGECs (or one FMGEC and one BACK UP NAV)
- Two MCDUs
- Two IRS
- One GPS
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-I-00021315.0001001 / 21 MAR 17

PROCEDURE

FLIGHT PREPARATION

RAIM/AIME availability should be confirmed for RNP 2 in oceanic and remote continental area operations.

Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**
  - GPS PRIMARY LOST on one ND/MCDU
  - NAV ACCUR DOWNGRAD on one ND/MCDU.

- **If one of the following MCDU or ECAM messages is displayed, the flight crew should crosscheck the position data using the POSITION MONITOR page, the IRS 1(2)(3) pages, and the GPS MONITOR page in order to identify which FMGEC position is correct:**
  - GPS PRIMARY LOST on both NDs/MCDUs
  - FMS 1/FMS 2 POS DIFF
  - CHECK IRS 1(2)(3)/FM POSITION ◁
  - CHECK A/C POSITION ◁
  - NAV FM/GPS POS DISAGREE

  The flight crew should resume navigation with the FMGEC that provides the correct position.

- **If NAV ACCUR DOWNGRAD is displayed on both sides:**

  The flight crew should inform ATC that the RNP 2 capability is lost.

RNP 2 IN DOMESTIC AREA

Applicable to: ALL

Ident.: PRO-SPO-51-J-00021316.0001001 / 10 MAY 21

REQUIRED RNP 2 IN DOMESTIC AREA EQUIPMENT

The minimum navigation equipment required to enter RNP 2 domestic airspace is:

- One FMGEC
- One MCDU
- One GPS
- Two IRS
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-J-00021317.0001001 / 24 NOV 23

PROCEDURE

FLIGHT PREPARATION

RAIM/AIME availability should be confirmed for RNP 2 in domestic area operations.
Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**
  - GPS PRIMARY LOST ◁ on one ND/MCDU
  - NAV ACCUR DOWNGRAD on one ND/MCDU.
- **If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGEC position is correct:**
  - GPS PRIMARY LOST ◁ on both NDs/MCDUs
  - FMS1/FMS2 POS DIFF
  - CHECK IRS 1(2)(3)/FM POSITION ◁
  - CHECK A/C POSITION ◁
  - NAV FM/GPS POS DISAGREE ◁ .

  The flight crew should resume navigation with the FMGEC that provides the correct position.
- **If NAV ACCUR DOWNGRAD is displayed on both sides:**

  The flight crew should inform ATC that the RNP 2 capability is lost.

RNP 1 / TERMINAL RNP 1 - BASIC RNP 1

Applicable to: ALL

Ident.: PRO-SPO-51-F-00015660.0001001 / 21 MAR 17

GENERAL

RNP 1 operations correspond to RNP 1 Terminal operations.

Ident.: PRO-SPO-51-F-00015662.0001001 / 10 MAY 21

REQUIRED RNP 1 EQUIPMENT

The minimum navigation equipment required to enter RNP1 airspace is:

- One FMGEC
- One MCDU
- One GPS
- Two IRS
- One FD in NAV mode
- Two NDs (the temporary display of ND information via the PFD/ND sw is permitted on PM side).

Ident.: PRO-SPO-51-F-00015762.0001001 / 24 NOV 23

PROCEDURE

FLIGHT PREPARATION

RAIM/AIME availability should be confirmed for RNP 1 operations.
Refer to PRO-NOR-SOP-02 GPS PRIMARY Availability (If Installed)

BEFORE ENTERING RNP 1 AIRSPACE

The FMS navigation database provides the terminal procedure (RNAV SID, RNAV STAR, RNAV TRANSITION, etc.) of the flight plan. The flight crew must check the terminal procedure from the published charts with the FMS navigation database on the F-PLN page (waypoint sequences, tracks, distances, and altitude or speed constraints). The flight crew must not modify the procedure that is provided by the navigation database, unless required by the ATC (DIR TO, radar vectoring, insertion of waypoints from the navigation database).

MANAGEMENT OF DEGRADED NAVIGATION

- **If one of the following messages is displayed, the flight crew should resume navigation with the FMGEC that provides the correct position:**
  - GPS PRIMARY LOST ◁ on one ND/MCDU
  - NAV ACCUR DOWNGRAD on one ND/MCDU.

- **If one of the following MCDU or ECAM messages is displayed, the flight crew should check the position data via the MCDU PROG page in order to identify which FMGEC position is correct:**
  - GPS PRIMARY LOST on both NDs/MCDUs
  - FMS1/FMS2 POS DIFF
  - CHECK IRS 1(2)(3)/FM POSITION
  - CHECK A/C POSITION
  - NAV FM/GPS POS DISAGREE .

  The flight crew should resume navigation with the FMGEC that provides the correct position.

- **If NAV ACCUR DOWNGRAD is displayed on both sides:**

  The flight crew should inform the ATC that the RNP 1 capability is lost.

RNP APCH / RNAV(GNSS)

Applicable to: ALL

Ident.: PRO-SPO-51-G-00015654.0001001 / 21 MAR 17

GENERAL

RNP APCH operations correspond to RNAV(GNSS) or RNAV(GPS) operations.

Ident.: PRO-SPO-51-G-00015652.0001001 / 11 JUL 17

REQUIRED RNP APCH EQUIPMENT

The minimum equipment required to start RNP APCH operations is:
- One FMGEC
- One GPS
- One MCDU
- Two IRS
- One FD
- One PFD on the PF side
- Two NDs (the temporary display of ND information via the PFD/ND switch is permitted on the PM side)
- Two FCU channels.

Ident.: PRO-SPO-51-G-00015768.0001001 / 10 MAY 21

PROCEDURE

Refer to PRO-NOR-SOP-18-C Approach using FINAL APP Guidance - General.

Refer to PRO-NOR-SOP-18-C Approach using FPA Guidance - General.

RNP AR / RNAV(RNP)

Ident.: PRO-SPO-51-H-00012751.0002001 / 09 MAY 17
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

RNP AR operations correspond to RNAV(RNP) operations.
For RNP AR operations, the flight crew should refer to the specific procedures published by the airline.
The airline must obtain an operational approval and the flight crew must be qualified for this type of operations. To obtain this operational approval the airline should refer to the AFM and the associated Airworthiness Compliance Document (ACD). The approved RNP values are given in the AFM and the ACD.
The main procedure steps for RNP AR have been introduced in the Procedures of this FCOM and in the paragraph below. This does not relieve the airline from the need to provide the flight crew with tailored procedures when required.

Ident.: PRO-SPO-51-H-00012752.0002001 / 03 NOV 22
Applicable to: LV-KHT, LV-KHU

REQUIRED RNP AR EQUIPMENT

The minimum equipment required to start RNP AR operations is:
- 2 FMGEC
- 2 MCDU
- 2 FD
- 1 AP at least
- 2 PFD with V/DEV displays
- 2 ND
- 2 GPS (MMR)
- 3 ADIRS in NAV mode
- TAWS with display of terrain
- FCU with both channels
- 1 FWC

Ident.: PRO-SPO-51-H-00012752.0003001 / 03 NOV 22
Applicable to: LV-KAN, LV-KAO

REQUIRED RNP AR EQUIPMENT

The minimum equipment required to start RNP AR operations is:
- 2 FMGEC
- 2 MCDU

- 2 FD
- 1 AP (2 AP if RNP less than 0.3 is required or missed approach less than 1 NM)
- 2 PFD with L/DEV and V/DEV displays
- 2 ND
- 2 GPS (MMR)
- 3 ADIRS in NAV mode
- TAWS with display of terrain
- FCU with both channels
- 1 FWC

Ident.: PRO-SPO-51-H-00014562.0004001 / 24 FEB 23
Applicable to: LV-KAN, LV-KAO

PROCEDURES

The availability of GPS PRIMARY for the estimated time of operation must be verified with an appropriate GPS prediction tool before dispatch.

Prior to starting RNP AR instrument procedures, check that:
- OAT and wind, as applicable, are within limits
- The FMS lateral and vertical F-PLN extracted from the navigation database is in accordance with the instrument procedure chart
- Two GPS sensors are in NAV or SBAS ◁* on GPS MONITOR page
- The correct RNP value is displayed on MCDU with HIGH accuracy
- GPS PRIMARY is available.

If obstacles, GPWS TERRAIN display must be selected on both ND unless weather radar monitoring is required on one side.
Airspeed and configuration must be adapted for the radius of turns in the procedure.

DEPARTURE

Before takeoff, check that NAV is armed.
When NAV is indicated active on FMA and at 100 ft, select AP ON.
Monitor lateral deviation using the L/DEV on PFD.
Callout must be performed when L/DEV reaches ½ dot.
If L/DEV increases towards 1 RNP, take over manually using FD and the L/DEV indication to fly back on the intended flight plan and reengage AP as applicable.

APPROACH

Refer to FCOM-PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNAV(RNP) - General.

GO-AROUND

Refer to FCOM-PRO-NOR-SOP-20 Go Around - Go Around Initiation.

ABNORMAL OPERATIONS

Detailed information is provided in the ACD for the airline to develop contingency procedures adapted to each operation.
The flight crew must be trained to conduct departure or missed approach procedures with system failures to ensure a safe extraction.

ENGINE FAILURE

In the case of engine failure during departure or a missed approach procedure, the flight crew must consider the bank angle limitation when flying at a speed below the maneuvering speed. Turns in the procedure may require bank angles above 15 °. Flying with one engine inoperative affects the aircraft lateral performance. The flight crew should be trained and instructed to disconnect AP if the aircraft deviates from the intended track. This training must consider turning and straight legs as appropriate.

Ident.: PRO-SPO-51-H-00014562.0003001 / 24 FEB 23
Applicable to: LV-KHT, LV-KHU

PROCEDURES

The availability of GPS PRIMARY for the estimated time of operation must be verified with an appropriate GPS prediction tool before dispatch.

Prior to starting RNP AR instrument procedures, check that:
- OAT and wind, as applicable, are within limits
- The FMS lateral and vertical F-PLN extracted from the navigation database is in accordance with the instrument procedure chart
- Two GPS sensors are in NAV or SBAS ◁✻ on GPS MONITOR page
- The correct RNP value is displayed on MCDU with HIGH accuracy
- GPS PRIMARY is available.

If obstacles, GPWS TERRAIN display must be selected on both ND unless weather radar monitoring is required on one side.
Airspeed and configuration must be adapted for the radius of turns in the procedure.

DEPARTURE

Before takeoff, check that NAV is armed.
When NAV is indicated active on FMA and at 100 ft, select AP ON.
Monitor lateral deviation using the XTK on ND.
Callout must be performed when XTK is at or above 0.1 NM.

If XTK increases towards 1 RNP, take over manually using FD indication to fly back on the intended flight plan and using ND and XTK to reengage AP as applicable.

APPROACH

Refer to FCOM-PRO-NOR-SOP-18-C Approach using FINAL APP Guidance for RNAV(RNP) - General.

GO-AROUND

Refer to FCOM-PRO-NOR-SOP-20 Go Around - Go Around Initiation.

ABNORMAL OPERATIONS

Detailed information is provided in the ACD for the airline to develop contingency procedures adapted to each operation.
The flight crew must be trained to conduct departure or missed approach procedures with system failures to ensure a safe extraction.

ENGINE FAILURE

In the case of engine failure during departure or a missed approach procedure, the flight crew must consider the bank angle limitation when flying at a speed below the maneuvering speed. Turns in the procedure may require bank angles above 15 °. Flying with one engine inoperative affects the aircraft lateral performance. The flight crew should be trained and instructed to disconnect AP if the aircraft deviates from the intended track. This training must consider turning and straight legs as appropriate.

GENERAL

Ident.: PRO-SPO-52-00021947.0001001 / 09 FEB 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

GENERAL

The Performance-Based Communication and Surveillance (PBCS) concept provides performance requirements for communication and surveillance operations. PBCS supports the required performance for Air Traffic Management (ATM).

The PBCS concepts sets the following performance parameters:
- The Required Communication Performance (RCP) specification that defines performance requirements associated to a communication transaction.
  A communication transaction is performed between the ATC controller and the flight crew (clearance, flight information, or request).
  Performance requirements are specified for each part of the communication chain (aircraft, air/ground network, and ATC).
  The RCP specification impacts CPDLC and SATCOM voice communications on the aircraft.
  The RCP specification is identified by a designator (e.g. RCP 240, RCP 400) where the value refers to the maximum time (in seconds) for the ATC controller to initiate an ATC clearance and receive the response from the flight crew.
- The Required Surveillance Performance (RSP) specification that defines performance requirements associated to the delivery of surveillance data.
  Performance requirements are specified for each part of the communication chain (aircraft, air/ground network, and ATC).
  The RSP specification impacts ADS-C and SATCOM voice communications on the aircraft.
  The RSP specification is identified by a designator (e.g. RSP 180, RSP 400) where the value refers to a maximum time (in seconds) to deliver the surveillance data (e.g. aircraft position) to the ATC.

The RCP and/or RSP specifications apply to a defined airspace, route, or procedure with optimized operations (e.g. reduced separations).

REQUIREMENTS

Ident.: PRO-SPO-52-00021948.0001001 / 09 FEB 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Aircraft Performance Capability for Communication and Surveillance	Required Onboard Configuration to Maintain Aircraft Performance Capability	
	Applications that Support Aircraft Performance Capability	**Communication Means that Support Applications**
RCP 240	CPDLC	VHF datalink or SATCOM datalink
RSP 180	ADS-C	VHF datalink or SATCOM datalink

PROCEDURE

Ident.: PRO-SPO-52-00021949.0001001 / 09 FEB 18
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

MANAGEMENT OF DEGRADED DATALINK COMMUNICATION AND SURVEILLANCE

In PBCS airspace with RCP/RSP requirements, if the ATC datalink application or the communication means associated to a required RCP/RSP level are lost, the flight crew should notify ATC that RCP and/or RSP capability are lost.

OVERVIEW

Ident.: PRO-SPO-85-00020619.0001001 / 28 NOV 19
Applicable to: ALL

Simultaneous Parallel Approach operations permit ILS/RNAV(GNSS)/RNAV(RNP)/GLS instrument approaches to be performed to dual or triple parallel runway configurations.

Two types of simultaneous approaches to parallel or near-parallel instrument runways exist:
- Independent Approaches, where radar separation minima between aircraft on adjacent extended runway center lines are not prescribed and approaches are monitored to ensure aircraft do not enter a No Transgression Zone (NTZ). A Precision Runway Monitor (PRM) system which enables simultaneous close parallel approaches may also be employed. The air traffic controllers use the PRM system to monitor the aircraft position.
- Dependent Approaches, where radar separation minima between aircraft on adjacent extended runway center lines are prescribed and aircraft are staggered to provide separation from the adjacent final course.

To perform Simultaneous Parallel Approach operations:

- The ATC and flight crew must satisfy specific training requirements.
- The ATC and the aircraft equipment must also comply with specific requirements.

BREAK OUT TURN AND CLIMB PROCEDURE

Ident.: PRO-SPO-85-00020620.0001001 / 17 MAR 17
Applicable to: ALL

Simultaneously:

AP.. OFF
BREAK OUT LEFT(RIGHT), HDG___, ALT___.. ANNOUNCE
THRUST LEVERS..TOGA, and back to CL

L2 *The SRS GA and the GA TRK modes engage. The THR CLB mode engages.*
The speed is managed. The speed target is the aircraft speed at SRS GA engagement.
The FMS GO-AROUND phase becomes active. Thus, the FMS reinserts the approach.

L1 TURN LEFT(RIGHT) AND CLIMB

L2 *As the situation is urgent, the flight crew should temporarily disregard the FD orders.*

Then

L1 HDG___ .... TURN AND PULL

L2 *The GA TRK mode disengages, and the HDG mode engages.*

L1 ALT___ .... TURN AND PULL

L2 *The SRS GA mode disengages, and the OP CLB mode engages. The speed target becomes the FMS speed target of the CLIMB phase.*

L1 SPEED .... PULL AND ADJUST

L2 *For the initial break out procedure, adjust the speed (e.g. 160 kt), in order to avoid a significant acceleration, and an increase in workload.*

L1 ● **When established on the break out path:**

AP .... ON

L2 *Before engaging the AP, ensure that the FD bar orders correspond to the aircraft current path.*

L1 SPEED .... SELECT AS RQRD

FLAPS .... AS RQRD

GEAR .... AS RQRD

TCAS MODE SEL .... TA/RA AS RQRD

BREAK OUT TURN AND DESCENT PROCEDURE

Ident.: PRO-SPO-85-00020621.0001001 / 04 DEC 18

Applicable to: ALL

Simultaneously:

AP .... OFF

BREAK OUT LEFT(RIGHT), HDG___, ALT___ .... ANNOUNCE

TURN LEFT(RIGHT) AND MAINTAIN RATE OF DESCENT

L2 *As the situation is urgent, the flight crew should temporarily disregard the FD orders.*

Then

L1 HDG___.. TURN AND PULL

L2 *The HDG mode engages. The vertical mode reverts to the V/S mode. The vertical speed target is the aircraft vertical speed at V/S engagement.*

L1 ALT___.. TURN AND PULL

L2 *This action defines an altitude target. The OP DES mode and the THR IDLE mode engage. The speed target does not change.*

L1 V/S.. MONITOR

CAUTION	*Depending on the speed target, the vertical speed may become excessive. If the rate of descent exceeds 1 000 ft/min, engage the V/S mode and limit the rate of descent to 1 000 ft/min.*

- **When established on the break out path:**

  AP.. ON

L2 *Before engaging the AP, ensure that the FD bar orders correspond to the aircraft current path.*

L1
- **When cleared by ATC:**

  ALT___.. TURN

L2 *Select an altitude target for go-around, in accordance with the ATC clearance.*

L1 THRUST LEVERS.. TOGA, and back to CL

L2 *The SRS GA and the GA TRK modes engage. The THR CLB mode engages.*
The speed is managed. The speed target is the aircraft speed at SRS GA engagement.
The FMS GO-AROUND phase becomes active.

L1 HDG___.. PULL

L2 *The GA TRK mode disengages, and the HDG mode engages. The SRS GA mode remains engaged, until ALT* engagement.*

L1 SPEED.. SELECT AS RQRD
FLAPS.. AS RQRD
GEAR.. AS RQRD
TCAS MODE SEL.. TA/RA AS RQRD

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LIMITATIONS

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LIM-INT Introduction

LIM-AG Aircraft General

LIM-AIR Air Bleed/Cond/Press/Vent

LIM-AFS Auto Flight System

LIM-APU Auxiliary Power Unit

LIM-CAB Cabin Systems

LIM-COM Communications

LIM-ENG Engines

LIM-F_CTL Flight Controls

LIM-FUEL Fuel

LIM-ICE_RAIN Ice and Rain Protection

LIM-LG Landing Gear

LIM-NAV Navigation

LIM-OXY Oxygen

LIM-ROW_ROP ROW/ROP

LIM-SURV Surveillance

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LIMITATIONS

PRELIMINARY PAGES

LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

M	Localization	DU Title	DU identification	DU date

No Temporary Documentary Unit

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LIMITATIONS

INTRODUCTION

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LIMITATIONS

INTRODUCTION

PRELIMINARY PAGES - TABLE OF CONTENTS

Introduction......A

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INTRODUCTION

Ident.: LIM-INT-00019985.0001001 / 04 SEP 17
Applicable to: ALL

This FCOM chapter contains operational limitations, related to the aircraft and associated systems. All references to airspeed, Mach and altitude relate to indicated airspeed, indicated Mach, and pressure altitude unless otherwise noted.

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LIMITATIONS

AIRCRAFT GENERAL

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LIM-AG-F_CTL Flight Maneuvering Load Acceleration Limits

Flight Maneuvering Load Acceleration Limits.. A

LIM-AG-OPS Operational Parameters

Environmental Envelope.. A
Airport Operations and Wind Limitations.. B

LIM-AG-SPD Speeds

Cockpit Window Open Maximum Speed.. A
Maximum Flaps/Slats Speeds.. B
Maximum Operating Speed VMO/MMO.. C
Maximum Speeds with the Landing Gear Extended.. D
Maximum Tire Speed.. E
Minimum Control Speeds.. F
Wipers Maximum Operating Speed.. G

LIM-AG-WGHT Weights

Weight Limitations.. A

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FLIGHT MANEUVERING LOAD ACCELERATION LIMITS

Ident.: LIM-AG-F_CTL-00020995.0001001 / 17 MAR 17
Applicable to: ALL

Clean configuration....................-1 g to +2.5 g
Other configurations....................0 g to +2 g

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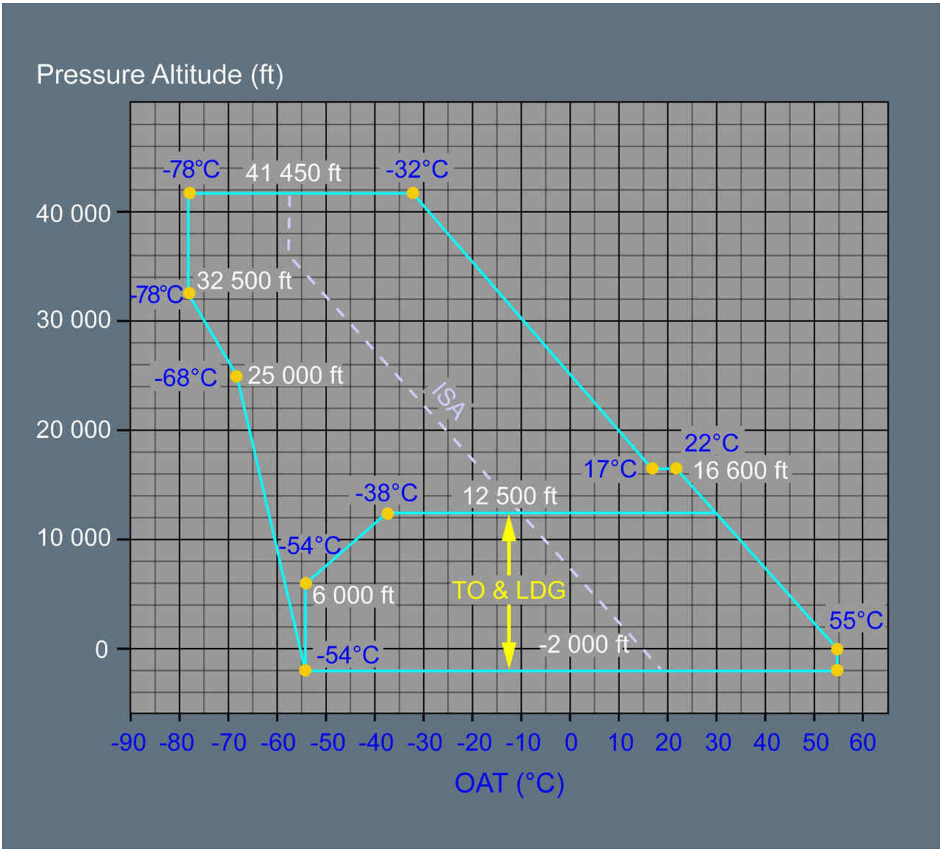
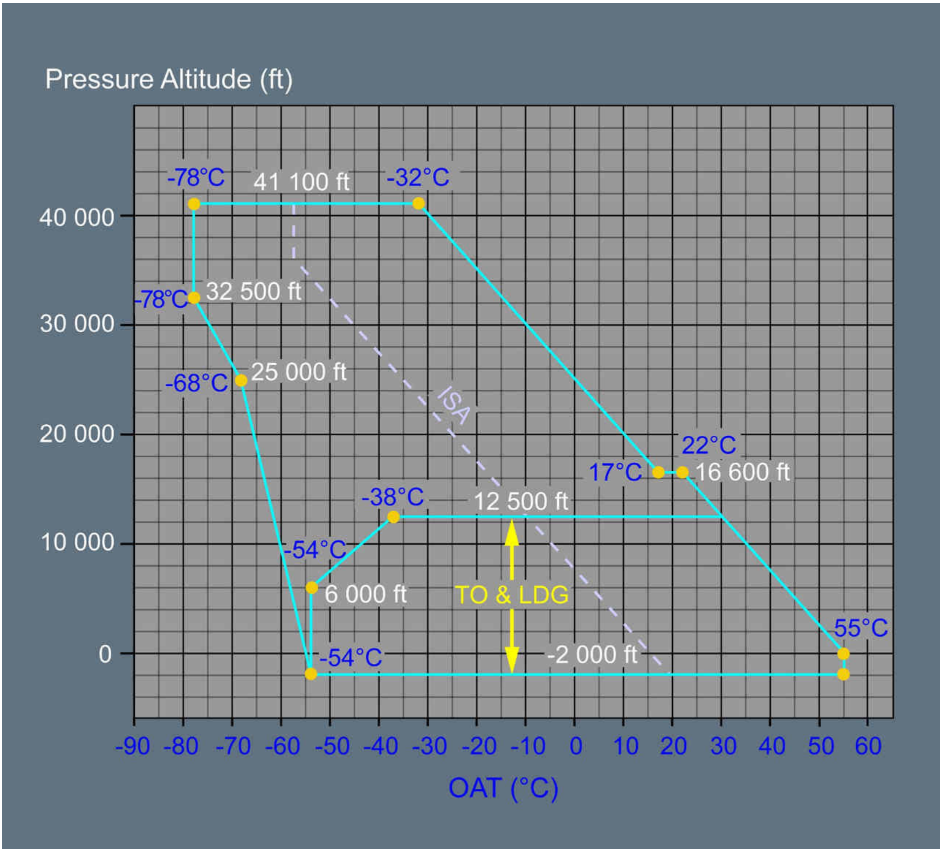
ENVIRONMENTAL ENVELOPE

Ident.: LIM-AG-OPS-ENV-00021654.0013001 / 19 JUL 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU



Ident.: LIM-AG-OPS-ENV-00021654.0001001 / 19 JUL 17
Applicable to: LV-GKO, LV-GKP



Ident.: LIM-AG-OPS-ENV-00020116.0001001 / 17 MAR 17
Applicable to: ALL

Minimum TAT..-53 °C

AIRPORT OPERATIONS AND WIND LIMITATIONS

Ident.: LIM-AG-OPS-ARPT_WIND-00020102.0001001 / 17 MAR 17
Applicable to: ALL

RUNWAY SLOPE

Runway slope (mean).. ±2 %

Ident.: LIM-AG-OPS-ARPT_WIND-00020103.0001001 / 17 MAR 17
Applicable to: ALL

RUNWAY ALTITUDE

Runway altitude.. 12 500 ft

Ident.: LIM-AG-OPS-ARPT_WIND-00020104.0001001 / 17 MAR 17
Applicable to: ALL

NOMINAL RUNWAY WIDTH

Nominal Runway Width.. 45 m

Ident.: LIM-AG-OPS-ARPT_WIND-00020105.0006001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

CROSSWIND TAKEOFF AND LANDING

Maximum certified crosswind for takeoff.. 32 kt (gust included)

Note:
- *The maximum certified crosswind value for takeoff is an Airplane Flight Manual (AFM) limitation. It is an engine limitation.*
- *Airbus recommends that operators should not intentionally operate in crosswinds that exceed this value.*

Maximum demonstrated crosswind for landing.. 45 kt (gust included)

Note:
- *The maximum demonstrated crosswind value is not an Airplane Flight Manual (AFM) limitation : It is the maximum crosswind condition experienced during the aircraft certification campaign.*
- *Airbus recommends that operators should not intentionally operate in crosswinds that exceed this value.*

Ident.: LIM-AG-OPS-ARPT_WIND-00020105.0004001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

CROSSWIND TAKEOFF AND LANDING

Maximum demonstrated crosswind (takeoff and landing).. 45 kt (gust included)

Note:
- *The maximum demonstrated crosswind value is not an Airplane Flight Manual (AFM) limitation : It is the maximum crosswind condition experienced during the aircraft certification campaign.*
- *Airbus recommends that operators should not intentionally operate in crosswinds that exceed this value.*

Ident.: LIM-AG-OPS-ARPT_WIND-00020179.0003001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

TAILWIND TAKEOFF

Maximum tailwind for takeoff.......... 15 kt

Ident.: LIM-AG-OPS-ARPT_WIND-00020179.0001001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

TAILWIND TAKEOFF

Maximum tailwind for takeoff.......... 10 kt

Ident.: LIM-AG-OPS-ARPT_WIND-00020660.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

TAILWIND LANDING

Maximum tailwind for landing.......... 10 kt

Ident.: LIM-AG-OPS-ARPT_WIND-00020660.0011001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

TAILWIND LANDING

Maximum tailwind for landing at or below 11 000 ft .... 15 kt
Maximum tailwind for landing above 11 000 ft .... 10 kt

Note: *Maximum tailwind for automatic landing and rollout. Refer to LIM-AFS-20 Maximum Wind Conditions for ILS CAT II or CAT III and for GLS (If Installed) CAT I.*

Ident.: LIM-AG-OPS-ARPT_WIND-00020184.0002001 / 22 MAR 17
Applicable to: LV-GKO, LV-GKP

FLAPS FULL NOTE

Note: *For landing with a tailwind greater than 10 kt, FLAPS FULL is recommended.*

Ident.: LIM-AG-OPS-ARPT_WIND-00020185.0001001 / 04 JUL 17
Applicable to: ALL

PASSENGER AND CARGO DOORS OPERATION

The following are the wind limitations for passenger and cargo doors operation:

- The maximum wind for passenger door operation is 40 kt (or 50 kt , if the aircraft nose is into the wind).
- The maximum wind for FWD and AFT cargo doors operation is 40 kt (or 50 kt , if the aircraft nose is into the wind, or if the FWD and AFT cargo doors are on the downwind side of the aircraft).
- The passenger, FWD and AFT cargo doors must be closed before the wind speed exceeds 60 kt.

Ident.: LIM-AG-OPS-ARPT_WIND-00020759.0009001 / 10 MAY 21
Applicable to: LV-KHT, LV-KHU

MAXIMUM RECOMMENDED CROSSWIND ON WET AND CONTAMINATED RUNWAYS

Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP(1)		RWYCC(2)	Level	
Damp **Wet** Up to 3 mm (1/8") of water **Slush** Up to 3 mm (1/8") **Dry snow** Up to 3 mm (1/8") **Wet snow** Up to 3 mm (1/8") **Frost**	**Good**	32 kt	**5**	**GOOD**	45 kt
Compacted snow OAT at or below -15 °C	**Good to Medium**	27 kt	**4**	**GOOD TO MEDIUM**	27 kt
Dry snow More than 3 mm (1/8"), up to 100 mm (4") **Wet snow** More than 3 mm (1/8"), up to 30 mm (6/5") **Compacted snow** OAT above -15 °C **Dry snow over compacted snow** **Wet snow over compacted snow** **Slippery wet**	**Medium**	20 kt	**3**	**MEDIUM**	20 kt

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Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP[1]		RWYCC[2]	Level	
Standing Water More than 3 mm (1/8"), up to 13 mm (1/2") **Slush** More than 3 mm (1/8"), up to 13 mm (1/2")	**Medium to Poor**	20 kt	**2**	**MEDIUM TO POOR**	20 kt
Ice (cold & dry)	**Poor**	15 kt	**1**	**POOR**	15 kt

(1) *AIREP: Special Air Report of Braking Action*

(2) *RWYCC: Runway Condition Code*

Note: *The maximum crosswind values given in the above table are recommended values based on computations.*

Ident.: LIM-AG-OPS-ARPT_WIND-00020759.0007001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

MAXIMUM RECOMMENDED CROSSWIND ON WET AND CONTAMINATED RUNWAYS

Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP[1]		RWYCC[2]	Level	
Damp **Wet** Up to 3 mm (1/8") of water **Slush** Up to 3 mm (1/8") **Dry snow** Up to 3 mm (1/8") **Wet snow** Up to 3 mm (1/8") **Frost**	**Good**	45 kt	**5**	**GOOD**	45 kt
Compacted snow OAT at or below -15 °C	**Good to Medium**	27 kt	**4**	**GOOD TO MEDIUM**	27 kt

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Runway Surface Conditions		Maximum Crosswind for Takeoff (Gust included)	Related Landing Performance		Maximum Crosswind for Landing (Gust included)
Runway State or / and Runway Contaminant	AIREP[(1)]		RWYCC[(2)]	Level	
Dry snow More than 3 mm (1/8"), up to 100 mm (4") **Wet snow** More than 3 mm (1/8"), up to 30 mm (6/5") **Compacted snow** OAT above -15 °C **Dry snow over compacted snow** **Wet snow over compacted snow** **Slippery wet**	**Medium**	20 kt	**3**	**MEDIUM**	20 kt
Standing Water More than 3 mm (1/8"), up to 13 mm (1/2") **Slush** More than 3 mm (1/8"), up to 13 mm (1/2")	**Medium to Poor**	20 kt	**2**	**MEDIUM TO POOR**	20 kt
Ice (cold & dry)	**Poor**	15 kt	**1**	**POOR**	15 kt

(1) *AIREP: Special Air Report of Braking Action*

(2) *RWYCC: Runway Condition Code*

Note: *The maximum crosswind values given in the above table are recommended values based on computations.*

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COCKPIT WINDOW OPEN MAXIMUM SPEED

Ident.: LIM-AG-SPD-00004878.0001001 / 17 MAR 17
Applicable to: ALL

Maximum speed...230 kt

Note: *It is not possible to open the cockpit windows, with the packs ON.*

MAXIMUM FLAPS/SLATS SPEEDS

Ident.: LIM-AG-SPD-00019939.0001001 / 17 MAR 17
Applicable to: ALL

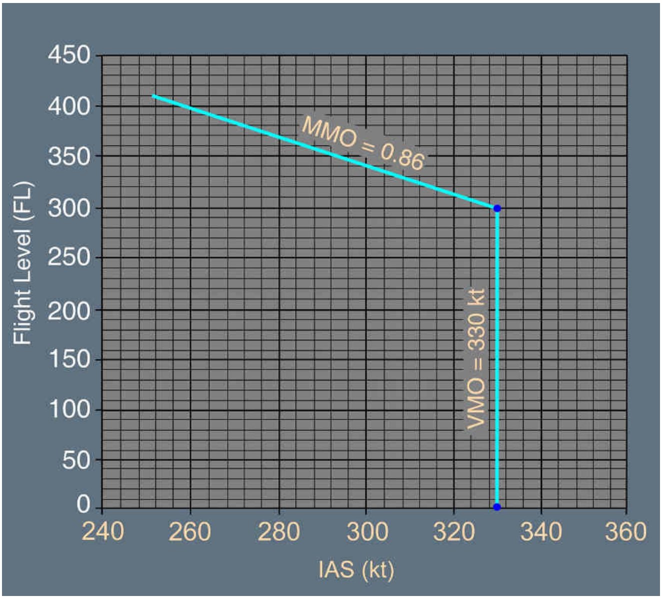
Flaps Lever Position	Configuration on Slat/Flap Display	Max Speed	Flight Phase
0		VMO / MMO	CRUISE
1	1	240	HOLDING
	1 + F	215	TAKEOFF
2	2(1)	205	APPROACH
	2	196	TAKEOFF/APPROACH
3	3	186	TAKEOFF/APPR/LDG
FULL	FULL	180	LANDING

(1) *This slats/flaps position corresponds to CONF 1*.*

MAXIMUM OPERATING SPEED VMO/MMO

Applicable to: ALL

Ident.: LIM-AG-SPD-10-00019937.0001001 / 17 MAR 17



The flight crew may not deliberately exceed the maximum operating speed limits VMO/MMO in any regime of flight.

MAXIMUM SPEEDS WITH THE LANDING GEAR EXTENDED

Ident.: LIM-AG-SPD-00019944.0001001 / 17 MAR 17
Applicable to: ALL

Maximum speed with landing gear extended (VLE)	250 kt/0.55
Maximum speed with the landing gear operating - extension and retraction (VLO)	250 kt/0.55
Maximum speed for landing gear gravity extension (VLE/VLO)	200 kt

MAXIMUM TIRE SPEED

Ident.: LIM-AG-SPD-00004876.0001001 / 17 MAR 17
Applicable to: ALL

Maximum ground speed	204 kt

MINIMUM CONTROL SPEEDS

Ident.: LIM-AG-SPD-00019938.0036001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

MINIMUM CONTROL SPEED FOR LANDING (VMCL)

VMCL (IAS)..118 kt

MINIMUM CONTROL SPEEDS IN THE AIR (VMCA) AND ON THE GROUND (VMCG)

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
0	105	110	110	111
2 000	102	108	108	108
4 000	100	105	106	106
6 000	96	102	102	103
8 000	93	99	99	100

When the Thrust Bump ◁ is used, consider the following VMCA/VMCG:

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
0	106	112	112	112
2 000	104	109	109	109
4 000	100	106	106	106
6 000	97	103	103	103
8 000	93	100	100	100

MINIMUM CONTROL SPEEDS

Ident.: LIM-AG-SPD-00019938.0034001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

MINIMUM CONTROL SPEED FOR LANDING (VMCL)

VMCL (IAS)..118 kt

MINIMUM CONTROL SPEEDS IN THE AIR (VMCA) AND ON THE GROUND (VMCG)

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
0	106	112	112	112
2 000	104	109	109	109
4 000	100	106	106	106
6 000	97	103	103	103
8 000	93	100	100	100

MINIMUM CONTROL SPEEDS

Ident.: LIM-AG-SPD-00019938.0032001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

MINIMUM CONTROL SPEED FOR LANDING (VMCL)

VMCL (IAS)..118 kt

MINIMUM CONTROL SPEEDS IN THE AIR (VMCA) AND ON THE GROUND (VMCG)

Altitude (ft)	VMCA (kt IAS)	VMCG (kt IAS)		
		CONF 1 + F	CONF 2	CONF 3
0	106	110	110	110
2 000	103	108	108	108
4 000	101	106	107	107
6 000	98	103	104	104
8 000	95	100	100	101

WIPERS MAXIMUM OPERATING SPEED

Ident.: LIM-AG-SPD-00004877.0001001 / 17 MAR 17
Applicable to: ALL

Maximum speed..230 kt

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001822.0014001 / 21 MAR 11
Applicable to: LV-KAN, LV-KAO

Maximum taxi weight	233 900 kg (515 661 lb)
Maximum takeoff weight (brake release)	233 000 kg (513 676 lb)
Maximum landing weight	182 000 kg (401 241 lb)
Maximum zero fuel weight	170 000 kg (374 785 lb)
Minimum weight	116 000 kg (255 737 lb)

In exceptional conditions (inflight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided that the pilot follows the overweight landing procedure.

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001822.0393001 / 18 MAR 11
Applicable to: LV-FVH, LV-FVI, LV-GKO, LV-GKP

Maximum taxi weight	238 900 kg (526 684 lb)
Maximum takeoff weight (brake release)	238 000 kg (524 700 lb)
Maximum landing weight	182 000 kg (401 241 lb)
Maximum zero fuel weight	168 000 kg (370 376 lb)
Minimum weight	116 000 kg (255 737 lb)

In exceptional conditions (inflight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided that the pilot follows the overweight landing procedure.

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001822.0469001 / 09 JUN 15
Applicable to: LV-GHQ, LV-GIF

Maximum taxi weight	242 900 kg (535 502 lb)
Maximum takeoff weight (brake release)	242 000 kg (533 518 lb)
Maximum landing weight	182 000 kg (401 241 lb)
Maximum zero fuel weight	166 000 kg (365 967 lb)
Minimum weight	116 000 kg (255 737 lb)

In exceptional conditions (inflight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided that the pilot follows the overweight landing procedure.

WEIGHT LIMITATIONS

Ident.: LIM-AG-WGHT-00001822.0409001 / 23 SEP 11
Applicable to: LV-KHT, LV-KHU

Maximum taxi weight 1	238 900 kg (526 684 lb)
Maximum takeoff weight 1 (brake release)	238 000 kg (524 700 lb)
Maximum taxi weight 2	236 900 kg (522 275 lb)
Maximum takeoff weight 2 (brake release)	236 000 kg (520 291 lb)
Maximum landing weight	182 000 kg (401 241 lb)
Maximum zero fuel weight 2	170 000 kg (374 785 lb)
Maximum zero fuel weight 1	168 000 kg (370 376 lb)
Minimum weight	116 000 kg (255 737 lb)

Multiple MTOW and MZFW are certified. A placard fitted on the aircraft must reflect the current MTOW and MZFW.

In exceptional conditions (inflight turn back or diversion), an immediate landing at weight above maximum landing weight is permitted, provided that the pilot follows the overweight landing procedure.

LIMITATIONS

AIR BLEED/COND/PRESS/VENT

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LIMITATIONS

AIR BLEED/COND/PRESS/VENT

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APU Bleed Use with HP Air Start Unit.... B
Cabin Pressure....C
Packs Use with LP Air Conditioning Unit....D

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GENERAL

Ident.: LIM-AIR-00020648.0001001 / 17 MAR 17
Applicable to: ALL

With passengers on board, it is not recommended to exceed 20 min without air conditioning supply. The lack of fresh air supply will significantly reduce the cabin's air quality.

APU BLEED USE WITH HP AIR START UNIT

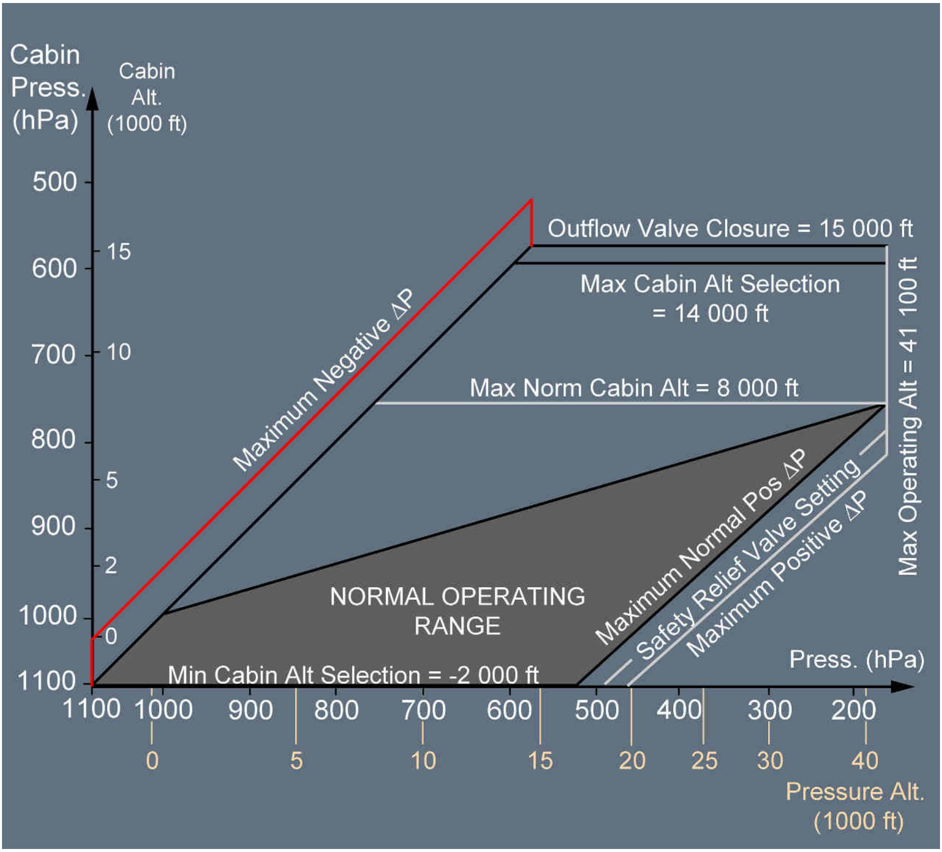
Ident.: LIM-AIR-00019987.0001001 / 17 MAR 17
Applicable to: ALL

The flight crew must not use bleed air from the APU BLEED and from the HP Air Start Unit at the same time, to prevent any adverse effect on the Bleed Air System.

CABIN PRESSURE

Ident.: LIM-AIR-00019990.0007001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

Maximum positive differential pressure	9.25 PSI
Maximum negative differential pressure	-0.73 PSI
Safety relief valve setting	8.85 PSI



Note: 1. *Maximum differential pressure (Δp) and safety valve setting tolerance = ± 7 hPa (0.1 PSI).*

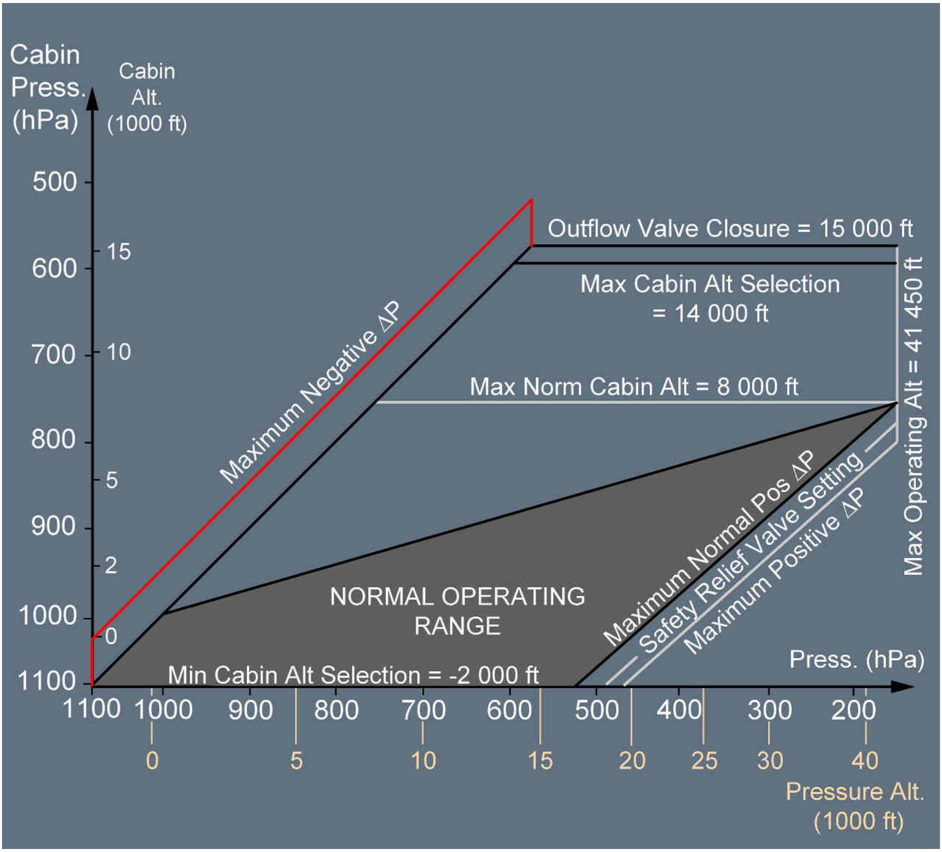
2. *Depending on CPC standard, for flights longer than 2.5 h, the maximum normal cabin altitude can be limited to 7 350 ft.*

CABIN PRESSURE

Ident.: LIM-AIR-00019990.0014001 / 17 MAR 17

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

Maximum positive differential pressure	9.25 PSI
Maximum negative differential pressure	-0.73 PSI
Safety relief valve setting	8.85 PSI



Note: 1. *Maximum differential pressure (Δp) and safety valve setting tolerance = ± 7 hPa (0.1 PSI).*
2. *Depending on CPC standard, for flights longer than 2.5 h, the maximum normal cabin altitude can be limited to 7 460 ft.*

PACKS USE WITH LP AIR CONDITIONING UNIT

Ident.: LIM-AIR-00019986.0001001 / 17 MAR 17
Applicable to: ALL

The flight crew must not use conditioned air from the packs and from the LP Air Conditioning Unit at the same time, to prevent any adverse effect on the Air Conditioning system.

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LIMITATIONS

AUTO FLIGHT SYSTEM

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LIM-AFS-10 General

Autopilot Function........A
Flight Management Function........B
Use of NAV Mode........C
Use of FLS ◁ ....D
Navigation Database Validation........E

LIM-AFS-20 Automatic Approach, Landing and Rollout

ILS Category II........A
Special Authorization CAT II (SA CAT II)........B
Other than Standard CAT II (OTS CAT II)........C
ILS Category III Fail Passive (Single)........D
ILS Category III Fail Operational (Dual)........E
Engine-Out........F
Maximum Wind Conditions for ILS CAT II or CAT III and for GLS ◁ CAT I........G
Automatic Landing........H

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AUTOPILOT FUNCTION

Applicable to: ALL

Ident.: LIM-AFS-10-10-00020138.0001001 / 17 MAR 17

The autopilot can be used with the following minimum values:

Ident.: LIM-AFS-10-10-00020140.0001001 / 23 JUL 18

At takeoff	100 ft AGL and at least 5 s after liftoff

Ident.: LIM-AFS-10-10-00020141.0001001 / 23 JUL 18

In approach with F-G/S mode	200 ft AGL
In approach with FINAL APP, V/S or FPA mode	250 ft AGL

Ident.: LIM-AFS-10-10-00020142.0001001 / 17 MAR 17

In circling approach	500 ft AGL

Ident.: LIM-AFS-10-10-00020143.0001001 / 15 NOV 21

ILS approach when CAT1 is displayed on the FMA	160 ft AGL
GLS approach when AUTOLAND is not displayed on the FMA	160 ft AGL
LPV approach (with SLS) when CAT1 is displayed on the FMA	160 ft AGL
ILS approach when CAT2 or CAT3 (single or dual) is displayed on the FMA	0 ft AGL if autoland

Ident.: LIM-AFS-10-10-00020144.0001001 / 17 MAR 17

After a manual go-around	100 ft AGL

Ident.: LIM-AFS-10-10-00020145.0001001 / 06 JUL 17

In all other phases	500 ft AGL

The AP or FD in OP DES or DES mode can be used in approach. However, its use is only permitted if the FCU selected altitude is set to, or above, the higher of the two: MDA/MDH or 500 ft AGL.

FLIGHT MANAGEMENT FUNCTION

Ident.: LIM-AFS-10-20-00020162.0001001 / 15 NOV 21

Applicable to: ALL

FMGES lateral and vertical navigation is certified for:

- After takeoff, en route, and terminal area operations
- Navigation within RNAV/RNP airspace
- Instrument approach procedures (except ILS, LOC, LOC B/C, IGS, LDA, SDF, GLS and FLS final approaches)
- Missed approach procedures.

The FLS function is certified for:
- RNAV, RNAV (GNSS) approach with LNAV/VNAV or LNAV minima, GPS, VOR, VOR/DME, NDB, NDB/DME instrument approach procedures, using FMS navigation for lateral and vertical navigation
- LOC, ILS (G/S out), or LOC B/C instrument approaches, using FMS navigation for vertical navigation, associated with LOC or LOC B/C for lateral navigation.

The SLS function is certified for RNAV (GNSS) approach with LPV/LP minima,
Approval of the FMGES is based on the assumption that the navigation database is validated for intended use.
Obstacle clearance and adherence to airspace constraints remains a flight crew responsibility.
Fuel, time predictions/performance information is provided for advisory purpose only.

Ident.: LIM-AFS-10-20-00020163.0002001 / 17 MAR 17
Applicable to: ALL

NAVIGATION PERFORMANCE

The navigation accuracy depends on:
- IRS drift, or
- One of the following:
  - Radio navaid availability, or
  - Elapsed time since last computation of radio navaid position.

RNP accuracy with GPS PRIMARY is:

	With AP ON (1)	With AP OFF and FD ON (1)	With AP OFF and FD OFF
En route	1 NM	1 NM	1.1 NM
In terminal area	0.5 NM	0.51 NM	0.51 NM
In approach	0.3 NM	0.3 NM	With F-LOC deviation: 0.3 NM Without F-LOC deviation: not authorized

(1)
- *In NAV mode (all phases), or*
- *In F-LOC (approach phase).*

Ident.: LIM-AFS-10-20-00020464.0001001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

- **For RNP AR:**
  The aircraft is capable of conducting RNP AR operations when operated in accordance with the recommendations provided in the Airbus Airworthiness Compliance Document (ACD).

RNP AR capability limited to 0.3 NM has been demonstrated with AP ON for the following modes:

- Departure in NAV mode
- Initial and Intermediate approach in NAV mode, or APP NAV mode when convenient
- Final approach in FINAL APP mode
- Missed approach in NAV mode.

Note: *For navigation performance and recommendations regarding RNP AR operations with AP OFF / FD ON, refer to ACD.*

Ident.: LIM-AFS-10-20-00020464.0002001 / 17 MAR 17
Applicable to: LV-KAN, LV-KAO

- **For RNP AR:**

The aircraft is capable of conducting RNP AR operations when operated in accordance with the recommendations provided in the Airbus Airworthiness Compliance Document (ACD).
The achieved RNP AR level could be below 0.3 NM and depends on the type of RNP AR application. Refer to ACD for maximum achievable RNP values.

RNP AR capability has been demonstrated with AP ON for the following modes:

- Departure in NAV mode
- Initial and Intermediate approach in NAV or APP NAV modes
- Final approach in FINAL APP mode
- Missed approach in NAV mode.

Note: *For navigation performance and recommendations regarding RNP AR operations with AP OFF / FD ON, refer to ACD.*

Ident.: LIM-AFS-10-20-00020465.0001001 / 04 JUN 19
Applicable to: ALL

DEGRADED SITUATION

If GPS PRIMARY LOST ◁ is displayed on the ND, the navigation accuracy remains sufficient for RNP operations provided that the RNP value is checked or entered on the MCDU and HIGH ACCURACY is displayed.

USE OF NAV MODE

Applicable to: ALL

Ident.: LIM-AFS-10-30-00020164.0001001 / 17 MAR 17

AFTER TAKEOFF

NAV mode may be used after takeoff provided that:

- GPS PRIMARY ◁ is available, or
- The flight crew checked the FMGES takeoff updating.

Ident.: LIM-AFS-10-30-00020165.0001001 / 17 MAR 17

IN TERMINAL AREA

NAV mode may be used in terminal area provided that:

- GPS PRIMARY ◁ is available, or
- the appropriate RNP is checked or entered on the MCDU, and HIGH accuracy is displayed, or
- FMS navigation is crosschecked with navaid raw data.

Ident.: LIM-AFS-10-30-00020166.0001001 / 17 MAR 17

APPROACH BASED ON RADIO NAVAIDS

A navaids approach may be performed in NAV, APP NAV or FINAL APP, with AP or FD engaged, provided that:

- If GPS PRIMARY ◁ is available, the reference navaids may be unserviceable, or the airborne radio equipment may be inoperative, or not installed, provided that an operational approval is obtained
- If GPS PRIMARY is not available, the reference navaids and the corresponding airborne radio equipment must be serviceable, tuned and monitored during the approach.

Note: *FLS ◁ is the recommended managed lateral and vertical guidance mode for radio navaids approach.*

Ident.: LIM-AFS-10-30-00020167.0001001 / 17 MAR 17

RNAV APPROACH

An RNAV(RNP) approach may be performed, GPS PRIMARY is not available, only if the radio navaid coverage supports the RNP value and HIGH accuracy is displayed on the MCDU with the specified RNP, and an operational approval is obtained.
An RNAV(GNSS) approach may be performed provided that GPS PRIMARY ◁ is available.
Refer to PRO-NOR-SOP-18-A Cross-Reference Table.

Note: *FLS ◁ is the recommended managed lateral and vertical guidance mode for RNAV approach.*

USE OF FLS ⩤

Ident.: LIM-AFS-10-00020168.0001001 / 28 MAY 20
Applicable to: ALL

APPROACH BASED ON RADIO NAVAIDS

A navaids approach (e.g. VOR/DME) may be flown with the FLS provided that:
- F-APP capability is displayed on FMA.
  In this case, the reference navaids may be unserviceable, or the airborne radio equipment may be inoperative, or not installed, provided an operational approval is obtained.
- F-APP + RAW capability is displayed on FMA.
  In this case, the reference navaids and the corresponding airborne radio equipment must be serviceable, tuned and monitored during the approach.

An ILS (G/S out), ILS-B/C (G/S out), LOC, LOC-B/C approach may be flown with the lateral LOC (LOC B/C) mode and with the F-G/S mode of FLS function provided that:
- F-APP capability is displayed on FMA.
  In this case, the reference navaids used for the vertical path validation must be tuned and checked at final descent point.
- F-APP + RAW capability is displayed on FMA.
  In this case, the reference navaids used for the vertical path validation must be tuned and checked at final descent point and monitored during the approach.

RNAV(GNSS) APPROACH

An RNAV(GNSS) approach with LNAV minimum may be flown with the FLS provided that the F-APP capability is displayed on FMA.
An RNAV(GNSS) approach with LNAV/VNAV minimum must be flown with the FLS provided that the F-APP capability is displayed on FMA.

Note: *The RNAV(GNSS) approach limitations and procedures must be used to perform an RNAV approach for which the GNSS is not required.*

NAVIGATION DATABASE VALIDATION

Ident.: LIM-AFS-10-40-00021525.0006001 / 05 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

RNAV(GNSS) APPROACHES AND APPROACHES BASED ON VOR/NDB

To fly an approach in lateral managed mode or lateral and vertical managed mode, the approach stored in the Navigation Database must be either:
- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, or

- Validated and approved by the Operator.

Note: *RNAV(GNSS) approaches lateral trajectories are geometrically based on waypoints coordinates. Thus, validating waypoints coordinate ensure no coding error on the approach and correct lateral trajectory. Observed lateral track degree of difference between MCDU F-PLN page display and charts may come from inconsistency between FMS MagVar and charted MagVar, which has no effect on lateral trajectory.*

Ident.: LIM-AFS-10-40-00021525.0003001 / 05 MAY 22
Applicable to: LV-GKO, LV-GKP

APPROACHES BASED ON VOR/NDB

To fly an approach in lateral managed mode or lateral and vertical managed mode, the approach stored in the Navigation Database must be either:
- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, or
- Validated and approved by the Operator.

RNAV(GNSS) APPROACHES

To fly an RNAV(GNSS) approach **in lateral managed mode only (NAV/FPA)**, the approach stored in the Navigation Database must be either:
- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, or
- Validated and approved by the Operator.

To fly an RNAV(GNSS) approach **in lateral and vertical managed mode (FINAL APP)**, the approach stored in the Navigation Database must be both:
- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, and
- Validated and approved by the Operator.

Note: *RNAV(GNSS) approaches lateral trajectories are geometrically based on waypoints coordinates. Thus, validating waypoints coordinate ensure no coding error on the approach and correct lateral trajectory. Observed lateral track degree of difference between MCDU F-PLN page display and charts may come from inconsistency between FMS MagVar and charted MagVar, which has no effect on lateral trajectory.*

Ident.: LIM-AFS-10-40-00021525.0004001 / 05 MAY 22
Applicable to: LV-KAN, LV-KAO, LV-KHT, LV-KHU

RNAV(GNSS) APPROACHES AND APPROACHES BASED ON VOR/NDB

To fly an approach in lateral managed mode or lateral and vertical managed mode, the approach stored in the Navigation Database must be either:

- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, or
- Validated and approved by the Operator.

Note: *RNAV(GNSS) approaches lateral trajectories are geometrically based on waypoints coordinates. Thus, validating waypoints coordinate ensure no coding error on the approach and correct lateral trajectory. Observed lateral track degree of difference between MCDU F-PLN page display and charts may come from inconsistency between FMS MagVar and charted MagVar, which has no effect on lateral trajectory.*

RNAV(RNP) APPROACHES

To fly an RNAV(RNP) procedure (departure, approach, missed approach), the procedure stored in the Navigation Database must be both:

- Produced by an approved supplier compliant with ED76/DO200A or DAT Type 2 requirements, and
- Validated and approved by the Operator.

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ILS CATEGORY II

Ident.: LIM-AFS-20-00020171.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..100 ft
At least one autopilot must be engaged in APPR mode, and CAT 2 or CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
For manual landing, AP should be disconnected no later than 80 ft AGL.

SPECIAL AUTHORIZATION CAT II (SA CAT II)

Ident.: LIM-AFS-20-00020172.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..100 ft
At least one autopilot must be engaged in APPR mode, and CAT 2 or CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
With HUD , the flight crew must use the HUD to monitor the approach and perform an automatic landing or a manual landing. If the flight crew performs an automatic approach without automatic landing, the autopilot must be disengaged no later than at 80 ft AGL.
Without HUD, the flight crew must perform an automatic landing.

OTHER THAN STANDARD CAT II (OTS CAT II)

Ident.: LIM-AFS-20-00020173.0001001 / 18 SEP 18
Applicable to: ALL

Minimum decision height..100 ft
At least one autopilot must be engaged in APPR mode, and CAT 2 or CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
With HUD , the flight crew must use the HUD to monitor the approach and perform an automatic landing or a manual landing. If the flight crew performs an automatic approach without automatic landing, the autopilot must be disengaged no later than at 80 ft AGL.
Without HUD, the flight crew must perform an automatic landing.

ILS CATEGORY III FAIL PASSIVE (SINGLE)

Ident.: LIM-AFS-20-00020174.0001001 / 18 SEP 18
Applicable to: ALL

A/THR must be used in selected or managed speed.
One autopilot must be engaged in APPR mode, and CAT 3 SINGLE or CAT 3 DUAL must be displayed on the FMA.
Minimum decision height..50 ft

ILS CATEGORY III FAIL OPERATIONAL (DUAL)

Ident.: LIM-AFS-20-00020175.0001001 / 03 NOV 23
Applicable to: ALL

Alert height.. 200 ft
A/THR must be used in selected or managed speed.
Both autopilots must be engaged in APPR mode, and CAT 3 DUAL must be displayed on the FMA.

- **CAT III without DH:**
  Minimum Runway Visual Range...75 m

ENGINE-OUT

Ident.: LIM-AFS-20-00020176.0001001 / 17 MAR 17
Applicable to: ALL

CAT II and CAT III autoland are only approved in Configuration 3, and if engine-out procedures are completed before reaching 1 000 ft in approach.

MAXIMUM WIND CONDITIONS FOR ILS CAT II OR CAT III AND FOR GLS ◁ CAT I

Ident.: LIM-AFS-20-00020178.0001001 / 17 MAR 17
Applicable to: ALL

Headwind: 35 kt
Tailwind : 10 kt
Crosswind 20 kt

Note: *Wind limitation is based on the surface wind reported by the tower. If the wind displayed on the ND exceeds the above-noted autoland limitations, but the tower reports surface wind within the limitations, then the autopilot can remain engaged. If the tower reports surface wind beyond the limitations, only a CAT I automatic approach without autoland can be performed.*

AUTOMATIC LANDING

Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Ident.: LIM-AFS-20-10-00020146.0001001 / 17 MAR 17

ILS CAT II and CAT III autoland and GLS CAT I autoland are approved in CONF 3 and CONF FULL.

Ident.: LIM-AFS-20-10-00020147.0001001 / 17 MAR 17

Automatic landing is demonstrated:

- With CAT II and CAT III ILS beam and CAT I GLS beam.

Ident.: LIM-AFS-20-10-00020148.0001001 / 17 MAR 17

- With a glide slope angle between -2.5 ° and -3.25 °
- For airfield elevation below 9 200 ft

Ident.: LIM-AFS-20-10-00020139.0002001 / 17 MAR 17

- For weights above 123 000 kg (271 166 lb)

Ident.: LIM-AFS-20-10-00020153.0005001 / 25 JAN 18

- With aircraft weight below the maximum landing weight

Note: *Depending on the situation (e.g. emergency or other) and provided that the runway is approved for automatic landing, the flight crew can decide to perform an autoland up to 229 t (504 858 lb).*

Ident.: LIM-AFS-20-10-00020151.0001001 / 28 MAY 20

Automatic rollout performance is approved on dry and wet runways, but performance on contaminated runways was not demonstrated.

Ident.: LIM-AFS-20-10-00020152.0001001 / 06 JUL 17

Automatic landing system performance has been demonstrated on CAT II and CAT III ILS beams. However, automatic landing in CAT I, or better weather conditions is possible on CAT I ground installation, or on CAT II/III ground installations when ILS-sensitive areas are not protected, if the following precautions are taken:

- The airline has checked that the ILS beam quality, and the effect of the terrain profile before the runway, have no adverse effect on AP guidance. In particular, the effect of terrain discontinuities within 300 m (974 ft) before the runway threshold must be evaluated.
- The flight crew is aware that LOC or G/S beam fluctuations, independent of the aircraft system, may occur. The PF is prepared to immediately disconnect the AP and to take the appropriate action, should unsatisfactory guidance occur.
- At least CAT 2 capability is displayed on the FMA, and CAT II/III procedures are used.
- Visual references are obtained, at a DH appropriate for the CAT I approach being flown, or a go-around is performed.

AUTOMATIC LANDING

Applicable to: LV-KHT, LV-KHU

Ident.: LIM-AFS-20-10-00020146.0001001 / 17 MAR 17

ILS CAT II and CAT III autoland and GLS ◁ CAT I autoland are approved in CONF 3 and CONF FULL.

Ident.: LIM-AFS-20-10-00020147.0001001 / 17 MAR 17

Automatic landing is demonstrated:

- With CAT II and CAT III ILS beam and CAT I GLS ◁ beam.

Ident.: LIM-AFS-20-10-00020148.0001001 / 17 MAR 17

- With a glide slope angle between -2.5 ° and -3.25 °
- For airfield elevation below 9 200 ft

Ident.: LIM-AFS-20-10-00020139.0001001 / 17 MAR 17

- For weights above 116 000 kg (255 737 lb)

Ident.: LIM-AFS-20-10-00020153.0005001 / 25 JAN 18

- With aircraft weight below the maximum landing weight

Note: *Depending on the situation (e.g. emergency or other) and provided that the runway is approved for automatic landing, the flight crew can decide to perform an autoland up to 229 t (504 858 lb).*

Ident.: LIM-AFS-20-10-00020151.0001001 / 28 MAY 20

Automatic rollout performance is approved on dry and wet runways, but performance on contaminated runways was not demonstrated.

Ident.: LIM-AFS-20-10-00020152.0001001 / 06 JUL 17

Automatic landing system performance has been demonstrated on CAT II and CAT III ILS beams. However, automatic landing in CAT I, or better weather conditions is possible on CAT I ground installation, or on CAT II/III ground installations when ILS-sensitive areas are not protected, if the following precautions are taken:

- The airline has checked that the ILS beam quality, and the effect of the terrain profile before the runway, have no adverse effect on AP guidance. In particular, the effect of terrain discontinuities within 300 m (974 ft) before the runway threshold must be evaluated.
- The flight crew is aware that LOC or G/S beam fluctuations, independent of the aircraft system, may occur. The PF is prepared to immediately disconnect the AP and to take the appropriate action, should unsatisfactory guidance occur.
- At least CAT 2 capability is displayed on the FMA, and CAT II/III procedures are used.
- Visual references are obtained, at a DH appropriate for the CAT I approach being flown, or a go-around is performed.

LIMITATIONS

AUXILIARY POWER UNIT

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LIMITATIONS

AUXILIARY POWER UNIT

PRELIMINARY PAGES - TABLE OF CONTENTS

General........A
APU Start/Shutdown during Refueling/Defueling........B
Operational Envelope........C

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GENERAL

Applicable to: ALL

Ident.: LIM-APU-10-00020218.0001001 / 17 MAR 17

APU START

After three consecutive APU start attempts, the flight crew must wait 60 min before a new start attempt.

Ident.: LIM-APU-10-00020219.0001001 / 17 MAR 17

ROTOR SPEED

Maximum N speed.. 107 %

Ident.: LIM-APU-10-00020220.0001001 / 17 MAR 17

EGT

Maximum EGT for APU start.. 1 250 °C
Maximum EGT for APU running..650 °C

APU START/SHUTDOWN DURING REFUELING/DEFUELING

Ident.: LIM-APU-00020221.0001001 / 17 MAR 17
Applicable to: ALL

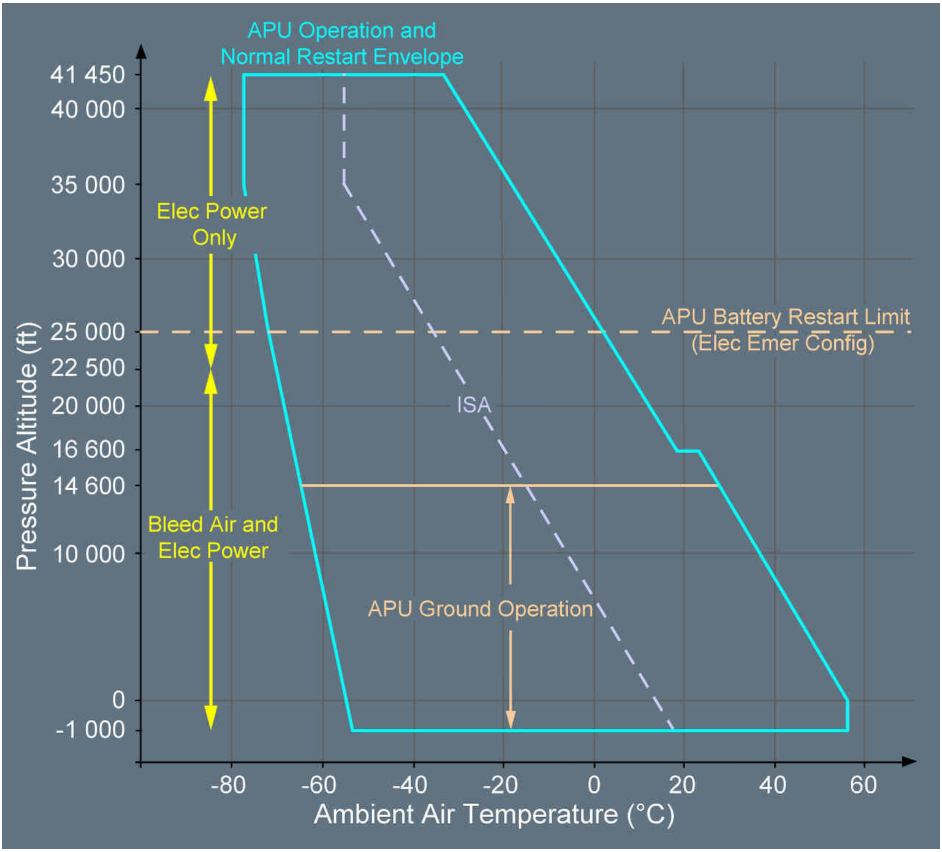
During refuel/defuel procedures, APU starts or shutdown are permitted with the following restrictions:

- If the APU failed to start or following an automatic APU shutdown, do not start the APU
- If a fuel spill occurs, perform a normal APU shutdown.

OPERATIONAL ENVELOPE

Applicable to: ALL

Ident.: LIM-APU-20-00020222.0006001 / 17 MAR 17



Ident.: LIM-APU-20-00020223.0001001 / 17 MAR 17

Note: *When JET B or JP4 is used, APU operation is limited to 25 000 ft.*

Ident.: LIM-APU-20-00021592.0001001 / 04 JUL 17

APU BLEED

Max altitude to assist engine start.. 20 000 ft

Max altitude for air conditioning and pressurization (single pack operation)	22 500 ft
Max altitude for air conditioning and pressurization (dual pack operation)	17 500 ft

Use of APU bleed air for wing anti-ice is not permitted.

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LIMITATIONS

CABIN SYSTEMS

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PRELIMINARY PAGES - TABLE OF CONTENTS

Power Supply for Portable Electronic Device (PED)........ A

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POWER SUPPLY FOR PORTABLE ELECTRONIC DEVICE (PED)

Ident.: LIM-CAB-00020157.0001001 / 22 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO, LV-KHT, LV-KHU

The In-Seat Power Supply System (ISPSS) for the Portable Electronic Device (PED) carried by the passengers must be turned off during takeoff and landing.

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LIMITATIONS

COMMUNICATIONS

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Onboard Mobile Telephony System (OMTS)........A
VHF3 Tunning in Voice Mode from the MCDU........B

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ONBOARD MOBILE TELEPHONY SYSTEM ◁ (OMTS)

Ident.: LIM-COM-00020238.0001001 / 17 MAR 17
Applicable to: ALL

The use of mobile phones is prohibited in the toilets and the cockpit.

VHF3 TUNNING IN VOICE MODE FROM THE MCDU

Ident.: LIM-COM-00001842.0001001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP

Do not use the MCDU’s VHF3 VOICE DIRECTORY and COMPANY CALL pages to tune VHF3 in Voice mode.
Only use RMP to tune VHF3 in Voice mode.

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LIMITATIONS

ENGINES

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Thrust Setting/EGT Limits.. A
Shaft Speeds.. B
Oil.. C
Starter.. D
Reverse Thrust.. E
Reduced Thrust Takeoff.. F
Crosswind Operation on Ground.. G
Soft Go-Around .... H

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THRUST SETTING/EGT LIMITS

Ident.: LIM-ENG-00020225.0002001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Operating Conditions		Time Limit	EGT Limit
Takeoff(1) and Go-around	All engines operative	5 min	975 °C
	One engine inoperative	10 min	
Maximum Continuous Thrust (MCT)		Not limited	940 °C
Starting	On ground		750 °C
	In flight		975 °C

(1) *Includes TOGA, FLEX, and DERATE ◁ thrust modes.*

THRUST SETTING/EGT LIMITS

Ident.: LIM-ENG-00020225.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

Operating Conditions		Time Limit	EGT Limit
Takeoff(1) and Go-around	All engines operative	20 s	920 °C
		5 min	900 °C
	One engine inoperative	10 min	
Maximum Continuous Thrust (MCT)		Not limited	850 °C
Starting	On ground		700 °C
	In flight		850 °C

(1) *Includes TOGA, FLEX, and DERATE ◁ thrust modes.*

SHAFT SPEEDS

Ident.: LIM-ENG-00020227.0004001 / 17 NOV 20
Applicable to: LV-KHT, LV-KHU

Maximum N1 .... 99 %

Note: *The N1 limit depends on the ambient conditions and on the configuration of the engine air bleed.*
These parameters may limit N1 to a value that is less than the above-mentioned N1 value.

Maximum N2 .... 103.3 %
Maximum N3 .... 100 %

SHAFT SPEEDS

Ident.: LIM-ENG-00020227.0002001 / 17 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Maximum N1... 115.5 %

Note: *The N1 limit depends on the ambient conditions and on the configuration of the engine air bleed.*
These parameters may limit N1 to a value that is less than the above-mentioned N1 value.

Maximum N2... 113 %

OIL

Ident.: LIM-ENG-00020226.0004001 / 03 NOV 21
Applicable to: LV-KHT, LV-KHU

OIL TEMPERATURE

Maximum continuous temperature... 190 °C
Minimum temperature before takeoff... 50 °C

OIL QUANTITY

The minimum oil quantity is the highest value of:
- 15 qt, or
- 6 qt + estimated consumption.

  Average estimated consumption = 0.7 qt/h.

OIL PRESSURE

Minimum oil pressure...25 PSI

OIL

Ident.: LIM-ENG-00020226.0002001 / 10 MAY 21
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

OIL TEMPERATURE

Maximum continuous temperature... 160 °C
Maximum transient temperature (15 min)... 175 °C
Minimum starting temperature..-40 °C

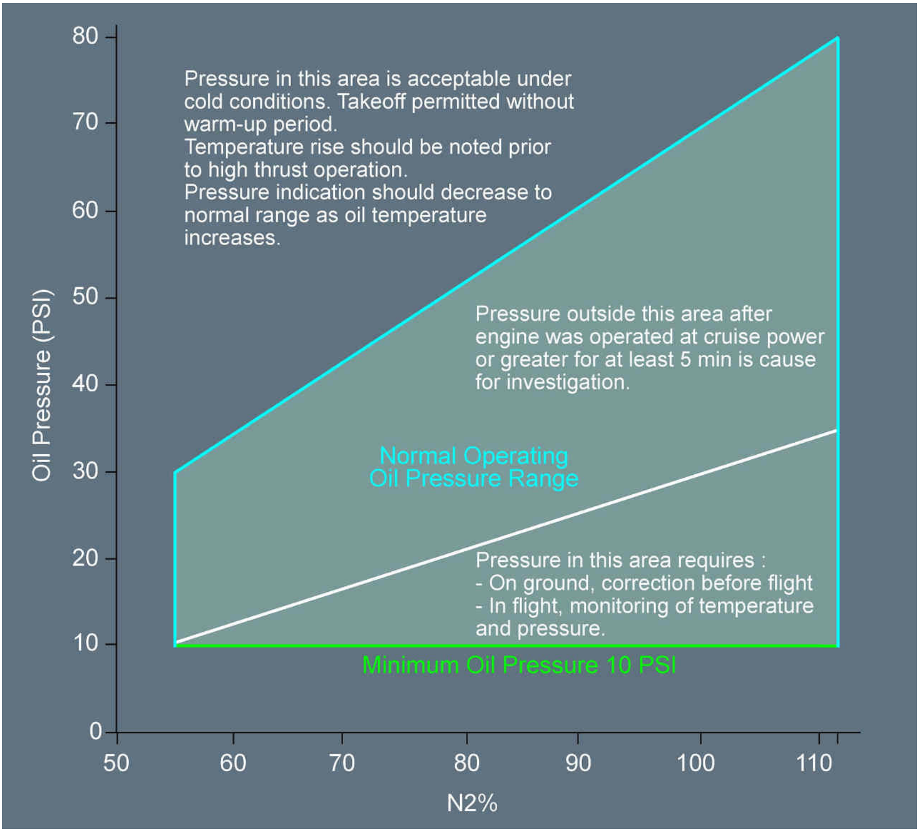
OIL QUANTITY

Minimum oil quantity.. 12 qt + estimated consumption

- *Average estimated consumption = 0.56 qt/h,*
- *Engine operation with engine oil consumption above 0.56 qt/h and up to 0.87 qt/h is allowed, provided that the engine oil consumption enables fulfillment of the mission.*

OIL PRESSURE

MIN/MAX Oil Pressure (ECAM Indication)



STARTER

Ident.: LIM-ENG-00001866.0003001 / 04 JUN 19
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

- A standard automatic start that includes up to three start attempts, is considered one cycle
- For ground starts (automatic or manual), a 30 s pause per minute of operation is required between successive cycles
- A 10 min cooling period is required, subsequent to two failed cycles, before each subsequent cycle
- The starter must not be run when N2 is above 30 %

STARTER

Ident.: LIM-ENG-00001866.0004001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

- Starter maximum continuous operation is 5 min .
- Two 3 min duty cycles and a consecutive 1 min cycle is permitted with run down to zero N3 between each cycle.
- After one continuous operation, or the three cycles wait 30 min to allow the starter to cool.
- No running engagement of the starter when the N3 is above 10 % on ground, or 30 % in flight.

REVERSE THRUST

Ident.: LIM-ENG-00020229.0001001 / 17 MAR 17
Applicable to: ALL

Selection of the reverse thrust is prohibited in flight.
Backing the aircraft with reverse thrust is not permitted.
Maximum reverse should not be used below 70 kt. Idle reverse is permitted down to aircraft stop.

REDUCED THRUST TAKEOFF

Ident.: LIM-ENG-10-00020230.0013001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

FLEX TAKEOFF

Takeoff at reduced thrust, so-called as FLEX takeoff, is permitted only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).
Takeoff at reduced thrust is permitted with any inoperative item affecting the performance only if the associated performance shortfall has been applied to meet the above requirements.
FLEX takeoff is not permitted on contaminated runways.

TFLEX cannot be:
- Higher than TMAXFLEX, equal to ISA + 60 °C.
- Lower than the flat rating temperature (TREF).
- Lower than the actual OAT.

Ident.: LIM-ENG-10-00020230.0002001 / 17 MAR 17
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

FLEX TAKEOFF

Takeoff at reduced thrust, so-called as FLEX takeoff, is permitted only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).
Takeoff at reduced thrust is permitted with any inoperative item affecting the performance only if the associated performance shortfall has been applied to meet the above requirements.
FLEX takeoff is not permitted on contaminated runways.

TFLEX cannot be:
- Higher than TMAXFLEX, equal to ISA + 43 °C.
- Lower than the flat rating temperature (TREF).
- Lower than the actual OAT.

Ident.: LIM-ENG-10-00020230.0005001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

FLEX TAKEOFF

Takeoff at reduced thrust, so-called as FLEX takeoff, is permitted only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).
Takeoff at reduced thrust is permitted with any inoperative item affecting the performance only if the associated performance shortfall has been applied to meet the above requirements.
FLEX takeoff is not permitted on contaminated runways.

TFLEX cannot be:
- Higher than TMAXFLEX, equal to ISA + 72 °C.
- Lower than the flat rating temperature (TREF).
- Lower than the actual OAT.

Ident.: LIM-ENG-10-00020231.0001001 / 17 MAR 17
Applicable to: ALL

DERATED TAKEOFF

Selection of TOGA thrust is not permitted when a derated takeoff is performed, except when requested in any abnormal or emergency procedures.

The use of reduced thrust takeoff (FLEX takeoff) is not permitted in association with derated takeoff.
The use of derated takeoff is permitted regardless of the runway condition (dry, wet, or contaminated).

CROSSWIND OPERATION ON GROUND

Ident.: LIM-ENG-00020232.0002001 / 17 MAR 17
Applicable to: LV-KHT, LV-KHU

Engine crosswind limit at takeoff.. 32 kt (gust included)

SOFT GO-AROUND ◁

Ident.: LIM-ENG-00020233.0001001 / 17 MAR 17
Applicable to: ALL

The use of soft go-around is prohibited with one engine inoperative.

LIMITATIONS

FLIGHT CONTROLS

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LIMITATIONS

FLIGHT CONTROLS

PRELIMINARY PAGES - TABLE OF CONTENTS

Flight Maneuvering Load Acceleration Limits........ A
Maximum Altitude Flaps/Slats Extended........ B
Maximum Flaps/Slats Speeds........ C
Use of Flight Controls........ D

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FLIGHT MANEUVERING LOAD ACCELERATION LIMITS

Ident.: LIM-F_CTL-00020046.0001001 / 17 MAR 17
Applicable to: ALL

Refer to LIM-AG-F_CTL Flight Maneuvering Load Acceleration Limits.

MAXIMUM ALTITUDE FLAPS/SLATS EXTENDED

Ident.: LIM-F_CTL-00020044.0001001 / 17 MAR 17
Applicable to: ALL

Maximum operating altitude with slats and/or flaps extended..20 000 ft

MAXIMUM FLAPS/SLATS SPEEDS

Ident.: LIM-F_CTL-00020047.0001001 / 17 MAR 17
Applicable to: ALL

Refer to LIM-AG-SPD Maximum Flaps/Slats Speeds.

USE OF FLIGHT CONTROLS

Ident.: LIM-F_CTL-00020045.0001001 / 17 MAR 17
Applicable to: ALL

CAUTION	Rapid and large alternating control inputs, especially in combination with large changes in pitch, roll and yaw (e.g. large sideslip angles) may result in structural failures at any speed.

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LIMITATIONS

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LIMITATIONS

FUEL

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Certified Fuel....................A
Fuel Temperature....................B
Maximum Allowed Fuel Imbalance....................C
Minimum Fuel Quantity for Takeoff....................D

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CERTIFIED FUEL

Ident.: LIM-FUEL-00019828.0003001 / 24 OCT 17
Applicable to: ALL

The fuel system is certified with: JET A, JET A1, JET B, JP4, JP5, JP8, N°3 JET, RT and TS-1, in accordance with engine manufacturers and fuel specifications.

Note: *The fuel system has been certified with JET B and JP4, provided that the trim tank is empty and isolated during the entire flight.*

FUEL TEMPERATURE

Ident.: LIM-FUEL-00019837.0003001 / 28 NOV 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

Maximum fuel temperature	:	JET A, JET A1, JP5, JP8, N°3 JET, RT, and TS-1: +55 °C JP4, JET B: +49 °C
Minimum fuel temperature	:	The highest of freezing point +3 °C or -54 °C, in inner tank. Freezing point in outer or trim tank.

If the actual fuel freezing point of the fuel that is used for the flight is not identified, the fuel specification freezing point provided as follows must be used:

JET A	JET A1	JP5	JP8	N°3 JET	TS-1	RT	JP4	JET B
-40 °C	-47 °C	-46 °C	-47 °C	-47 °C	-50 °C	-50 °C	-58 °C	-50 °C

Note: *The various types of fuel can be mixed in all proportions. However, in the case of fuel mixture, the minimum fuel specification values provided in the table above are no longer applicable.*

FUEL TEMPERATURE

Ident.: LIM-FUEL-00019837.0004001 / 28 NOV 17
Applicable to: LV-KHT, LV-KHU

Maximum fuel temperature	:	JET A, JET A1, JP5, JP8, N°3 JET, RT, and TS-1: +55 °C JP4, JET B : +49 °C
Minimum fuel temperature	:	The highest of freezing point or -44 °C below 30 000 ft or -54 °C above 30 000 ft, in inner tank. Freezing point in outer or trim tank.

If the actual fuel freezing point of the fuel that is used for the flight is not identified, the fuel specification freezing point provided as follows must be used:

JET A	JET A1	JP5	JP8	N°3 JET	TS-1	RT	JP4	JET B
-40 °C	-47 °C	-46 °C	-47 °C	-47 °C	-50 °C	-50 °C	-58 °C	-50 °C

Note: *The various types of fuel can be mixed in all proportions. However, in the case of fuel mixture, the minimum fuel specification values provided in the table above are no longer applicable.*

MAXIMUM ALLOWED FUEL IMBALANCE

Ident.: LIM-FUEL-00019833.0001001 / 17 MAR 17
Applicable to: ALL

The following table indicates the maximum allowed wing imbalance at takeoff, in flight, and at landing.

INNER TANKS (OUTER BALANCED)		OUTER TANKS (INNER BALANCED)	
Tank Fuel Quantity (Heavier Tank)	**Maximum Asymmetry**	**Tank Fuel Quantity (Heavier Tank)**	**Maximum Asymmetry**
Full	2 900 kg (6 393 lb)	Full	1 480 kg (3 261 lb)
17 000 kg (37 478 lb)	4 800 kg (10 582 lb)	2 400 kg (5 290 lb)	1 580 kg (3 482 lb)
7 500 kg (16 534 lb)	7 500 kg (16 534 lb)	1 730 kg (3 812 lb)	1 730 kg (3 812 lb)

The variation is linear between these values, and there is no limitation below 7 500 kg (16 534 lb) for inner tanks and 1 730 kg (3 812 lb) for outer tanks.

Note: *In exceptional conditions (i.e. fuel system failure), the above-mentioned values for maximum fuel imbalance may be exceeded without significant effect to the aircraft handling qualities. The aircraft remains fully controllable in all flight phases.*

Note: *For asymmetrically loaded cargo (A330-200F only), refer to the Weight and Balance Manual.*

MINIMUM FUEL QUANTITY FOR TAKEOFF

Ident.: LIM-FUEL-00019840.0003001 / 17 MAR 17
Applicable to: ALL

Minimum fuel quantity for takeoff..5 200 kg (11 461 lb)
The ECAM alerts that are related to fuel low level in the wing tanks (FUEL WING TK LO LVL, etc.) must not appear for takeoff.

LIMITATIONS

ICE AND RAIN PROTECTION

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Definition of Icing Conditions....A
Definition of Severe Ice Accretion....B
Definition of Thin Hoarfrost....C
Rain Repellent ....D
Wipers Maximum Operating Speed....E

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DEFINITION OF ICING CONDITIONS

Ident.: LIM-ICE_RAIN-00020420.0001001 / 12 JUL 18
Applicable to: ALL

- Icing conditions exist when the OAT (on ground or after takeoff) or the TAT (in flight) is at or below 10 °C and visible moisture in any form is present (such as clouds, fog with visibility of 1 sm (1 600 m) or less, rain, snow, sleet or ice crystals).
- Icing conditions also exist when the OAT on the ground and for takeoff is at or below 10 °C and operating on ramps, taxiways or runways where surface snow, standing water or slush may be ingested by the engines, or freeze on engines, nacelles or engine sensor probes.

DEFINITION OF SEVERE ICE ACCRETION

Ident.: LIM-ICE_RAIN-00020421.0001001 / 20 MAR 17
Applicable to: ALL

Ice accretion is considered severe when the ice accumulation on the airframe reaches approximately 5 mm (0.2 in) thick or more.

DEFINITION OF THIN HOARFROST

Ident.: LIM-ICE_RAIN-00020422.0001001 / 20 MAR 17
Applicable to: ALL

Thin hoarfrost is typically a white crystalline deposit which usually develops uniformly on exposed surfaces on cold and cloudless nights.
It is so thin that surface features (lines or markings) can be distinguished beneath it.

RAIN REPELLENT

Ident.: LIM-ICE_RAIN-00020129.0001001 / 17 MAR 17
Applicable to: ALL

The flight crew should only use the rain repellent in the case of moderate to heavy rain.

WIPERS MAXIMUM OPERATING SPEED

Ident.: LIM-ICE_RAIN-00020130.0001001 / 17 MAR 17
Applicable to: ALL

Refer to LIM-AG-SPD Wipers Maximum Operating Speed.

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LIMITATIONS

LANDING GEAR

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LIMITATIONS

LANDING GEAR

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Braking System....A
Brake Temperature....B
Maximum Speeds with the Landing Gear Extended....C
Maximum Tire Speed....D
Nosewheel Steering (NWS)....E
Taxi with Deflated or Damaged Tires....F

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BRAKING SYSTEM

Ident.: LIM-LG-00020191.0001001 / 17 MAR 17
Applicable to: ALL

The braking system is not designed to hold the aircraft in a stationary position when a high thrust level is applied on at least one engine.
During ground procedures that require a thrust increase with braking, the flight crew must ensure that the aircraft remains stationary, and must be ready to immediately retard the thrust levers to IDLE.

BRAKE TEMPERATURE

Ident.: LIM-LG-00020192.0001001 / 17 MAR 17
Applicable to: ALL

Maximum brake temperature for takeoff (brake fans ◁* off)..300 °C

MAXIMUM SPEEDS WITH THE LANDING GEAR EXTENDED

Ident.: LIM-LG-00020195.0001001 / 17 MAR 17
Applicable to: ALL

Refer to LIM-AG-SPD Maximum Speeds with the Landing Gear Extended.

MAXIMUM TIRE SPEED

Ident.: LIM-LG-00020196.0001001 / 17 MAR 17
Applicable to: ALL

Refer to LIM-AG-SPD Maximum Tire Speed.

NOSEWHEEL STEERING (NWS)

Applicable to: ALL

Ident.: LIM-LG-10-00020205.0001001 / 17 MAR 17

For NWS angle limit, *Refer to DSC-20-30 Taxiing*.

Ident.: LIM-LG-10-00020206.0002001 / 17 MAR 17

Braked pivot turn is prohibited (ie. differential braking cannot be used to fully stop one main gear).

Ident.: LIM-LG-10-00020207.0001001 / 17 MAR 17

Asymmetric thrust should be used during the turn, to maintain a continuous speed (between 5 and 10 kt). Some anticipation is required to ensure that asymmetric thrust is available at the beginning of the turn.

Ident.: LIM-LG-10-00020208.0001001 / 17 MAR 17

Towbarless operation on the nose landing gear (towing and pushback) is approved when using the accepted towbarless towing vehicles listed in the Airbus WISE ISI 09.11.00001.

TAXI WITH DEFLATED OR DAMAGED TIRES

Ident.: LIM-LG-00020194.0001001 / 04 DEC 18
Applicable to: ALL

To vacate the runway or taxi at low speed with tire(s) deflated (not damaged), all of the following limitations apply:

- If maximum one tire per gear is deflated (consider three gears)
  Maximum taxi speed during turn............ 7 kt
- If two tires are deflated on the same main gear (maximum one main gear)
  Maximum taxi speed............ 3 kt
  Maximum NWS angle............ 30 °

In addition, if tire damage is suspected, the flight crew must ask for an aircraft inspection prior to vacate the runway or taxi. If the ground crew suspects that a tire burst may damage the landing gear, maintenance action is due.
For more information, *Refer to FCTM/PR-AEP-LG Taxi with Deflated or Damaged Tires*.

LIMITATIONS

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Inertial Reference System (IRS)........A

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INERTIAL REFERENCE SYSTEM (IRS)

Ident.: LIM-NAV-00020158.0001001 / 30 AUG 18
Applicable to: ALL

IR GROUND ALIGNMENT

IR alignment in NAV mode is possible on ground only. Ground alignment of the IRS is possible in latitudes between 82 ° North and 82 ° South.

MAGNETIC (MAG) / TRUE REFERENCE

- **If all ADIRUs have the same magnetic variation table:**

  In NAV mode, the IR will not provide valid magnetic heading and magnetic track angle:
  - North of 73 ° North, between 90 ° West and 120 ° West (magnetic polar region)
  - North of 82 ° North
  - South of 60 ° South.

  When flying at latitudes beyond these limits, the TRUE reference must be selected.

- **If one ADIRU has a different magnetic variation table:**

  In NAV mode, the IR will not provide valid magnetic heading and magnetic track angle:
  - North of 60 ° North, between 30 ° West and 160 ° West
  - North of 75 ° North
  - South of 55 ° South.

  Flying at latitudes beyond these limits is prohibited.

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LIMITATIONS

OXYGEN

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Minimum Flight Crew Oxygen Pressure..........A

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MINIMUM FLIGHT CREW OXYGEN PRESSURE

Ident.: LIM-OXY-00020209.0004001 / 17 MAR 17
Applicable to: LV-GKO, LV-KAN, LV-KAO, LV-KHT, LV-KHU

REF Temperature (1)		**°C**	**-10**	**0**	**10**	**20**	**30**	**40**	**50**
		°F	**14**	**32**	**50**	**68**	**86**	**104**	**122**
MIN Bottle Pressure (PSI) (2)	2 Crewmembers		520	540	560	580	600	620	640
	2 Crewmembers + 1 OBS		660	690	710	740	760	790	810
	2 Crewmembers + 2 OBS		810	850	880	910	940	970	1 000

(1) *REF Temperature:*
- *On ground : REF Temperature = (OAT + Cockpit TEMP) / 2*
- *In flight : REF Temperature = CAB TEMP (°C) - 10 °C, or*
  REF Temperature = CAB TEMP (°F) - 18 °F

(2) *Minimum Bottle Pressure to Cover:*
- *Preflight checks*
- *The use of oxygen, when only one flight crewmember is in the cockpit*
- *Unusable quantity (to ensure regulator operation with minimum pressure)*
- *Normal system leakage*
- *The most demanding case among the following:*
  - *Protection after loss of cabin pressure with mask regulator on NORMAL (diluted oxygen):*
    - *During emergency descent for all flight crewmembers and observers for 15 min*
    - *During cruise at FL 100 for two crewmembers for 105 min.*
  - *Protection against smoke with 100 % oxygen for all flight crewmembers and observers during 15 min at 8 000 ft cabin altitude.*

Note: The above times that are based on the use of a sealed mask may be shorter for bearded crew (in terms of performance, pressure, or duration).

MINIMUM FLIGHT CREW OXYGEN PRESSURE

Ident.: LIM-OXY-00020209.0007001 / 17 MAR 17
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKP

REF Temperature (1)		**°C**	**-10**	**0**	**10**	**20**	**30**	**40**	**50**
		°F	**14**	**32**	**50**	**68**	**86**	**104**	**122**
MIN Bottle Pressure (PSI) (2)	2 Crewmembers		540	560	580	600	620	640	660
	2 Crewmembers + 1 OBS		660	690	710	740	760	790	810
	2 Crewmembers + 2 OBS		810	850	880	910	940	970	1 000

(1) REF Temperature:
- *On ground : REF Temperature = (OAT + Cockpit TEMP) / 2*
- *In flight : REF Temperature = CAB TEMP (°C) - 10 °C, or*
  REF Temperature = CAB TEMP (°F) - 18 °F

(2) Minimum Bottle Pressure to Cover:
- *Preflight checks*
- *The use of oxygen, when only one flight crewmember is in the cockpit*
- *Unusable quantity (to ensure regulator operation with minimum pressure)*
- *Normal system leakage*
- *The most demanding case among the following:*
  - *Protection after loss of cabin pressure with mask regulator on NORMAL (diluted oxygen):*
    - *During emergency descent for all flight crewmembers and observers for 22 min*
    - *During cruise at FL 100 for two crewmembers for 98 min.*
  - *Protection against smoke with 100 % oxygen for all flight crewmembers and observers during 15 min at 8 000 ft cabin altitude.*

Note: The above times that are based on the use of a sealed mask may be shorter for bearded crew (in terms of performance, pressure, or duration).

LIMITATIONS

ROW/ROP

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LIMITATIONS

ROW/ROP

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ROW/ROP...A

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ROW/ROP

Ident.: LIM-ROW_ROP-00016118.0001001 / 30 JUN 20
Applicable to: LV-GHQ, LV-GIF, LV-KAN, LV-KAO

In the case of runways not validated for ROPS in the GPWS database, ROPS is inoperative. It is the operator's responsibility to inform the flight crews about the runways that are not validated for ROPS, along the scheduled route.

The ROPS may be inhibited (TERR pb set to OFF on GPWS panel) when the aircraft position is less than 15 nm from the airfield:
- For specific approach procedures which have previously been identified as potentially producing undue ROW alerts.
- If a NOTAM displaces the landing threshold (shortened LDA).

Operations where the ROW alert landing distance is greater than the LDA must not be conducted unless a specific authorization is obtained from the appropriate authority. For these runways, ROW alerts may be triggered if ROPS is not inhibited (on the GPWS panel, the TERR pb is kept ON).
In the case of a failure that affects landing performance and/or the availability of the thrust reversers, ROPS does not prevent runway excursion.
In any case, if ROPS alerts are triggered, the flight crew must immediately apply the ROPS procedures.

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LIMITATIONS

SURVEILLANCE

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GPWS / Predictive GPWS ◁ .... A

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GPWS / PREDICTIVE GPWS ◁

Ident.: LIM-SURV-00019862.0001001 / 26 NOV 19
Applicable to: ALL

Aircraft navigation must not be based on the use of the terrain display.
The terrain display is intended to serve as a situation awareness tool only, and may not provide the accuracy on which to solely base terrain avoidance maneuvering.

The predictive GPWS ◁ functions should be inhibited (TERR pushbutton to OFF, on the GPWS panel) when the aircraft position is less than 15 NM from the airfield :
- For operations from/to runways not incorporated in the predictive GPWS database.
- For specific approach or departure procedures, which have previously been identified by the operator as potentially causing expected or spurious terrain alerts.

Note: *The decision to inhibit the predictive GPWS ◁ functions must not be based on flight crew judgement only.*

Only aircraft with Man-made Obstacle Function ◁ can display obstacles on ND and trigger alerts, based on a dedicated database which includes artificial obstacles worldwide.

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TEMPORARY
ABNORMAL BEHAVIORS

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TEMPORARY ABNORMAL BEHAVIORS

PRELIMINARY PAGES

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Temporary Abnormal Behaviors Table..A

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TEMPORARY ABNORMAL BEHAVIORS

PRELIMINARY PAGES

SUMMARY OF HIGHLIGHTS

Localization Title	Toc Index	ID	Reason
TAB AUTO FLT - Inadvertent T.O. Speeds Reversion Upon RWY Change	A	1	Documentation update: Addition of "AUTO FLT - Inadvertent T.O. Speeds Reversion Upon RWY Change" documentary unit

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TEMPORARY ABNORMAL BEHAVIORS TABLE

Ident.: TAB-TABT-00024511.0001001 / 05 NOV 20
Applicable to: ALL

The table below provides a list of all Temporary Abnormal Behaviors.

Ident.: TAB-TABT-00024509.0001001 / 05 NOV 20
Applicable to: ALL

System	Temporary Abnormal Behavior	Link

Ident.: TAB-TABT-00024514.0002001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

AUTO FLT	Incorrect MDH after SEC F-PLN Activation (QFE Pin-Programmed Aircraft Only)	*Refer to Link*

Ident.: TAB-TABT-00024524.0002001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

AUTO FLT	Incorrect Management of Speed Constraint for Arrival Procedure Holds	*Refer to Link*

Ident.: TAB-TABT-00024525.0002001 / 05 NOV 20
Applicable to: ALL

AUTO FLT	Erroneous Fuel Predictions in the Case of Descent with Two Altitude Constraints	*Refer to Link*

Ident.: TAB-TABT-00024526.0002001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

AUTO FLT	Severe Reset when the Descent Speed Limit Altitude is Close to an Altitude Constraint	*Refer to Link*

Ident.: TAB-TABT-00024527.0002001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP

AUTO FLT	Undue Reversion to V/S during Climb and Descent	*Refer to Link*

Ident.: TAB-TABT-00024534.0002001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP

AUTO FLT	Incorrect Procedure Turn Trajectory during NPA in Managed Mode	*Refer to Link*

Ident.: TAB-TABT-00024535.0002001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

AUTO FLT	Erroneous Lateral Guidance in NAV Mode with LOC Mode Armed during Approach	*Refer to Link*

Ident.: TAB-TABT-00024536.0002001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

AUTO FLT	Erroneous Trajectory during Procedures with a Turn Direction on a Leg with an Altitude Termination	*Refer to Link*

Ident.: TAB-TABT-00024538.0002001 / 05 NOV 20
Applicable to: ALL

AUTO FLT	No Engagement of the PRESEL SPD TARGET in Climb	*Refer to Link*

Ident.: TAB-TABT-00024539.0002001 / 05 NOV 20
Applicable to: ALL

AUTO FLT	Erroneous Managed Approach Speed after Descend Wind Uplink	*Refer to Link*

Ident.: TAB-TABT-00024540.0006001 / 05 NOV 20
Applicable to: ALL

AUTO FLT	Erroneous Vertical Profile during LOC B/C Approaches with MAP Located before the Runway Threshold	*Refer to Link*

Ident.: TAB-TABT-00024541.0001001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KAN, LV-KAO

AUTO FLT	EOSID F-PLN Limited to 10 LEGS	*Refer to Link*

Ident.: TAB-TABT-00024544.0001001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

AUTO FLT	Optimum Target Speeds Not Updated Following the Automatic Deletion of a Step Climb	*Refer to Link*

Ident.: TAB-TABT-00024545.0002001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO

AUTO FLT	Erroneous Trajectory while in HDG (TRK) Mode during Procedures with a Turn Direction on a Leg with an Altitude Termination	*Refer to Link*

Ident.: TAB-TABT-00024546.0001001 / 05 NOV 20
Applicable to: LV-GKO, LV-GKP, LV-KHT, LV-KHU

AUTO FLT	Erroneous Vertical Guidance in Approach Subsequent to a DIR TO Performed when Near the Top of Descent	*Refer to Link*

Ident.: TAB-TABT-00024547.0002001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AUTO FLT	Erroneous CF Leg Computation Following FMS NEW RUNWAY with LS IDENT Creation	*Refer to Link*

Ident.: TAB-TABT-00024548.0002001 / 05 NOV 20
Applicable to: LV-KHT, LV-KHU

AUTO FLT	Unexpected ILS Auto-Tuning	*Refer to Link*

Ident.: TAB-TABT-00025962.0005001 / 03 NOV 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AUTO FLT	Loss of FMS Predictions in Low Density of Airports	*Refer to Link*

Ident.: TAB-TABT-00024583.0001001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AUTO FLT	Misbehaviour of the Enhanced LOC Capture	*Refer to Link*

Ident.: TAB-TABT-00024587.0001001 / 05 NOV 20
Applicable to: ALL

DATALINK	ATC MSG RECORD NOT RELIABLE - Displayed at ATSU Power-up	*Refer to Link*

Ident.: TAB-TABT-00024698.0001001 / 12 NOV 20
Applicable to: ALL

DOORS	Erroneous Activation of the Cabin Pressure Warning Lights without Residual differential Pressure	*Refer to Link*

Ident.: TAB-TABT-00024605.0004001 / 05 NOV 20
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-GKO, LV-KAN, LV-KAO

ENG	Erroneous Engine Fuel Leak Detection	*Refer to Link*

Ident.: TAB-TABT-00025763.0003001 / 03 MAY 23
Applicable to: LV-FVH, LV-GHQ, LV-GIF, LV-GKO, LV-GKP, LV-KHT

FUEL	Erroneous triggering of the AFT XFR FAULT ECAM Alert during refuelling	*Refer to Link*

1 Ident.: TAB-TABT-00026573.0005001 / 07 FEB 24
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF, LV-KAN, LV-KAO, LV-KHT, LV-KHU

AUTO FLT	Inadvertent T.O. Speeds Reversion Upon RWY Change	*Refer to Link*

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PERFORMANCE (EFB)

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EFB-THR Thrust Ratings

EFB-TOF Takeoff

EFB-IFT In-Flight

EFB-LDG Landing

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LIST OF EFFECTIVE TEMPORARY DOCUMENTARY UNITS

M	Localization	DU Title	DU identification	DU date

No Temporary Documentary Unit

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PERFORMANCE (EFB)

THRUST RATINGS

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EFB-THR-N1 N1 MODE THRUST CONTROL

N1 MODE THRUST CONTROL........A
TAKEOFF N1........B
GO AROUND N1........C
MAXIMUM CONTINUOUS N1........D
MAXIMUM CLIMB N1........E
MAXIMUM CRUISE N1........F

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N1 MODE THRUST CONTROL

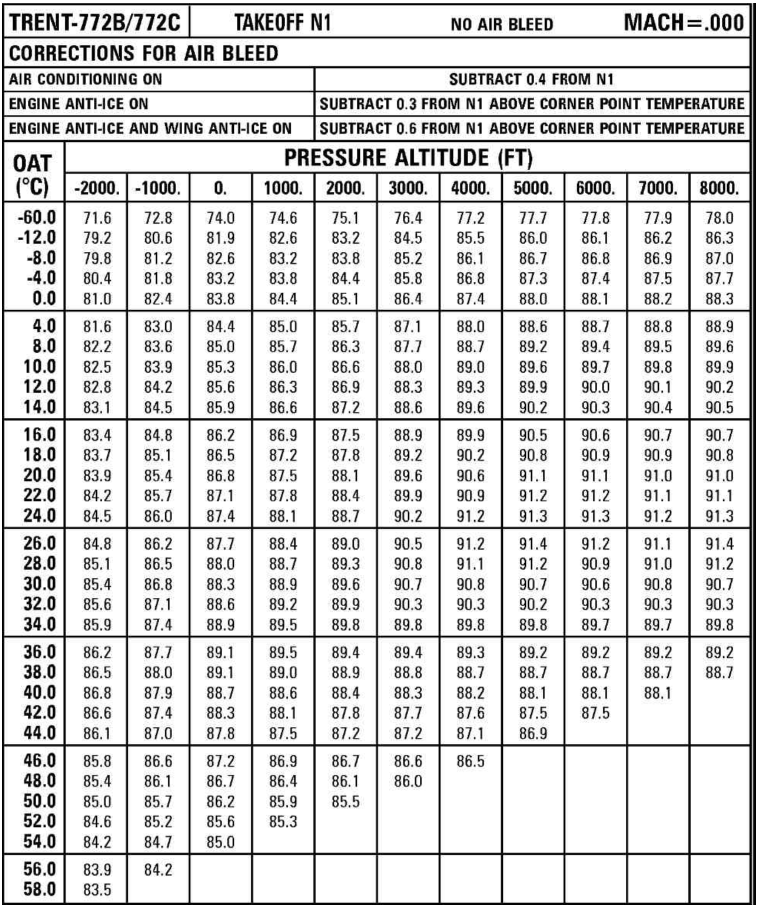
Ident.: EFB-THR-N1-00024012.0002001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU

In case of no EPR available, the thrust control automatically reverts to N1 mode (rated or degraded).
Refer to PRO-ABN-ENG ENG 1(2) EPR MODE FAULT
If the rated N1 mode is lost on all engines, refer to the power management tables given on the following tables.
The herebelow table gives the N1 to be set in cruise to maintain M 0.82

	FLIGHT LEVEL						
WEIGHT (1 000 kg)	**290**	**310**	**330**	**350**	**370**	**390**	**410**
130	72.5	72.2	72.1	72.0	72.3	73.2	74.3
140	72.7	72.5	72.4	72.4	72.9	74.0	75.2
150	73.0	72.9	72.8	72.9	73.6	74.8	76.1
160	73.3	73.2	73.3	73.5	74.3	75.7	77.2
170	73.6	73.6	73.8	74.2	75.1	76.6	78.5
180	74.0	74.1	74.4	75.0	75.9	77.7	80.5
190	74.4	74.6	75.1	75.7	76.8	79.0	83.2
200	74.8	75.2	75.8	76.5	77.9	80.9	
210	75.3	75.8	76.5	77.3	79.2	83.5	
220	75.9	76.5	77.2	78.3	81.0		
230	76.5	77.2	78.0	79.5	83.3		
240	77.2	77.9	78.9	81.1			N1 (%)

TAKEOFF N1

Ident.: EFB-THR-N1-00024013.0002001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU



TRENT-772B/772C	TAKEOFF N1	NO AIR BLEED	MACH=.000

CORRECTIONS FOR AIR BLEED

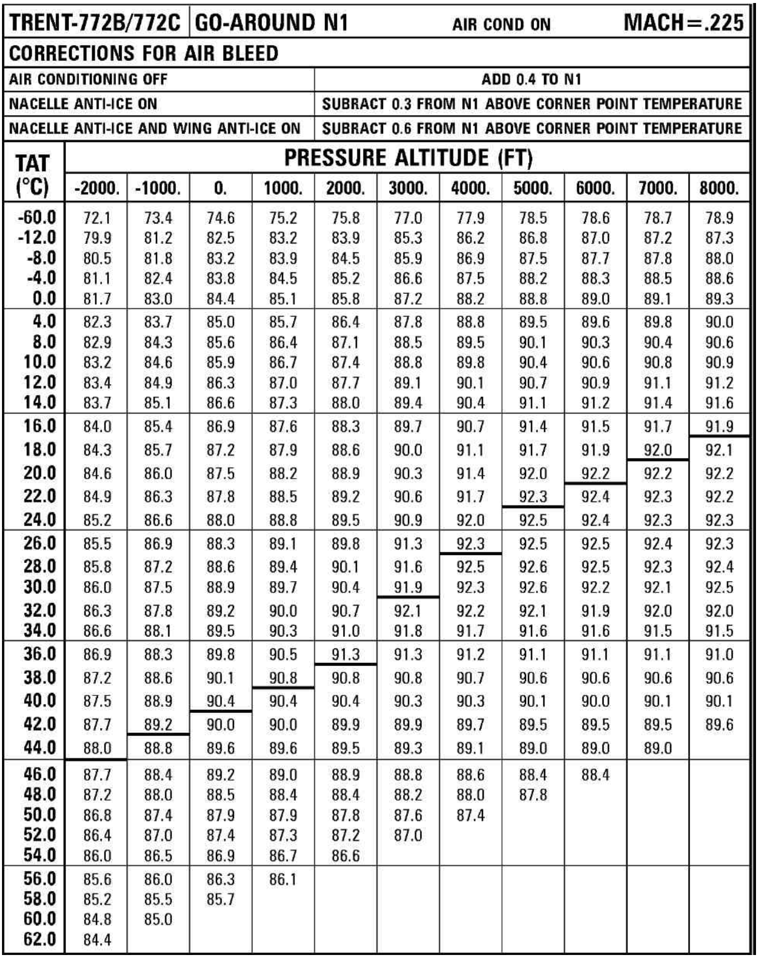
AIR CONDITIONING ON	SUBTRACT 0.4 FROM N1
ENGINE ANTI-ICE ON	SUBTRACT 0.3 FROM N1 ABOVE CORNER POINT TEMPERATURE
ENGINE ANTI-ICE AND WING ANTI-ICE ON	SUBTRACT 0.6 FROM N1 ABOVE CORNER POINT TEMPERATURE

OAT (°C)	PRESSURE ALTITUDE (FT)										
	-2000.	-1000.	0.	1000.	2000.	3000.	4000.	5000.	6000.	7000.	8000.
-60.0	71.6	72.8	74.0	74.6	75.1	76.4	77.2	77.7	77.8	77.9	78.0
-12.0	79.2	80.6	81.9	82.6	83.2	84.5	85.5	86.0	86.1	86.2	86.3
-8.0	79.8	81.2	82.6	83.2	83.8	85.2	86.1	86.7	86.8	86.9	87.0
-4.0	80.4	81.8	83.2	83.8	84.4	85.8	86.8	87.3	87.4	87.5	87.7
0.0	81.0	82.4	83.8	84.4	85.1	86.4	87.4	88.0	88.1	88.2	88.3
4.0	81.6	83.0	84.4	85.0	85.7	87.1	88.0	88.6	88.7	88.8	88.9
8.0	82.2	83.6	85.0	85.7	86.3	87.7	88.7	89.2	89.4	89.5	89.6
10.0	82.5	83.9	85.3	86.0	86.6	88.0	89.0	89.6	89.7	89.8	89.9
12.0	82.8	84.2	85.6	86.3	86.9	88.3	89.3	89.9	90.0	90.1	90.2
14.0	83.1	84.5	85.9	86.6	87.2	88.6	89.6	90.2	90.3	90.4	90.5
16.0	83.4	84.8	86.2	86.9	87.5	88.9	89.9	90.5	90.6	90.7	90.7
18.0	83.7	85.1	86.5	87.2	87.8	89.2	90.2	90.8	90.9	90.9	90.8
20.0	83.9	85.4	86.8	87.5	88.1	89.6	90.6	91.1	91.1	91.0	91.0
22.0	84.2	85.7	87.1	87.8	88.4	89.9	90.9	91.2	91.2	91.1	91.1
24.0	84.5	86.0	87.4	88.1	88.7	90.2	91.2	91.3	91.3	91.2	91.3
26.0	84.8	86.2	87.7	88.4	89.0	90.5	91.2	91.4	91.2	91.1	91.4
28.0	85.1	86.5	88.0	88.7	89.3	90.8	91.1	91.2	90.9	91.0	91.2
30.0	85.4	86.8	88.3	88.9	89.6	90.7	90.8	90.7	90.6	90.8	90.7
32.0	85.6	87.1	88.6	89.2	89.9	90.3	90.3	90.2	90.3	90.3	90.3
34.0	85.9	87.4	88.9	89.5	89.8	89.8	89.8	89.8	89.7	89.7	89.8
36.0	86.2	87.7	89.1	89.5	89.4	89.4	89.3	89.2	89.2	89.2	89.2
38.0	86.5	88.0	89.1	89.0	88.9	88.8	88.7	88.7	88.7	88.7	88.7
40.0	86.8	87.9	88.7	88.6	88.4	88.3	88.2	88.1	88.1	88.1	
42.0	86.6	87.4	88.3	88.1	87.8	87.7	87.6	87.5	87.5		
44.0	86.1	87.0	87.8	87.5	87.2	87.2	87.1	86.9			
46.0	85.8	86.6	87.2	86.9	86.7	86.6	86.5				
48.0	85.4	86.1	86.7	86.4	86.1	86.0					
50.0	85.0	85.7	86.2	85.9	85.5						
52.0	84.6	85.2	85.6	85.3							
54.0	84.2	84.7	85.0								
56.0	83.9	84.2									
58.0	83.5										

Note: *Corner point temperature :*
ISA +22 °C for pressure altitude ≤ 2 000 ft
ISA +15 °C for5 000 ft ≤ pressure altitude ≤ 8 000 ft
linear interpolation in between

GO AROUND N1

Ident.: EFB-THR-N1-00024014.0002001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU



TRENT-772B/772C **GO-AROUND N1** AIR COND ON **MACH=.225**

CORRECTIONS FOR AIR BLEED

AIR CONDITIONING OFF	ADD 0.4 TO N1
NACELLE ANTI-ICE ON	SUBRACT 0.3 FROM N1 ABOVE CORNER POINT TEMPERATURE
NACELLE ANTI-ICE AND WING ANTI-ICE ON	SUBRACT 0.6 FROM N1 ABOVE CORNER POINT TEMPERATURE

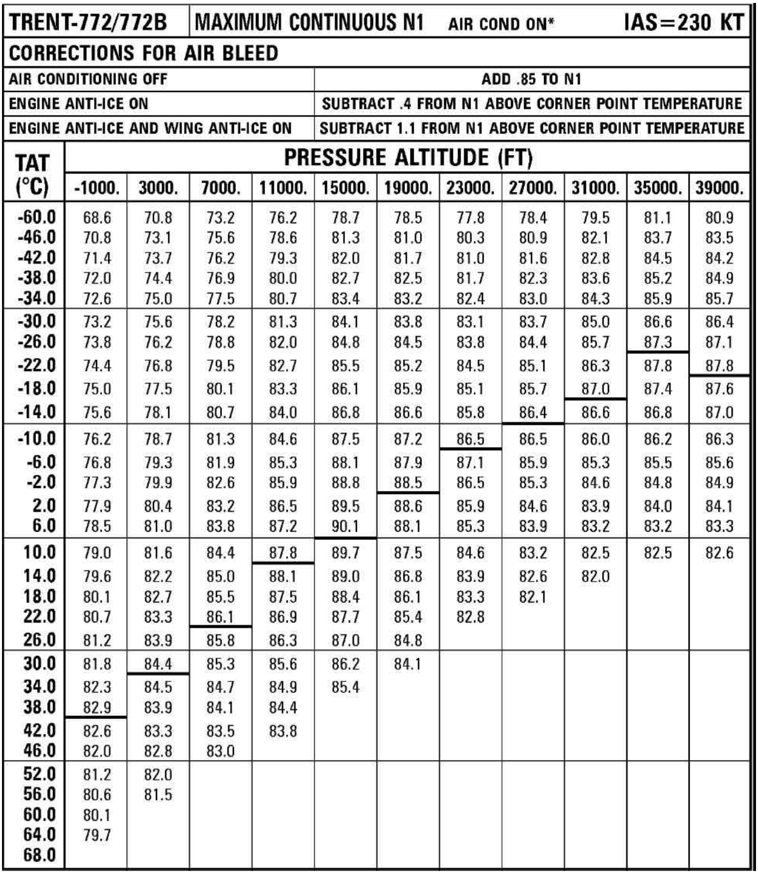
TAT (°C)	PRESSURE ALTITUDE (FT)										
	-2000.	-1000.	0.	1000.	2000.	3000.	4000.	5000.	6000.	7000.	8000.
-60.0	72.1	73.4	74.6	75.2	75.8	77.0	77.9	78.5	78.6	78.7	78.9
-12.0	79.9	81.2	82.5	83.2	83.9	85.3	86.2	86.8	87.0	87.2	87.3
-8.0	80.5	81.8	83.2	83.9	84.5	85.9	86.9	87.5	87.7	87.8	88.0
-4.0	81.1	82.4	83.8	84.5	85.2	86.6	87.5	88.2	88.3	88.5	88.6
0.0	81.7	83.0	84.4	85.1	85.8	87.2	88.2	88.8	89.0	89.1	89.3
4.0	82.3	83.7	85.0	85.7	86.4	87.8	88.8	89.5	89.6	89.8	90.0
8.0	82.9	84.3	85.6	86.4	87.1	88.5	89.5	90.1	90.3	90.4	90.6
10.0	83.2	84.6	85.9	86.7	87.4	88.8	89.8	90.4	90.6	90.8	90.9
12.0	83.4	84.9	86.3	87.0	87.7	89.1	90.1	90.7	90.9	91.1	91.2
14.0	83.7	85.1	86.6	87.3	88.0	89.4	90.4	91.1	91.2	91.4	91.6
16.0	84.0	85.4	86.9	87.6	88.3	89.7	90.7	91.4	91.5	91.7	91.9
18.0	84.3	85.7	87.2	87.9	88.6	90.0	91.1	91.7	91.9	92.0	92.1
20.0	84.6	86.0	87.5	88.2	88.9	90.3	91.4	92.0	92.2	92.2	92.2
22.0	84.9	86.3	87.8	88.5	89.2	90.6	91.7	92.3	92.4	92.3	92.2
24.0	85.2	86.6	88.0	88.8	89.5	90.9	92.0	92.5	92.4	92.3	92.3
26.0	85.5	86.9	88.3	89.1	89.8	91.3	92.3	92.5	92.5	92.4	92.3
28.0	85.8	87.2	88.6	89.4	90.1	91.6	92.5	92.6	92.5	92.3	92.4
30.0	86.0	87.5	88.9	89.7	90.4	91.9	92.3	92.6	92.2	92.1	92.5
32.0	86.3	87.8	89.2	90.0	90.7	92.1	92.2	92.1	91.9	92.0	92.0
34.0	86.6	88.1	89.5	90.3	91.0	91.8	91.7	91.6	91.6	91.5	91.5
36.0	86.9	88.3	89.8	90.5	91.3	91.3	91.2	91.1	91.1	91.1	91.0
38.0	87.2	88.6	90.1	90.8	90.8	90.8	90.7	90.6	90.6	90.6	90.6
40.0	87.5	88.9	90.4	90.4	90.4	90.3	90.3	90.1	90.0	90.1	90.1
42.0	87.7	89.2	90.0	90.0	89.9	89.9	89.7	89.5	89.5	89.5	89.6
44.0	88.0	88.8	89.6	89.6	89.5	89.3	89.1	89.0	89.0	89.0	
46.0	87.7	88.4	89.2	89.0	88.9	88.8	88.6	88.4	88.4		
48.0	87.2	88.0	88.5	88.4	88.4	88.2	88.0	87.8			
50.0	86.8	87.4	87.9	87.9	87.8	87.6	87.4				
52.0	86.4	87.0	87.4	87.3	87.2	87.0					
54.0	86.0	86.5	86.9	86.7	86.6						
56.0	85.6	86.0	86.3	86.1							
58.0	85.2	85.5	85.7								
60.0	84.8	85.0									
62.0	84.4										

Note: *Corner point temperature :*
ISA +22 °C for pressure altitude ≤ 2 000 ft
ISA +15 °C for5 000 ft ≤ pressure altitude ≤ 8 000 ft

linear interpolation in between

MAXIMUM CONTINUOUS N1

Ident.: EFB-THR-N1-00024015.0002001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU



TRENT-772/772B | MAXIMUM CONTINUOUS N1 AIR COND ON* IAS=230 KT

CORRECTIONS FOR AIR BLEED	
AIR CONDITIONING OFF	ADD .85 TO N1
ENGINE ANTI-ICE ON	SUBTRACT .4 FROM N1 ABOVE CORNER POINT TEMPERATURE
ENGINE ANTI-ICE AND WING ANTI-ICE ON	SUBTRACT 1.1 FROM N1 ABOVE CORNER POINT TEMPERATURE

TAT (°C)	PRESSURE ALTITUDE (FT)										
	-1000.	3000.	7000.	11000.	15000.	19000.	23000.	27000.	31000.	35000.	39000.
-60.0	68.6	70.8	73.2	76.2	78.7	78.5	77.8	78.4	79.5	81.1	80.9
-46.0	70.8	73.1	75.6	78.6	81.3	81.0	80.3	80.9	82.1	83.7	83.5
-42.0	71.4	73.7	76.2	79.3	82.0	81.7	81.0	81.6	82.8	84.5	84.2
-38.0	72.0	74.4	76.9	80.0	82.7	82.5	81.7	82.3	83.6	85.2	84.9
-34.0	72.6	75.0	77.5	80.7	83.4	83.2	82.4	83.0	84.3	85.9	85.7
-30.0	73.2	75.6	78.2	81.3	84.1	83.8	83.1	83.7	85.0	86.6	86.4
-26.0	73.8	76.2	78.8	82.0	84.8	84.5	83.8	84.4	85.7	87.3	87.1
-22.0	74.4	76.8	79.5	82.7	85.5	85.2	84.5	85.1	86.3	87.8	87.8
-18.0	75.0	77.5	80.1	83.3	86.1	85.9	85.1	85.7	87.0	87.4	87.6
-14.0	75.6	78.1	80.7	84.0	86.8	86.6	85.8	86.4	86.6	86.8	87.0
-10.0	76.2	78.7	81.3	84.6	87.5	87.2	86.5	86.5	86.0	86.2	86.3
-6.0	76.8	79.3	81.9	85.3	88.1	87.9	87.1	85.9	85.3	85.5	85.6
-2.0	77.3	79.9	82.6	85.9	88.8	88.5	86.5	85.3	84.6	84.8	84.9
2.0	77.9	80.4	83.2	86.5	89.5	88.6	85.9	84.6	83.9	84.0	84.1
6.0	78.5	81.0	83.8	87.2	90.1	88.1	85.3	83.9	83.2	83.2	83.3
10.0	79.0	81.6	84.4	87.8	89.7	87.5	84.6	83.2	82.5	82.5	82.6
14.0	79.6	82.2	85.0	88.1	89.0	86.8	83.9	82.6	82.0		
18.0	80.1	82.7	85.5	87.5	88.4	86.1	83.3	82.1			
22.0	80.7	83.3	86.1	86.9	87.7	85.4	82.8				
26.0	81.2	83.9	85.8	86.3	87.0	84.8					
30.0	81.8	84.4	85.3	85.6	86.2	84.1					
34.0	82.3	84.5	84.7	84.9	85.4						
38.0	82.9	83.9	84.1	84.4							
42.0	82.6	83.3	83.5	83.8							
46.0	82.0	82.8	83.0								
52.0	81.2	82.0									
56.0	80.6	81.5									
60.0	80.1										
64.0	79.7										
68.0											

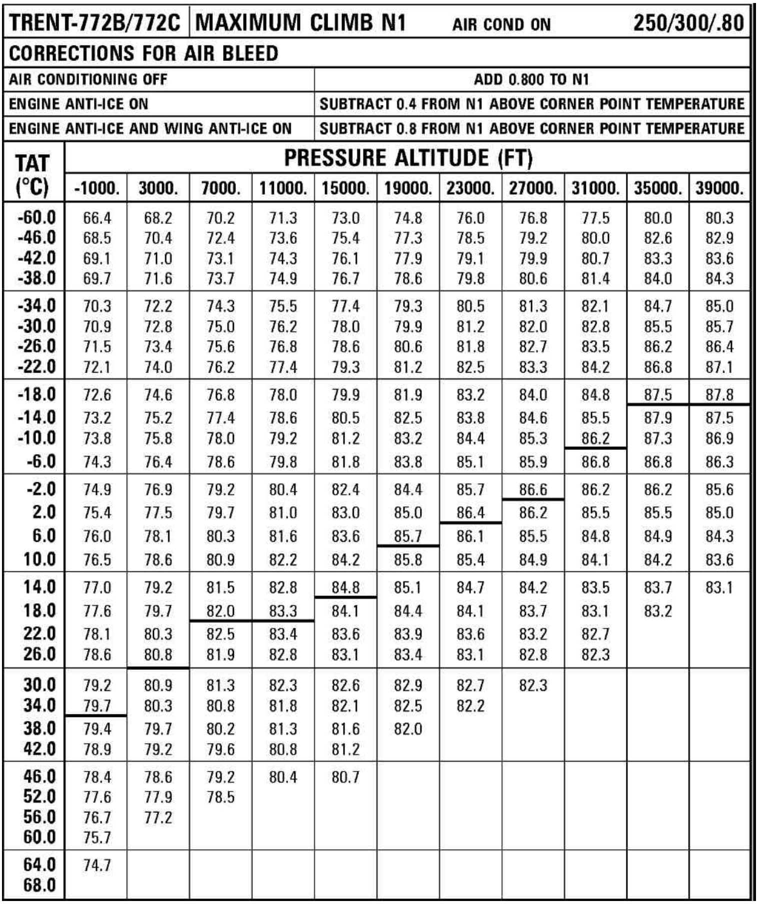
(*) One engine inoperative - 1 pack operative on remaining engine

Note: *Corner point temperature*

Pressure altitude (ft)	≤ 5 000	6 000	7 000	8 000	9 000	≥ 10 000
Corner point temperature (°C)	ISA +15	ISA +14	ISA +13	ISA +12	ISA +11	ISA +10

MAXIMUM CLIMB N1

Ident.: EFB-THR-N1-00024016.0002001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU



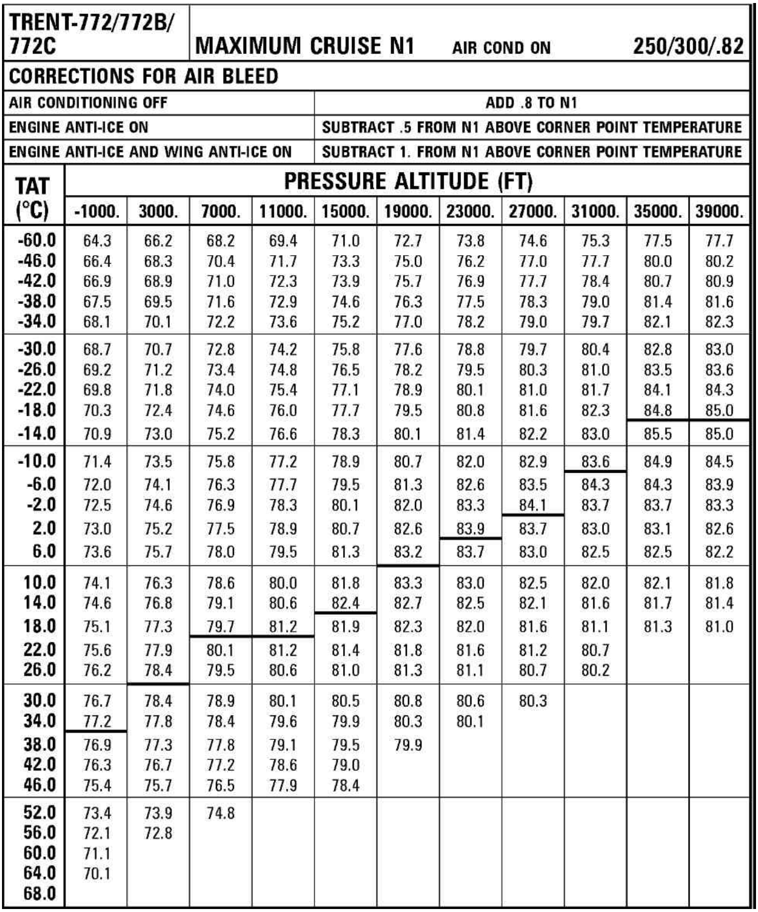
TRENT-772B/772C	MAXIMUM CLIMB N1 AIR COND ON 250/300/.80
CORRECTIONS FOR AIR BLEED	
AIR CONDITIONING OFF	ADD 0.800 TO N1
ENGINE ANTI-ICE ON	SUBTRACT 0.4 FROM N1 ABOVE CORNER POINT TEMPERATURE
ENGINE ANTI-ICE AND WING ANTI-ICE ON	SUBTRACT 0.8 FROM N1 ABOVE CORNER POINT TEMPERATURE

TAT (°C)	PRESSURE ALTITUDE (FT)										
	-1000.	3000.	7000.	11000.	15000.	19000.	23000.	27000.	31000.	35000.	39000.
-60.0	66.4	68.2	70.2	71.3	73.0	74.8	76.0	76.8	77.5	80.0	80.3
-46.0	68.5	70.4	72.4	73.6	75.4	77.3	78.5	79.2	80.0	82.6	82.9
-42.0	69.1	71.0	73.1	74.3	76.1	77.9	79.1	79.9	80.7	83.3	83.6
-38.0	69.7	71.6	73.7	74.9	76.7	78.6	79.8	80.6	81.4	84.0	84.3
-34.0	70.3	72.2	74.3	75.5	77.4	79.3	80.5	81.3	82.1	84.7	85.0
-30.0	70.9	72.8	75.0	76.2	78.0	79.9	81.2	82.0	82.8	85.5	85.7
-26.0	71.5	73.4	75.6	76.8	78.6	80.6	81.8	82.7	83.5	86.2	86.4
-22.0	72.1	74.0	76.2	77.4	79.3	81.2	82.5	83.3	84.2	86.8	87.1
-18.0	72.6	74.6	76.8	78.0	79.9	81.9	83.2	84.0	84.8	87.5	87.8
-14.0	73.2	75.2	77.4	78.6	80.5	82.5	83.8	84.6	85.5	87.9	87.5
-10.0	73.8	75.8	78.0	79.2	81.2	83.2	84.4	85.3	86.2	87.3	86.9
-6.0	74.3	76.4	78.6	79.8	81.8	83.8	85.1	85.9	86.8	86.8	86.3
-2.0	74.9	76.9	79.2	80.4	82.4	84.4	85.7	86.6	86.2	86.2	85.6
2.0	75.4	77.5	79.7	81.0	83.0	85.0	86.4	86.2	85.5	85.5	85.0
6.0	76.0	78.1	80.3	81.6	83.6	85.7	86.1	85.5	84.8	84.9	84.3
10.0	76.5	78.6	80.9	82.2	84.2	85.8	85.4	84.9	84.1	84.2	83.6
14.0	77.0	79.2	81.5	82.8	84.8	85.1	84.7	84.2	83.5	83.7	83.1
18.0	77.6	79.7	82.0	83.3	84.1	84.4	84.1	83.7	83.1	83.2	
22.0	78.1	80.3	82.5	83.4	83.6	83.9	83.6	83.2	82.7		
26.0	78.6	80.8	81.9	82.8	83.1	83.4	83.1	82.8	82.3		
30.0	79.2	80.9	81.3	82.3	82.6	82.9	82.7	82.3			
34.0	79.7	80.3	80.8	81.8	82.1	82.5	82.2				
38.0	79.4	79.7	80.2	81.3	81.6	82.0					
42.0	78.9	79.2	79.6	80.8	81.2						
46.0	78.4	78.6	79.2	80.4	80.7						
52.0	77.6	77.9	78.5								
56.0	76.7	77.2									
60.0	75.7										
64.0	74.7										
68.0											

Note: *Corner point temperature : ISA +10 °C*

MAXIMUM CRUISE N1

Ident.: EFB-THR-N1-00024017.0002001 / 28 MAY 20
Applicable to: LV-KHT, LV-KHU



TRENT-772/772B/772C | **MAXIMUM CRUISE N1** | **AIR COND ON** | **250/300/.82**

CORRECTIONS FOR AIR BLEED

AIR CONDITIONING OFF	ADD .8 TO N1
ENGINE ANTI-ICE ON	SUBTRACT .5 FROM N1 ABOVE CORNER POINT TEMPERATURE
ENGINE ANTI-ICE AND WING ANTI-ICE ON	SUBTRACT 1. FROM N1 ABOVE CORNER POINT TEMPERATURE

TAT (°C)	PRESSURE ALTITUDE (FT)										
	-1000.	3000.	7000.	11000.	15000.	19000.	23000.	27000.	31000.	35000.	39000.
-60.0	64.3	66.2	68.2	69.4	71.0	72.7	73.8	74.6	75.3	77.5	77.7
-46.0	66.4	68.3	70.4	71.7	73.3	75.0	76.2	77.0	77.7	80.0	80.2
-42.0	66.9	68.9	71.0	72.3	73.9	75.7	76.9	77.7	78.4	80.7	80.9
-38.0	67.5	69.5	71.6	72.9	74.6	76.3	77.5	78.3	79.0	81.4	81.6
-34.0	68.1	70.1	72.2	73.6	75.2	77.0	78.2	79.0	79.7	82.1	82.3
-30.0	68.7	70.7	72.8	74.2	75.8	77.6	78.8	79.7	80.4	82.8	83.0
-26.0	69.2	71.2	73.4	74.8	76.5	78.2	79.5	80.3	81.0	83.5	83.6
-22.0	69.8	71.8	74.0	75.4	77.1	78.9	80.1	81.0	81.7	84.1	84.3
-18.0	70.3	72.4	74.6	76.0	77.7	79.5	80.8	81.6	82.3	84.8	85.0
-14.0	70.9	73.0	75.2	76.6	78.3	80.1	81.4	82.2	83.0	85.5	85.0
-10.0	71.4	73.5	75.8	77.2	78.9	80.7	82.0	82.9	83.6	84.9	84.5
-6.0	72.0	74.1	76.3	77.7	79.5	81.3	82.6	83.5	84.3	84.3	83.9
-2.0	72.5	74.6	76.9	78.3	80.1	82.0	83.3	84.1	83.7	83.7	83.3
2.0	73.0	75.2	77.5	78.9	80.7	82.6	83.9	83.7	83.0	83.1	82.6
6.0	73.6	75.7	78.0	79.5	81.3	83.2	83.7	83.0	82.5	82.5	82.2
10.0	74.1	76.3	78.6	80.0	81.8	83.3	83.0	82.5	82.0	82.1	81.8
14.0	74.6	76.8	79.1	80.6	82.4	82.7	82.5	82.1	81.6	81.7	81.4
18.0	75.1	77.3	79.7	81.2	81.9	82.3	82.0	81.6	81.1	81.3	81.0
22.0	75.6	77.9	80.1	81.2	81.4	81.8	81.6	81.2	80.7		
26.0	76.2	78.4	79.5	80.6	81.0	81.3	81.1	80.7	80.2		
30.0	76.7	78.4	78.9	80.1	80.5	80.8	80.6	80.3			
34.0	77.2	77.8	78.4	79.6	79.9	80.3	80.1				
38.0	76.9	77.3	77.8	79.1	79.5	79.9					
42.0	76.3	76.7	77.2	78.6	79.0						
46.0	75.4	75.7	76.5	77.9	78.4						
52.0	73.4	73.9	74.8								
56.0	72.1	72.8									
60.0	71.1										
64.0	70.1										
68.0											

Note: *Corner point temperature : ISA +10 °C*

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PERFORMANCE (EFB)

TAKEOFF

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EFB-TOF-10 Takeoff Performace Optimization

General....A
Takeoff Parameters....B

EFB-TOF-20 Thrust Options

EFB-TOF-20-10 Takeoff at Maximum Thrust

TOGA Thrust....A

EFB-TOF-20-20 Flexible and Derated Takeoff

EFB-TOF-20-20-10 General

General....A

EFB-TOF-20-20-20 Flexible Takeoff

Flexible Takeoff Definition....A
Flexible Takeoff Principle....B
Flexible Takeoff Limitations....C

EFB-TOF-20-20-30 Derated Takeoff (If Installed)

Derated Takeoff Definition....A
Derated Takeoff Principle....B
Derated Takeoff Limitations....C

EFB-TOF-20-20-40 Flexible Takeoff vs Derated Takeoff

Flexible Takeoff vs Derated Takeoff....A

EFB-TOF-30 Runway Conditions

EFB-TOF-30-10 Takeoff on Dry Runway

Description....A
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EFB-TOF-30-20 Takeoff on Wet Runways

Descriptions....A
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EFB-TOF-30-30 Takeoff on Contaminated Runway

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Performance Calculation....B
Restrictions....C

EFB-TOF-40 Takeoff with MEL or CDL Item

Takeoff with MEL or CDL Item....A

Continued on the following page

Continued from the previous page

EFB-TOF-50 Takeoff Recommendations

Takeoff Recommendations....................A

GENERAL

Ident.: EFB-TOF-10-00022661.0001001 / 02 OCT 19
Applicable to: ALL

The takeoff performance optimization is the process which aims at obtaining:
- The maximum performance limited takeoff weight (MTOW (perf))
- The optimum takeoff thrust for a given weight.

The takeoff performance is optimized for a given runway, the associated obstacles, the flaps setting, the prevailing outside conditions (temperature, wind, and QNH) and the aircraft status.

The takeoff performance optimization process:
- Takes into account the parameters that affect takeoff performance
- Optimizes the parameters for which there is a possible range of values or settings

L2 The takeoff performance optimization process is made with the takeoff performance (T.O PERF) application.

TAKEOFF PARAMETERS

Ident.: EFB-TOF-10-00022662.0001001 / 03 NOV 23
Applicable to: ALL

The takeoff performance parameters are:

- The characteristics of the runway:
  - L2 Declared lengths (TORA, TODA, ASDA)
  - Elevation
  - Slope
  - Obstacles.
- L1 The regulatory requirements
- The line up distances as applicable
- The outside conditions:
  - L2 OAT
  - Wind

    Maximum tailwind is limited to a certified value. There is no maximum certified value for headwind, however a headwind higher than 40 kt results in no additional performance credit.
    In accordance with regulation, the computation is based on 150 % of the entered tailwind, and 50 % of the entered headwind.
    A maximum crosswind component is associated with each runway condition.
    For more information on crosswind limitations, *Refer to LIM-AG-OPS Crosswind Takeoff and Landing*.
    In addition, the flight crew applies a different thrust setting technique during the takeoff procedure:

    - In the case of tailwind, or
    - When the crosswind component exceeds a threshold value that may affect the calculation of the takeoff distance depending on the engine model installed on the aircraft.

    For more information on the takeoff procedure, *Refer to PRO-NOR-SOP-12 Takeoff - Thrust Setting*.
  - QNH
  - Runway condition.
- L1 The aircraft configuration:
  - L2 Aerodynamic configuration
  - Air conditioning setting
  - Anti-ice selection
  - Thrust setting.
- L1 The aircraft status:

L2
- MEL items
- CDL items.

L1 - The takeoff speeds:

L2
- V1
- VR
- V2.

L1 The following parameters can be optimized:

- Aerodynamic configuration
- Air conditioning
- Thrust setting:

L2
- TOGA
- FLEX
- Derate levels.

L1 - Takeoff speeds.

L2 From the takeoff performance parameters that can be optimized, the takeoff speeds optimization has the largest effect on the gain of takeoff weight. The range for optimization varies from 0.84 to 1.0 for V1/VR ratio and from 1.13 to 1.4 for V2/VS1G ratio.

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TOGA THRUST

Ident.: EFB-TOF-20-10-00022663.0001001 / 02 OCT 19
Applicable to: ALL

TOGA is the maximum thrust certified for takeoff.
When all engines are operative, the TOGA thrust rating must not be used more than 5 min.
In the case of one engine out, the TOGA thrust rating may be used for a maximum of 10 min.

The flight crew must use TOGA thrust for takeoff if at least one of the following conditions applies:
- Maximum power is required
- Performance reasons
- Flexible takeoff and derated takeoff are not permitted.

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General

GENERAL

Ident.: EFB-TOF-20-20-10-00022664.0001001 / 02 OCT 19
Applicable to: ALL

The actual takeoff weight of the aircraft is often lower than the maximum regulatory takeoff weight. In this case, it may be possible to takeoff at a thrust less than the maximum takeoff thrust. This allows to increase the engine life, improve the engine reliability and reduce the maintenance costs.

Two categories of takeoff at reduced thrust exist:
- The use of flexible temperature concept referred to as flexible takeoff
- The use of a fixed derated thrust level referred to as derated takeoff.

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Flexible Takeoff

FLEXIBLE TAKEOFF DEFINITION

Ident.: EFB-TOF-20-20-20-00022665.0001001 / 02 OCT 19
Applicable to: ALL

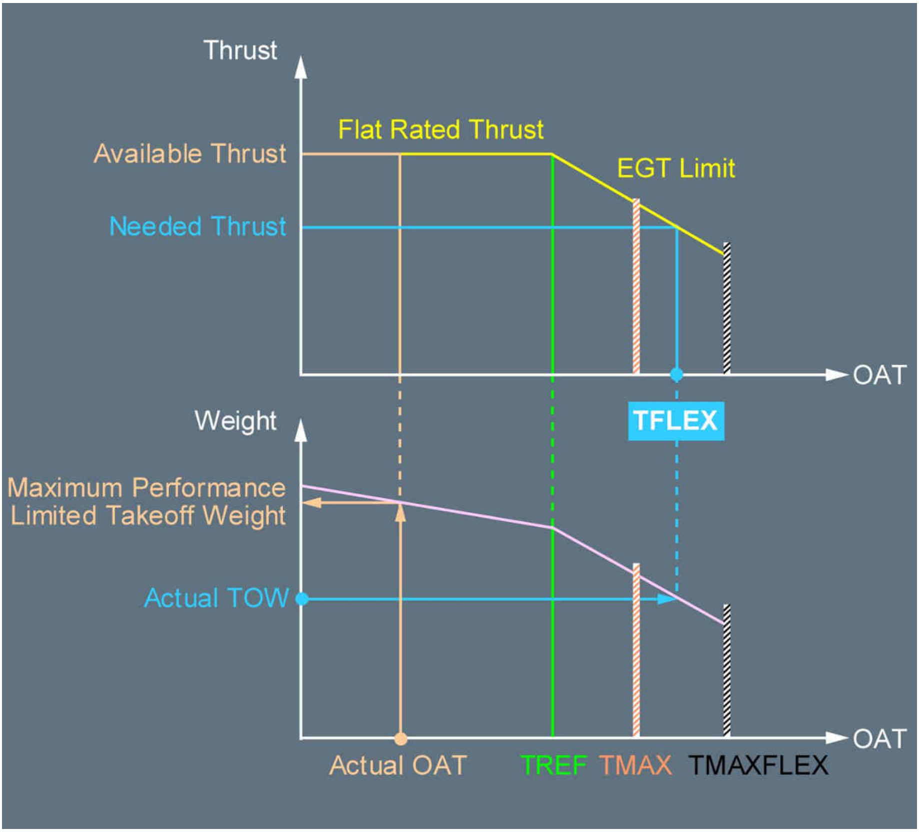
When the actual takeoff weight is lower than the maximum performance limited takeoff weight, the aircraft may comply with the regulatory requirements with a reduced thrust, called flexible takeoff thrust.
This takeoff operation is the FLEX takeoff.

FLEXIBLE TAKEOFF PRINCIPLE

Ident.: EFB-TOF-20-20-20-00022666.0001001 / 02 OCT 19
Applicable to: ALL

The FLEX takeoff principle is based on the change in maximum available thrust with OAT.
The maximum performance limited takeoff weight depends on the maximum available takeoff thrust, therefore it is possible to determine a temperature at which the actual takeoff weight would be limited by performance.
This temperature is referred to as TFLEX (Flex Temperature).

Flexible Takeoff principle


Thrust
Flat Rated Thrust
Available Thrust
EGT Limit
Needed Thrust
OAT
TFLEX
Weight
Maximum Performance
Limited Takeoff Weight
Actual TOW
OAT
Actual OAT
TREF
TMAX
TMAXFLEX

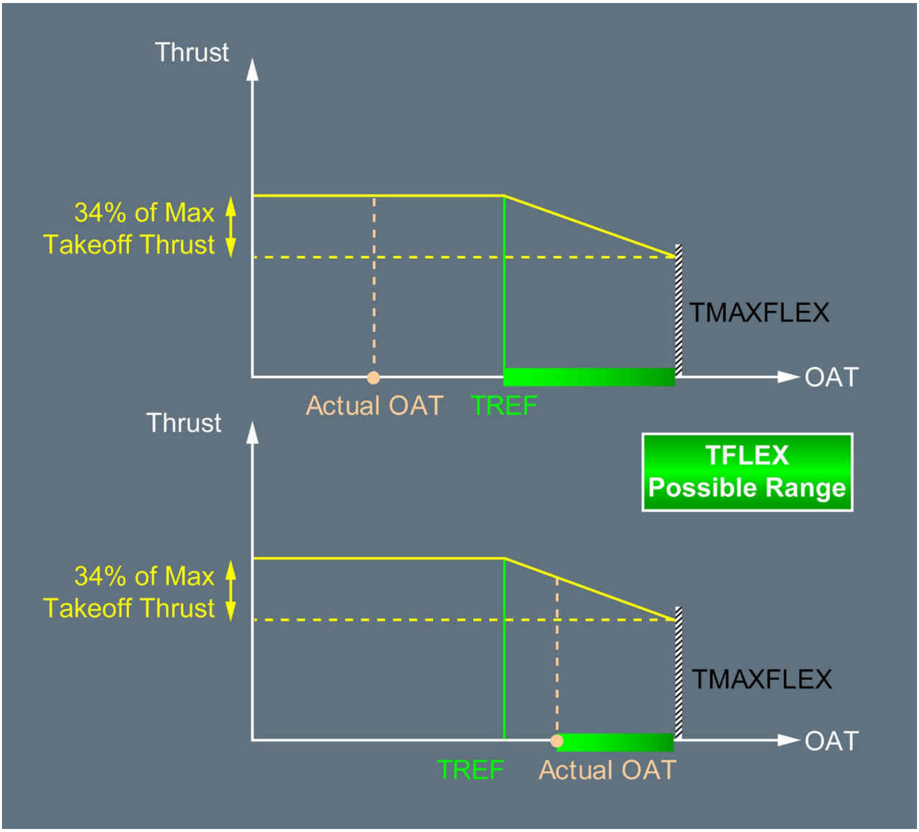
FLEXIBLE TAKEOFF LIMITATIONS

Ident.: EFB-TOF-20-20-20-00022667.0018001 / 05 MAY 22
Applicable to: LV-FVH, LV-FVI, LV-GHQ, LV-GIF

Takeoff at reduced thrust, so-called as FLEX takeoff, is allowed only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

TFLEX cannot be:
- Higher than TMAXFLEX
L2 For more information on TMAXFLEX, *Refer to LIM-ENG Flex Takeoff*.
- L1 Lower than the flat rating temperature (TREF)
- Lower than the actual OAT.

TFLEX Limitations


Thrust
34% of Max Takeoff Thrust
TMAXFLEX
OAT
Actual OAT
TREF
Thrust
TFLEX Possible Range
34% of Max Takeoff Thrust
TMAXFLEX
OAT
TREF
Actual OAT

FLEX takeoff is not permitted on contaminated runways.
Some items listed in the MEL and CDL do not permit a flexible takeoff.

L2 The operator should check the maximum thrust (TOGA) by:

- Performing full-rated takeoffs at regular intervals, in order to detect a reduced EGT margin, or
- Maintaining an adequate engine monitoring program, in order to follow-up on the engine parameters.

FLEXIBLE TAKEOFF LIMITATIONS

Ident.: EFB-TOF-20-20-20-00022667.0016001 / 05 MAY 22
Applicable to: LV-KHT, LV-KHU

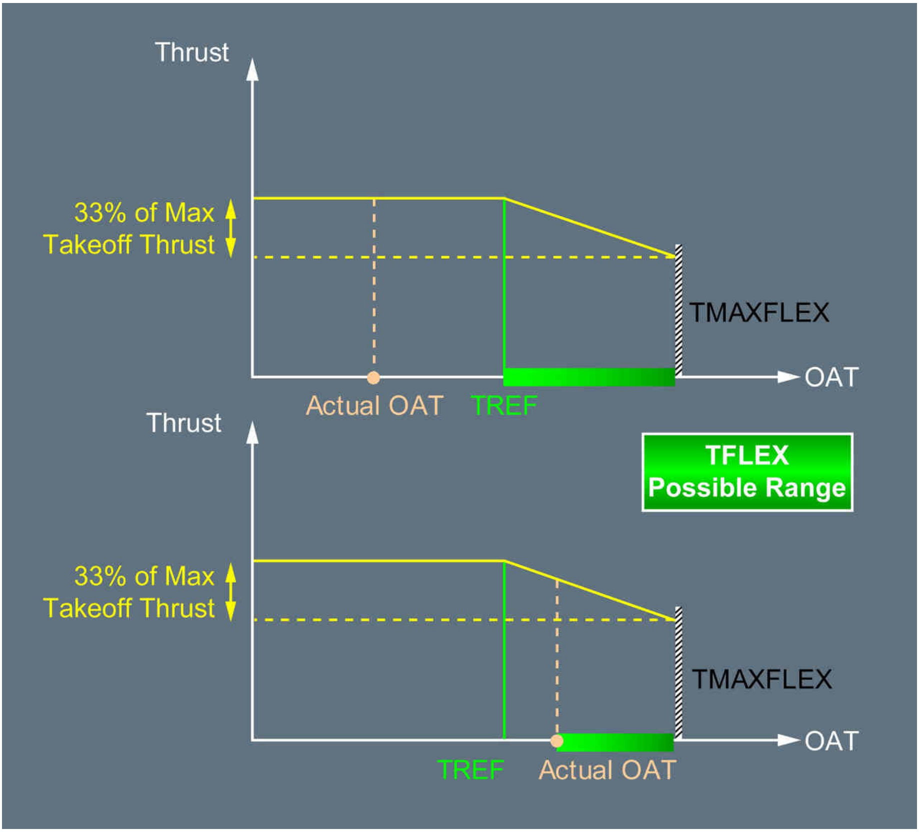
Takeoff at reduced thrust, so-called as FLEX takeoff, is allowed only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

TFLEX cannot be:
- Higher than TMAXFLEX

L2 For more information on TMAXFLEX, *Refer to LIM-ENG Flex Takeoff*.

L1
- Lower than the flat rating temperature (TREF)
- Lower than the actual OAT.

TFLEX Limitations


Thrust
33% of Max
Takeoff Thrust
TMAXFLEX
OAT
Actual OAT
TREF
Thrust
TFLEX
Possible Range
33% of Max
Takeoff Thrust
TMAXFLEX
OAT
TREF
Actual OAT

FLEX takeoff is not permitted on contaminated runways.
Some items listed in the MEL and CDL do not permit a flexible takeoff.

L2 The operator should check the maximum thrust (TOGA) by:

- Performing full-rated takeoffs at regular intervals, in order to detect a reduced EGT margin, or
- Maintaining an adequate engine monitoring program, in order to follow-up on the engine parameters.

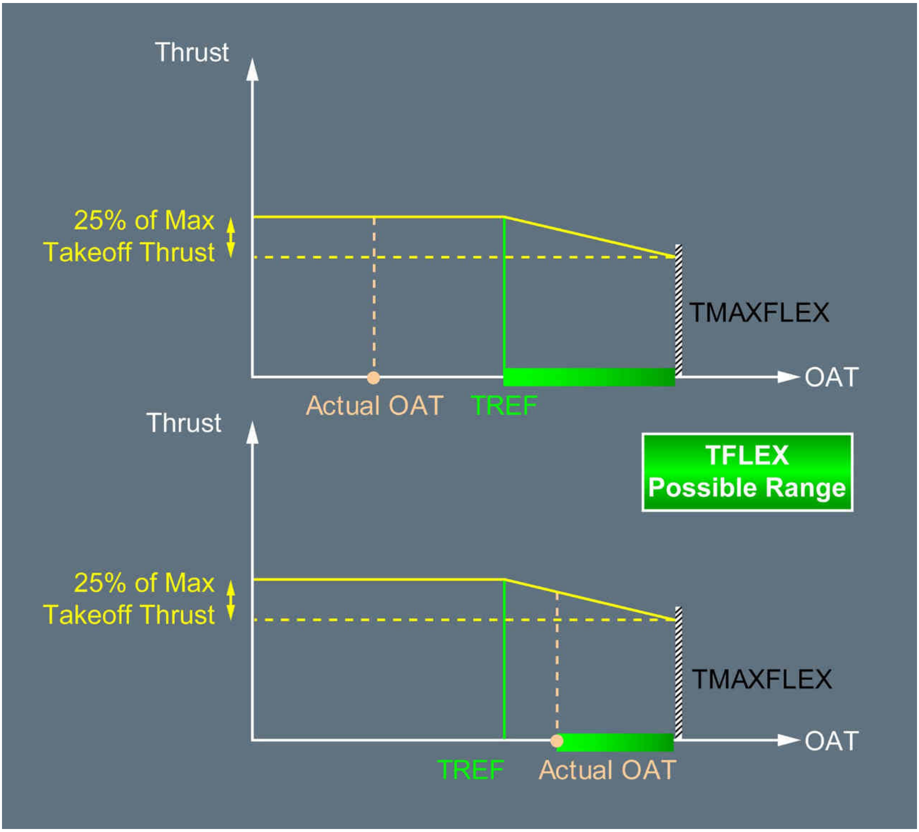
FLEXIBLE TAKEOFF LIMITATIONS

Ident.: EFB-TOF-20-20-20-00022667.0002001 / 05 MAY 22
Applicable to: LV-GKO, LV-GKP, LV-KAN, LV-KAO

Takeoff at reduced thrust, so-called as FLEX takeoff, is allowed only if the airplane meets all performance requirements at the takeoff weight, with the operating engines at the thrust available for the flexible temperature (TFLEX).

TFLEX cannot be:
- Higher than TMAXFLEX
  L2 For more information on TMAXFLEX, *Refer to LIM-ENG Flex Takeoff*.
- L1 Lower than the flat rating temperature (TREF)
- Lower than the actual OAT.

TFLEX Limitations


Thrust
25% of Max
Takeoff Thrust
TMAXFLEX
OAT
Actual OAT
TREF
Thrust
TFLEX
Possible Range
25% of Max
Takeoff Thrust
TMAXFLEX
OAT
TREF
Actual OAT

FLEX takeoff is not permitted on contaminated runways.
Some items listed in the MEL and CDL do not permit a flexible takeoff.

L2 The operator should check the maximum thrust (TOGA) by:

- Performing full-rated takeoffs at regular intervals, in order to detect a reduced EGT margin, or
- Maintaining an adequate engine monitoring program, in order to follow-up on the engine parameters.

Derated Takeoff (If Installed)

DERATED TAKEOFF DEFINITION

Ident.: EFB-TOF-20-20-30-00022668.0001001 / 02 OCT 19
Applicable to: ALL

A derated takeoff is defined as the takeoff operation at a thrust setting lower than TOGA, for which the AFM provides a set of takeoff limitations and performance data.
The N1/EPR values corresponding to each derated takeoff thrust setting are given in the AFM and are considered as a normal takeoff limit.
Six derate levels are defined:
D04, D08, D12, D16, D20 and D24, corresponding to 4, 8, 12, 16, 20 and 24 % decrease from the maximum takeoff thrust.

DERATED TAKEOFF PRINCIPLE

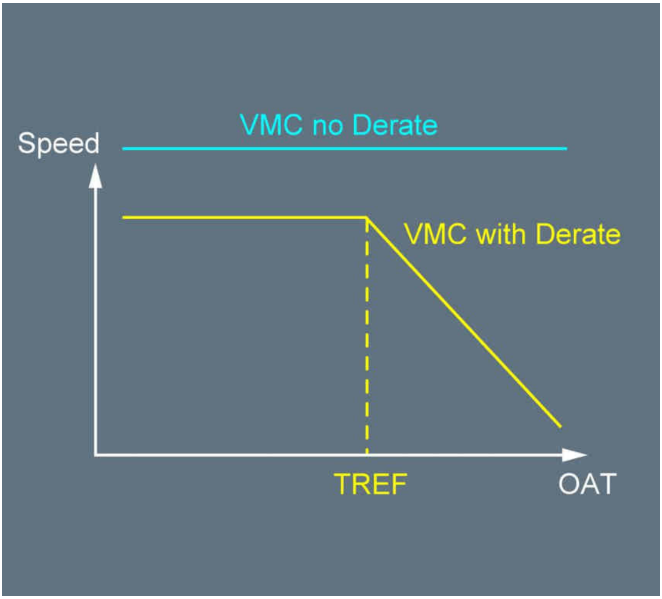
Ident.: EFB-TOF-20-20-30-00022669.0001001 / 02 OCT 19
Applicable to: ALL

The derated takeoff enables to improve the takeoff performance if the TOW is limited by VMCG. VMCG limitation usually occurs on short and/or contaminated runways. The principle is to impose a lower engine rating to benefit from lower minimum control speeds.

L2 In the case of derated takeoff, the minimum control speeds (VMCG and VMCA) are decreased because:

- The derated thrust is lower than the maximum takeoff thrust
- The effect of temperature on maximum available thrust is taken into account.

Derated Takeoff Principle



VMCG LIMITING

VMCG only has an impact on the ASD that includes an acceleration and a deceleration phase. The decrease in VMCG allows to use lower V1 values in the speed optimization, which shortens both the acceleration and the deceleration distances.

The weight decrement linked to the derated thrust is largely compensated by the benefit of shorter ASD. As a consequence, if takeoff performance is limited by the VMCG limited weight, an overall improvement can be achieved by derating.

VMCA LIMITING

The penalizing effect on climb gradient of the decrease in thrust outweighs the advantage of a lower VMCA.
Therefore derated takeoff would not improve the takeoff weight if VMCA limited.

DERATED TAKEOFF LIMITATIONS

Ident.: EFB-TOF-20-20-30-00022670.0001001 / 02 OCT 19
Applicable to: ALL

It is not permitted to combine a derated takeoff and a FLEX takeoff.
When a derated takeoff is performed, the selection of full takeoff thrust, by setting thrust levers to TOGA, is not permitted below the speeds specified in the "Engine Failure After V1 - Continued Takeoff Operating Technique". The only exception is the Recovery Technique at takeoff after the penetration of unforecast windshear.
L2 For more information on the specified speeds, *Refer to FCTM/PR-AEP-ENG Engine Failure after V1*.

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Flexible Takeoff vs Derated Takeoff

FLEXIBLE TAKEOFF VS DERATED TAKEOFF

Ident.: EFB-TOF-20-20-40-00022671.0001001 / 02 OCT 19
Applicable to: ALL

	Flexible Takeoff	Derated Takeoff
Takeoff parameters calculation	TOGA with OAT = TFLEX	Derate level
Thrust level limitations for VMC	TOGA	Derate level
Runway state	Dry and wet only	All
TOGA Selection	Possible at any moment	Possible above F speed
Performance improvement	None	For short and contaminated runways (VMCG limited)
Benefits	Engine life saving	Engine life saving

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DESCRIPTION

Ident.: EFB-TOF-30-10-00022674.0001001 / 28 MAY 20
Applicable to: ALL

A runway is dry when its surface is:
- Free of visible moisture
- Not contaminated.

PERFORMANCE CALCULATION

Ident.: EFB-TOF-30-10-00022675.0001001 / 02 OCT 19
Applicable to: ALL

Takeoff performance is calculated without the benefit of thrust reversers, as per regulation. Flexible takeoff and derated takeoff are allowed for a takeoff from a dry runway.

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DESCRIPTIONS

Ident.: EFB-TOF-30-20-00022676.0001001 / 15 NOV 21
Applicable to: ALL

WET RUNWAY

A runway is considered as wet, when the surface is covered by any visible moisture or water up to and including 3 mm (1/8 in) depth. When the water film does not exceed 3 mm (1/8 in), there is no significant danger of hydroplaning.

Note: 1. *A damp runway is considered wet, regardless of whether or not the surface has a shiny appearance.*
2. *A runway is considered slippery wet when a significant portion of its surface does not comply with the applicable minimum friction criteria.*

PERFORMANCE CALCULATION

Ident.: EFB-TOF-30-20-00022677.0001001 / 15 NOV 21
Applicable to: ALL

Takeoff performance on a wet runway can be calculated with the benefit of thrust reversers.
However, it is not allowed to take off at a weight higher than the weight on dry runway.
Flexible takeoff and derated takeoff are allowed for a takeoff from a wet runway.

L2 For information on contaminants equivalent to wet runway, *Refer to EFB-TOF-30-30 Performance Calculation*.

L1 For runways that have portions declared as slippery wet, performance should be calculated with the Slippery wet runway condition option, or, if not available, Dry snow 10 mm (2/5").

Note: *Flexible takeoff computation is not available for Dry snow 10 mm (2/5").*

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DESCRIPTIONS

Ident.: EFB-TOF-30-30-00022678.0001001 / 15 NOV 21
Applicable to: ALL

A runway is contaminated when a significant portion (depending on the applicable regulation) of its surface is covered with:
- A layer of fluid contaminant not considered as thin
- A hard contaminant.

FLUID CONTAMINANT

In terms of performance, a contaminated runway is a runway covered by a fluid contaminant with a depth of more than 3 mm (1/8 in). The fluid contaminant can be either:
- Dry snow
- Wet snow
- Standing water
- Slush.

Fluid Contaminants reduce friction forces, and cause:
- Precipitation drag
- Hydroplaning.

L2 Fluid contaminants descriptions:
- Dry snow is snow that, if compacted by hand, does not stay compressed when released. The wind can blow dry snow. The density of dry snow is approximately 0.2 kg/l (1.7 lb/US Gal).
- Wet snow is snow that, if compacted by hand, stays compressed when released, and with which snowballs can be created. The density of wet snow is approximately 0.4 kg/l (3.35 lb/US Gal).
- Standing water occurs due to heavy rain and/or not sufficient runway drainage. Standing water has a depth of more than 3 mm (1/8 in).
- Slush is snow soaked with water, which spatters when stepped on firmly. Slush occurs at temperatures of approximately 5 °C, and has a density of approximately 0.85 kg/l (7.1 lb/US Gal).

L1 HARD CONTAMINANT

In terms of performance, a contaminated runway is a runway covered by a hard contaminant that can be either:
- Compacted snow
- Ice (Cold and Dry)
- Wet ice.

Hard contaminants only reduce friction forces.

L2 Hard contaminants descriptions:

- Compacted snow: the maintenance personnel use a snow groomer to compress the snow on a runway in order to obtain a hard surface
- Ice (Cold and Dry): situation in which ice occurs on the runway in cold and dry conditions
- Wet ice: when the ice on a runway melts, or there are loose/fluid contaminants on top of the ice, the ice is referred to as "wet ice". When there is wet ice on a runway, braking and directional control are difficult or not possible, because the runway surface is very slippery.

PERFORMANCE CALCULATION

Ident.: EFB-TOF-30-30-00022679.0001001 / 03 NOV 23
Applicable to: ALL

Takeoff performance on contaminated runways can be calculated with the benefit of thrust reversers. However, it is not allowed to take off at a weight higher than the weight on a dry runway.

For fluid contaminants, takeoff performance data are provided up to the following depths:
- Dry snow: 100 mm (4 in)
- Wet snow: 20 mm (4/5 in)
- Standing water: 13 mm (1/2 in)
- Slush: 13 mm (1/2 in).

Performance computations for depths above the real depth of contamination on the runway may provide results that are better than the real aircraft performance, because of the excess drag that improves the stopping distance. Airbus recommends to retain the takeoff speeds and thrust setting of the lower MTOW (perf) resulting from two computations: one with the depth above the reported depth and one with the depth below.

Note: *The Airbus EFB TAKEOFF PERF application automatically makes this double computation.*

L2 The following assumptions are considered for the calculation:
- The contaminant covers the entire length of the runway in a layer that has a uniform depth and density
- The friction coefficient is based on studies, and verified by tests
- The screen height at the end of the takeoff segment is 15 ft, instead of 35 ft.

L1 Derated takeoff is allowed on contaminated runways.

EQUIVALENCES

In terms of performance:
- A fluid contamination is equivalent to wet, up to a maximum depth of 3 mm (1/8 in) of:
  - Dry snow
  - Wet snow
  - Standing water
  - Slush.
- Frost is equivalent to wet, unless a lower runway performance code is reported
- Compacted snow with OAT above -15 °C is equivalent to Dry snow 10 mm (2/5 in)

  Note: *Compacted snow is appropriate for OAT at or below -15 °C.*

- Dry snow over compacted snow is equivalent to dry snow of appropriate depth
- Wet snow over compacted snow is equivalent to wet snow of appropriate depth.

DOWNGRADE

- **If both the runway condition and the RWYCC inputs are available in the T.O PERF application:**
  The flight crew enters both the downgraded RWYCC and the runway condition to perform the takeoff computation.
- **If only the runway condition is available in the T.O PERF application:**
  - **For a runway covered by a hard contaminant, or a fluid contaminant with a depth of 3 mm (1/8 in) or less:**

    In the case of a downgrade to:
    - RWYCC 4, the flight crew computes the takeoff performance with Compacted snow
    - RWYCC 3, the flight crew computes the takeoff performance with Dry snow 10 mm (2/5 in)
    - RWYCC 2, the computation with any depth of Slush or Standing water may not be conservative. The flight crew should delay the takeoff, or compute the takeoff performance with Ice cold & dry
    - RWYCC 1, the flight crew computes the takeoff performance with Ice cold & dry.
  - **For a runway covered by a fluid contaminant with a depth of more than 3 mm (1/8 in):**
    In the case of any downgrade, the flight crew should delay the takeoff.

RESTRICTIONS

Ident.: EFB-TOF-30-30-00022680.0001001 / 02 OCT 19
Applicable to: ALL

FLEX takeoff is not permitted on contaminated runways.
Dispatch from a runway covered with wet ice is not permitted, unless a specific method for performance assessment has been established by the operator.
Refer to the AFM for further guidance.

TAKEOFF WITH MEL OR CDL ITEM

Ident.: EFB-TOF-40-00022673.0001001 / 02 OCT 19
Applicable to: ALL

The aircraft can be dispatched with deferred MEL or CDL items.

MEL or CDL items that affect takeoff performance are:
- MEL items that reduce braking capabilities (brakes, spoilers, thrust reversers)
- MEL items that have an effect on thrust available (engine anti-ice valve stuck open)
- MEL items that may lead to a reduced systems efficiency (rudder actuator, DFS, EDP)
- CDL items that increase aircraft drag (seals, fairings).

L2 CDL items are divided in two categories: negligible and non-negligible items.
If the number of negligible CDL items is less or equal to three, no penalty applies.
If the number of negligible CDL items is more than three, a drag increase for each item is applied.

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TAKEOFF RECOMMENDATIONS

Ident.: EFB-TOF-50-00022672.0001001 / 02 OCT 19
Applicable to: ALL

TAKEOFF CONFIGURATION

As a general rule, CONF 1+F gives better performance on long runways (better climb gradient), whereas CONF 3 gives better performance on short runways (shorter takeoff distances). Sometimes, other parameters, such as obstacles can interfere. In this case, a compromise between climb and runway performance is requested, making CONF 2 the optimum configuration for takeoff.
Environmental takeoff conditions may also impact the choice of the takeoff configuration.
The following takeoff configuration is then recommended:

OUTSIDE CONDITIONS	FLAPS SETTINGS	OBJECTIVE
Dry or wet, well-paved runway	Use the flaps setting that provides the optimum performance. If takeoff weight is not limited by performance, consider using the higher flaps setting. *Note:* *Corresponds to OPT CONF selection in T.O PERF*	To extend engine life and save maintenance costs
High altitude takeoff	Use CONF 2 or CONF 3	To improve comfort
Badly-paved runway, or accelerate stop distance limited runway	Use CONF 2 or CONF 3	To improve comfort and stopping distance

FLEXIBLE TAKEOFF

Flexible takeoff is the recommended method for takeoff at reduced thrust on dry and wet runways. The highest flexible temperature (TFLEX) extends engine life and saves maintenance costs. However, if a high TFLEX is reduced by a few degrees only, the engines are not significantly affected.
The highest TFLEX will usually be obtained at the lowest flap setting. However, a higher flaps setting provides a lower decision speed (V1) and more comfort.
To extend engine life and to save maintenance costs, the use of flaps setting that provides the highest TFLEX is recommended. However, when the difference (in terms of TFLEX) between two configurations is low, the highest of both takeoff configurations is preferable.

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PERFORMANCE (EFB)

IN-FLIGHT

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EFB-IFT-10 In-Flight Performance Calculation

In-Flight Performance Calculation.......... A

EFB-IFT-20 All Engines Operative Operations

EFB-IFT-20-10 Climb

EFB-IFT-20-10-10 General

General.......... A

EFB-IFT-20-10-20 Climb Thrusts

Derated Climb Thrust.......... A
Maximum Climb Thrust.......... B

EFB-IFT-20-20 Cruise

EFB-IFT-20-20-10 Speeds

Economic Mach Number (ECON Mach).......... A
Long Range Cruise Speed (LRC).......... B
Fixed Speed.......... C
Turbulence Speed.......... D
Maximum Speed.......... E

EFB-IFT-20-20-20 Altitude/Ceilings

Definitions.......... A
Altitude Optimization.......... B

EFB-IFT-20-30 Descent

General.......... A

EFB-IFT-20-40 Holding

General.......... A

EFB-IFT-30 One Engine Inoperative Operations

One Engine Inoperative Strategies.......... A
Long Range Cruise Speed.......... B
EO MAX Altitude.......... C
Holding.......... D

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IN-FLIGHT PERFORMANCE CALCULATION

Ident.: EFB-IFT-10-00022807.0001001 / 02 OCT 19
Applicable to: ALL

Performance data are split by flight phases: climb, cruise, descent, and holding.
In-flight performance calculation is made with the in-flight performance application (IN-FLT PERF).

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General

GENERAL

Ident.: EFB-IFT-20-10-10-00022808.0002001 / 02 OCT 19
Applicable to: ALL

The climb phase starts at the end of takeoff and ends at the initial cruise level.

The available thrust options are:
- DCL: derated climb
- CLB: maximum climb thrust.

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Climb Thrusts

DERATED CLIMB THRUST

Ident.: EFB-IFT-20-10-20-00022809.0001001 / 02 OCT 19
Applicable to: ALL

Derated Climb (DCLB) offers the following economical advantages:
- Increased engine life
- Improved engine reliability
- Reduced direct maintenance costs.

There are two derated climb levels: Derated Climb 1 (DCLB1) and Derated Climb 2 (DCLB2).
The advantages increase, when derate climb levels are high (DCLB2). The disadvantages (i.e. a slight increase in fuel and time) are usually counterbalanced by reduced maintenance costs.
The flight crew must select the applicable derated climb level before takeoff. Airbus recommends that, when possible, DCLB2 be selected. However, operational constraints may require higher thrust levels, and it may not be possible to achieve such thrust levels when DCLB2 is selected. If this is the case, the flight crew should perform the climb with DCLB1 and, if required, with Maximum Climb (MCL).

MAXIMUM CLIMB THRUST

Ident.: EFB-IFT-20-10-20-00022810.0001001 / 02 OCT 19
Applicable to: ALL

The “Maximum Climb” thrust rating is the maximum thrust approved for normal climb.
The FADEC commands this rating when the thrust lever is on the CL detent and the flight crew has selected CLB in the CLB THR list of the FMS ACTIVE/PERF page.

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Speeds

ECONOMIC MACH NUMBER (ECON MACH)

Ident.: EFB-IFT-20-20-10-00022811.0001001 / 02 OCT 19
Applicable to: ALL

COST INDEX

The Cost index (CI) is defined as the ratio between Cost of Time per time unit (CT) and Cost of Fuel per mass unit (CF).
The CI value is expressed in kilograms per minute (kg/min), or hundreds of pounds per hour (100 lbs/hr).
The purpose of the CI concept is to reduce Direct Operating Costs (DOC).

ECON MACH

For a given CI, ECON Mach is defined as the Mach for which DOC are minimum.

LONG RANGE CRUISE SPEED (LRC)

Ident.: EFB-IFT-20-20-10-00022812.0001001 / 02 OCT 19
Applicable to: ALL

The Long Range Cruise speed (LRC) is defined as the Mach number for which the specific range is equal to 99 % of the maximum specific range.
L2 For more information, *Refer to DSC-22_20-40-20 Cost Index (CI)*.

FIXED SPEED

Ident.: EFB-IFT-20-20-10-00022813.0001001 / 02 OCT 19
Applicable to: ALL

The fixed speed is either a Mach or a CAS.

TURBULENCE SPEED

Ident.: EFB-IFT-20-20-10-00022814.0001001 / 02 OCT 19
Applicable to: ALL

Turbulence speeds are recommended when the aircraft flies in a turbulent atmosphere.
For recommended turbulence speed, *Refer to PRO-ABN-MISC [QRH] General*.

MAXIMUM SPEED

Ident.: EFB-IFT-20-20-10-00022815.0001001 / 02 OCT 19
Applicable to: ALL

Maximum speed is either:
- The Maximum Operating Mach (MMO), or
- The Maximum Operating speed (VMO), or
- The speed limited by the available thrust.

L2 For more information on Maximum Speed, *Refer to LIM-AG-SPD Maximum Operating Speed VMO/MMO*.

Altitude/Ceilings

DEFINITIONS

Ident.: EFB-IFT-20-20-20-00022816.0001001 / 02 OCT 19
Applicable to: ALL

OPTIMUM ALTITUDE

The optimum altitude (OPT ALT) is the altitude at which the SR is maximum.

REC MAX

Maximum altitude is defined as the lower of:
- Maximum altitude at maximum cruise thrust in level flight
- Maximum altitude at maximum climb thrust with 300 ft/min vertical speed
- Maximum certified altitude
- 1.3 g buffet limited altitude.

ALTITUDE OPTIMIZATION

Ident.: EFB-IFT-20-20-20-00022817.0001001 / 02 OCT 19
Applicable to: ALL

The optimum altitude definition depends on the cruise type.
The optimum altitude (OPT) displayed on the FMS-PERF page and the optimum altitude (OPTIMUM ALT) determined by the EFB IN-FLT PERF Cruise computation for a given Cost Index (CI) are the result of a minimum cost analysis. To determine these optimum altitudes, both the FMS and IN-FLT PERF calculate the value of the Cost Function (CF) based on the CI. The altitude that provides the lowest value for the CF is displayed as OPT on the FMS-PERF page and as OPTIMUM ALT on the EFB IN-FLT PERF.
These optimum altitude computations take into account a large number of parameters. The FMS and the EFB consider some of these parameters in a different manner. Therefore, OPT on the FMS and OPTIMUM ALT on the EFB may differ.
L2 The main contributor to any difference between OPT on the FMS and OPTIMUM ALT on the EFB is the wind.

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GENERAL

Ident.: EFB-IFT-20-30-00022818.0001001 / 02 OCT 19
Applicable to: ALL

The descent phase starts at the top of descent and ends at landing or level off.
In the case of an emergency descent, MMO/VMO is the best speed profile as it gives high rate of descent, which can be increased by extending the speed brakes, if needed.

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GENERAL

Ident.: EFB-IFT-20-40-00022819.0001001 / 02 OCT 19
Applicable to: ALL

The holding phase, when required, starts before the landing phase above the destination or alternate airport.
In CONF CLEAN, the standard holding speed is the Green dot, as it is a good approximation of the maximum endurance speed.

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ONE ENGINE INOPERATIVE STRATEGIES

Ident.: EFB-IFT-30-00022821.0001001 / 02 OCT 19
Applicable to: ALL

For more information about One Engine Inoperative Strategies, *Refer to FCTM/PR-AEP-ENG Engine Failure during Cruise*.

LONG RANGE CRUISE SPEED

Ident.: EFB-IFT-30-00022822.0001001 / 02 OCT 19
Applicable to: ALL

If the EO mode of the FMS is active, the FMS takes the engine failure into account to compute the EO-LRC speed/ Mach.

EO MAX ALTITUDE

Ident.: EFB-IFT-30-00022823.0001001 / 02 OCT 19
Applicable to: ALL

The FMS Engine Out Maximum (EO MAX) altitude is a precomputed value, function of the aircraft gross weight and DISA, displayed on all the PERF pages if one engine is inoperative.

L2 **EO MAX** altitude respects the following criteria:
- It can be flown with LRC speed
- It can be held in level flight with:
  - The operating engine at "Maximum Continuous Thrust" rating
  - The failed engine in windmilling
  - Anti-ice OFF
- It can be reached before buffeting with a margin of 0.3 g
- It is less than the maximum certified altitude.

HOLDING

Ident.: EFB-IFT-30-00022824.0001001 / 02 OCT 19
Applicable to: ALL

In CONF CLEAN, the standard EO holding speed is the Green dot.

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PERFORMANCE (EFB)

LANDING

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EFB-LDG-10 Landing Performance Calculation

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EFB-LDG-50 In-Flight Performance Assessment

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GENERAL

Ident.: EFB-LDG-10-00022778.0001001 / 15 NOV 21
Applicable to: ALL

The landing performance calculation enables:
- At dispatch, to check that the aircraft can land at destination for the predicted conditions, in compliance with the regulatory requirements
- During flight, to check that the aircraft can land at destination for the actual conditions.

L2 The landing performance calculation is made with the landing performance (LDG PERF) application.

LANDING PARAMETERS

Ident.: EFB-LDG-10-00022779.0001001 / 02 OCT 19
Applicable to: ALL

The landing performance parameters are:

- The characteristics of the runway
  - L2 Landing Distance Available (LDA)
  - Elevation
  - Slope
  - Missed approach gradient.
- L1 The regulatory requirements
- The outside conditions
  - L2 Wind

    L3 As per regulation, the computation is based on 150 % of the entered tailwind, and 50 % of the entered headwind.
    The crosswind component does not affect the calculation of the landing distance. However, a maximum crosswind component is associated with each runway condition.
    For more information about crosswind limitation, *Refer to LIM-AG-OPS Crosswind Takeoff and Landing*.
  - L2 Outside Air Temperature (OAT)
  - Sea level atmospheric pressure (QNH)
  - Icing conditions (anti-ice selection)
  - Runway condition, or landing performance level.
- L1 The aircraft configuration
  - L2 Landing Weight (LW)
  - Aerodynamic configuration
  - Air conditioning setting
  - Aircraft CG position
  - Approach speed and go-around speed.
- L1 The aircraft status.
  - L2 MEL items
  - CDL items
  - Abnormal and emergency configuration (ABN EMER) for in-flight computation only.

L1 The following parameters can be optimized:

- Aerodynamics configuration
- Go-around speed.

L2 For more information about the go-around speed, *Refer to EFB-LDG-20 Landing Speeds*.

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LANDING SPEEDS

Ident.: EFB-LDG-20-00022780.0001001 / 02 OCT 19
Applicable to: ALL

LOWEST SELECTABLE SPEED (VLS)

VLS is the lowest selectable speed. VLS is used to determine the Final Approach Speed (VAPP) in normal conditions.
For more information about VLS, *Refer to DSC-22_10-50-20 Characteristic Speeds*.

REFERENCE SPEED (VREF)

VREF is equal to the VLS of CONF FULL. VREF is used to determine the Final Approach Speed (VAPP) when a system failure affects the landing performance.
For more information about VREF, *Refer to DSC-22_10-50-50 Other Speeds*.

FINAL APPROACH SPEED (VAPP)

VAPP is the speed of the aircraft when crossing the runway threshold. The flaps/slats are in the landing configuration, and the landing gears are extended.
For more information about VAPP, *Refer to DSC-22_10-50-50 Other Speeds*.

GO-AROUND SPEED

In the case of a missed approach, the go-around climb gradient is calculated at the go-around speed.
The standard go-around speed is 1.23 VS1G of the go-around configuration. For approaches with a decision height at or above 200 ft, where approach climb performance is found restrictive, the go-around speed can be increased up to a maximum limit. For more information about maximum go-around acceleration speed, *Refer to AFM/PERF-LDG Approach Climb and Landing Climb*.

LANDING DISTANCES DEFINITIONS

Ident.: EFB-LDG-20-00022782.0001001 / 15 NOV 21
Applicable to: ALL

REQUIRED LANDING DISTANCE

The RLD is the regulatory reference to be used for dispatch landing performance computation.

The RLD is the factored certified landing distance based on:
- Maximum manual braking initiated immediately after main gear touchdown
- Prompt selection of max reverse thrust, maintained to 70 kt, and idle thrust to full stop (when reverse thrust is taken into account)
- Antiskid system and all ground spoilers operative
- The regulatory dispatch factor.

Note: *The RLD calculation considers the effect of the MEL/CDL items that affect the landing performance.*

IN-FLIGHT LANDING DISTANCE

The In-Flight Landing Distance reflects the performance achievable in a typical operational landing without margin.

The In-Flight Landing Distance calculation assumes:
- An airborne phase of 7 s from threshold to touchdown
- In the case of manual braking: maximum manual braking initiated immediately after main gear touchdown
- In the case of autobrake: normal system delays in braking activation
- Antiskid system and all ground spoilers operative
- Prompt selection of max reverse thrust, maintained to 70 kt, and idle thrust to full stop (when reverse thrust is taken into account).

Note: *The In-Flight Landing Distance calculation considers the effect of the inoperative system(s) following:*
- *An MEL/CDL dispatch that affects the landing performance*
- *An in-flight failure (ECAM alert) that affects the landing performance.*

Note: *The In-Flight Landing Distance fulfills the requirements of the Landing Distance at Time of Arrival (LDTA) described in Air Ops AMC1 CAT.OP.MPA.303(e).*

FACTORED IN-FLIGHT LANDING DISTANCE

The definition of the In-Flight Landing Distance does not include any margin. The In-Flight Landing Distance is a realistic distance achievable in nominal conditions, i.e. the actual conditions during the landing are those used for the computation.

It is recommended to apply an appropriate margin to the In-Flight Landing Distance (either determined with or without failure) in order to cover:
- The variability in flying techniques (e.g. flare execution, delay in application of the deceleration means)
- Unexpected conditions at landing (e.g. real runway friction vs. reporting, turbulence, crosswind).

L2 The FLD is defined as:
- The In-Flight Landing Distance multiplied by a Factor, or
- The In-Flight Landing Distance plus an Increment.

L1 It is the airlines responsibility to define the margins (and their applicability) to apply on top of the In-Flight Landing Distance.
The recommended margin is a Factor of 1.15 on the In-Flight Landing Distance. In an emergency situation, the flight crew may decide to disregard this margin.

ROW ◁ LANDING DISTANCE

The ROW ◁ landing distance is calculated below 400 ft based on:
- The detected runway
- The current outside condition (e.g QNH, Temperature…)
- Dry and wet runway conditions
- A realistic manual or automatic landing, normal flare, and de-rotation technique
- Maximum braking
- IDLE REV, when runway condition/braking action is assumed to be DRY-6
- MAX REV, when runway condition/braking action is assumed to be WET-5.

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DRY RUNWAY

Ident.: EFB-LDG-30-00022783.0001001 / 28 MAY 20
Applicable to: ALL

A runway is dry when its surface is:
- Free of visible moisture
- Not contaminated.

WET RUNWAY

Ident.: EFB-LDG-30-00022784.0001001 / 15 NOV 21
Applicable to: ALL

A runway is considered as wet, when the surface is covered by any visible moisture or water up to and including 3 mm (1/8 in) depth. When the water film does not exceed 3 mm (1/8 in), there is no significant danger of hydroplaning.

Note: *1. A damp runway is considered wet, regardless of whether or not the surface has a shiny appearance.*
2. A runway is considered slippery wet when a significant portion of its surface does not comply with the applicable minimum friction criteria.

CONTAMINATED RUNWAY

Ident.: EFB-LDG-30-00022785.0001001 / 03 NOV 22
Applicable to: ALL

A runway is contaminated when a significant portion (depending on the applicable regulation) of its surface is covered with:
- A layer of fluid contaminant not considered as thin
- A hard contaminant.

DESCRIPTION OF FLUID CONTAMINANTS

In terms of performance, a contaminated runway is a runway covered by a fluid contaminant with a depth of more than 3 mm (1/8 in). The fluid contaminant can be either:
- Dry snow
- Wet snow
- Standing water
- Slush.

Fluid Contaminants reduce friction forces, and cause:
- Precipitation drag
- Hydroplaning.

L2 Fluid contaminants descriptions:
- Dry snow is snow that, if compacted by hand, does not stay compressed when released. The wind can blow dry snow. The density of dry snow is approximately 0.2 kg/l (1.7 lb/US Gal).
- Wet snow is snow that, if compacted by hand, stays compressed when released, and with which snowballs can be created. The density of wet snow is approximately 0.4 kg/l (3.35 lb/US Gal).
- Standing water occurs due to heavy rain and/or not sufficient runway drainage. Standing water has a depth of more than 3 mm (1/8 in).
- Slush is snow soaked with water, which spatters when stepped on firmly. Slush occurs at temperatures of approximately 5 °C, and has a density of approximately 0.85 kg/l (7.1 lb/US Gal).

L1 DESCRIPTION OF HARD CONTAMINANTS

In terms of performance, a contaminated runway is a runway covered by a hard contaminant that can be either:
- Compacted snow
- Ice (Cold and Dry)
- Wet ice.

Hard contaminants only reduce friction forces.

L2 Hard contaminants descriptions:
- Compacted snow: the maintenance personnel use a snow groomer to compress the snow on a runway in order to obtain a hard surface
- Ice (Cold and Dry): situation in which ice occurs on the runway in cold and dry conditions
- Wet ice: when the ice on a runway melts, or there are loose/fluid contaminants on top of the ice, the ice is referred to as "wet ice". When there is wet ice on a runway, braking and directional control are difficult or not possible, because the runway surface is very slippery.

L1 LANDING PERFORMANCE CALCULATION

L2 COMPUTATION ASSUMPTIONS

The following assumptions are considered for the calculation:
- The contaminant covers the entire length of the runway
- For fluid contaminants, the landing distance calculation does not take credit of the precipitation drag.

L1 EQUIVALENCES

In terms of performance:
- A fluid contamination is equivalent to wet, up to a maximum depth of 3 mm (1/8 in) of:
  - Dry snow
  - Wet snow
  - Standing water
  - Slush.
- Frost is equivalent to wet, unless a lower runway performance code is reported
- Slippery wet is equivalent to Dry snow
- Compacted snow with OAT above -15 °C is equivalent to Dry snow

  Note: *Compacted snow is appropriate for OAT at or below -15 °C.*

- Dry snow over compacted snow is equivalent to Dry snow
- Wet snow over compacted snow is equivalent to Wet snow.

Note:
- *In the case of a downgraded RWYCC for dispatch computation, Airbus recommends to perform the landing computation with a contaminant included in this RWYCC's category in the RCAM.*
- *In case of a downgraded or upgraded RWYCC, the flight crew should use the recommendations applicable to in-flight performance calculation. For more information, Refer to FCTM/LANDING PERFORMANCE / DOWNGRADED OR UPGRADED RWYCC.*

RESTRICTIONS

For maximum depth of fluid contaminants, *Refer to EFB-LDG-30 Runway Condition Assessment Matrix for Landing*.
Dispatch to a runway covered with wet ice is not permitted, unless a specific method for performance assessment has been established by the operator.
Refer to the AFM for further guidance.

RUNWAY CONDITION ASSESSMENT MATRIX FOR LANDING

Ident.: EFB-LDG-30-00022787.0005001 / 15 NOV 21
Applicable to: ALL

Runway Surface Conditions		**Observations on Deceleration and Directional Control**	**Related Landing Performance**		**Maximum Crosswind for Landing (Gust included)**
Runway State or / and Runway Contaminant	**AIREP**[1]		**RWYCC**	**Level**	
Dry	**-**	-	**6**	**DRY**	45 kt
Damp **Wet** Up to 3 mm (1/8 in) of water **Slush** Up to 3 mm (1/8 in) **Dry snow** Up to 3 mm (1/8 in) **Wet snow** Up to 3 mm (1/8 in) **Frost**	**Good**	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	**5**	**GOOD**	45 kt
Compacted snow OAT at or below -15 °C	**Good to Medium**	Braking deceleration and controllability is between Good and Medium.	**4**	**GOOD TO MEDIUM**	27 kt
Dry snow More than 3 mm (1/8 in), up to 100 mm (4 in) **Wet snow** More than 3 mm (1/8 in), up to 30 mm (6/5 in) **Compacted snow** OAT above -15 °C **Dry snow over compacted snow** **Wet snow over compacted snow** **Slippery wet**	**Medium**	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be reduced.	**3**	**MEDIUM**	20 kt
Standing Water More than 3 mm (1/8 in), up to 13 mm (1/2 in) **Slush** More than 3 mm (1/8 in), up to 13 mm (1/2 in)	**Medium to Poor**	Braking deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	**2**	**MEDIUM TO POOR**	20 kt
Ice (cold & dry)	**Poor**	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional	**1**	**POOR**	15 kt

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Runway Surface Conditions		**Observations on Deceleration and Directional Control**	**Related Landing Performance**		**Maximum Crosswind for Landing (Gust included)**
Runway State or / and Runway Contaminant	**AIREP**(1)		**RWYCC**	**Level**	
		control may be significantly reduced.			
Wet ice **Water on top of Compacted Snow** **Dry Snow or Wet Snow over ice**	**Less than Poor**	Braking deceleration is minimal to non-existant for the wheel braking effort applied. Directional control may be uncertain.	**0**	**-**	-

(1) *AIREP: Special Air Report of Braking Action*

Note: *Refer to FCOM LIM-AFS chapter for Automatic Approach, Landing and Rollout limitations.*

GENERAL

Ident.: EFB-LDG-40-00022788.0001001 / 02 OCT 19
Applicable to: ALL

LANDING PERFORMANCE CALCULATION

The landing performance calculation is made with the landing performance (LDG PERF) application, with the computation type set to DISPATCH.

REQUIREMENT ON THE LANDING DISTANCE

The Landing Distance Available (LDA) at destination must be at least equal to the Required Landing Distance (RLD) for the planned landing weight.

REQUIREMENT ON THE GO-AROUND PERFORMANCE

The go-around climb gradient must be at least equal to:
- 2.1 %
- The gradient published in the airport approach chart.

Note: *EU-OPS requires a minimum go-around climb gradient of 2.5 % for instrument approaches with decision heights below 200 ft.*

DISPATCH ON DRY RUNWAY

Ident.: EFB-LDG-40-00022789.0001001 / 02 OCT 19
Applicable to: ALL

Landing performance is calculated without the benefit of thrust reversers, as per regulation.
L2 For information, the AFM publishes the autoland landing distance increments on dry runways.

DISPATCH ON WET RUNWAY

Ident.: EFB-LDG-40-00022790.0001001 / 02 OCT 19
Applicable to: ALL

Landing performance is calculated without the benefit of thrust reversers, as per regulation.
The RLD for a wet runway is the RLD for the dry runway multiplied by 1.15.

DISPATCH ON CONTAMINATED RUNWAY

Ident.: EFB-LDG-40-00022791.0001001 / 02 OCT 19
Applicable to: ALL

Landing performance can be calculated with the benefit of the thrust reversers.
For operators complying with EU-OPS regulation, the landing weight on a contaminated runway cannot exceed the landing weight on a wet runway.

DISPATCH WITH MEL OR CDL ITEM

Ident.: EFB-LDG-40-00022792.0001001 / 02 OCT 19
Applicable to: ALL

The aircraft can be dispatched with deferred MEL or CDL items. In this case, the LDA must be at least equal to the RLD calculated with the applicable MEL or CDL item selected.

MEL or CDL items that affect landing performance are:
- MEL items that reduce braking capabilities (brakes, spoilers, thrust reversers if applicable)
- MEL items that have an impact on thrust available for go-around (engine anti-ice valve stuck open)
- CDL items that increase aircraft drag (seals, fairings).

L2 CDL items are divided in two categories: negligible and non-negligible items.
If the number of negligible CDL items is less or equal to three, no penalty applies.
If the number of negligible CDL items is more than three, a drag increase for each item is applied.

IN-FLIGHT LANDING DISTANCE CROSSCHECK

Ident.: EFB-LDG-40-00022793.0001001 / 15 NOV 21
Applicable to: ALL

The FLD may, in some cases, and particularly on contaminated runway, exceed the RLD considered at dispatch.
The requirements at dispatch remain unchanged and are based on the RLD. It is however recommended to make a preliminary calculation of the FLD at dispatch. Based on this crosscheck, the crew only need to perform a computation during Descent Preparation in case of changes since dispatch.
If the FLD exceeds the LDA at destination, the Operator may limit the planned weight at destination by the maximum between the RLD and the FLD. The Operator may also consider suitable destination alternates.

ROW ◁ LANDING DISTANCE CROSSCHECK

Ident.: EFB-LDG-40-00023087.0001001 / 28 MAY 20
Applicable to: ALL

The ROW ◁ landing distance may, in some cases, exceed the RLD considered at dispatch.
If the conditions remain unchanged, the flight crew will not be authorized to initiate an approach (unless a specific authorization is obtained from the appropriate authority to deactivate the ROW/ROP ◁).
As a consequence, the dispatch conditions should be adapted in order to prevent a ROW ◁ alert to be triggered.

GENERAL

Ident.: EFB-LDG-50-00022795.0001001 / 15 NOV 21
Applicable to: ALL

During flight, the flight crew performs a landing performance computation if the landing conditions changed compared with the landing performance computation at dispatch, or with a previous computation (e.g. runway, weather conditions, in-flight failure affecting performance, diversion).
The landing performance calculation is made with the landing performance (LDG PERF) application, with the computation type set to IN-FLIGHT.
The landing distance used for this computation is the FLD. The flight crew uses the RCAM to determine the landing performance level.
If the aircraft has been dispatched with deferred MEL or CDL items, the In-Flight Landing Distance and FLD must be calculated with the applicable MEL or CDL items selected.
In an emergency situation, the flight crew may decide to disregard the FLD. In this case the flight crew must check that the In-Flight Landing Distance is shorter than the LDA at the destination or diversion airport.

L2 For more information on In-Flight Landing Distances, *Refer to EFB-LDG-20 Landing Distances Definitions* .

LANDING PERFORMANCE WITHOUT IN-FLIGHT FAILURE

Ident.: EFB-LDG-50-00022796.0001001 / 02 OCT 19
Applicable to: ALL

LANDING PERFORMANCE CALCULATION

The flight crew enters the expected landing conditions and calculates the landing performance.

FLAPS LEVER POSITION

The FLAPS lever position for landing is at flight crew's discretion.

VAPP DETERMINATION

VAPP is calculated by the FMS and is displayed on the APPR panel of the FMS PERF page.

L2 The VAPP is calculated by the FMS as the maximum of:
- VMCL + 5 kt
- 1.23*VS1G + APPR COR

APPR COR is the highest of
- 5 kt in case of A/THR ON
- 5 kt in case of Ice Accretion
- 1/3 Headwind component (excluding gust - maximum 15 kt).

LANDING PERFORMANCE FOLLOWING IN-FLIGHT FAILURE

Ident.: EFB-LDG-50-00022798.0001001 / 02 OCT 19
Applicable to: ALL

LANDING PERFORMANCE ECAM INDICATIONS

After an aircraft system failure that occurs in flight, the flight crew follows the associated ECAM procedure.
When required, the ECAM displays landing performance indications in the applicable procedure.
The ECAM alert items are displayed on the ECAM STATUS page. The ECAM displays LDG DIST PROC APPLY if an ECAM alert item affects landing performance.

LANDING PERFORMANCE CALCULATION

The flight crew enters the ECAM alerts item that affect performance and expected landing conditions in the LDG PERF application to calculate the landing performance.

FLAPS LEVER POSITION

The flight crew selects the FLAPS lever position requested by the ECAM.

Note: *If there are no ECAM instructions, the FLAPS lever position for landing is at flight crew's discretion.*

VAPP DETERMINATION

- **If the ECAM displays LDG DIST PROC APPLY:**
  The flight crew enters into the FMS - PERF - APPR page the VAPP value computed by the LDG PERF application.

ROW ◁ LANDING DISTANCE CROSSCHECK

Ident.: EFB-LDG-50-00022800.0001001 / 28 MAY 20
Applicable to: ALL

The ROW ◁ landing distance may, in some cases, exceed the factored in-flight landing distance.
The flight crew will not be authorized to initiate an approach if a ROW ◁ alert is expected (unless a specific authorization is obtained from the appropriate authority to deactivate the ROW/ROP ◁).
If a ROW ◁ alert is expected, and the flight crew is not authorized to deactivate the ROW/ROP ◁ , the flight crew should request to change the runway, or initiate a diversion.